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Educational Assessment Through Holistic Learning

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Abstract: Educational assessment has long been dominated by instruments designed to rank students on narrow measures of cognitive achievement. This paper argues that such an approach is structurally unable to represent the full range of human learning, and it develops a framework for assessment grounded in holistic learning — an orientation that treats the learner as an integrated whole rather than a container of testable facts. Drawing on the three classical domains of learning (cognitive, affective, and psychomotor), on the philosophy of holistic education, and on a substantial body of meta-analytic evidence on formative assessment, authentic tasks, portfolios, and social-emotional measurement, the paper maps the components of a holistic assessment system and examines the conditions under which it can be implemented. It also confronts the measurement problem directly: holistic appraisal raises genuine questions of validity, reliability, and comparability that cannot be waved away. The paper concludes that holistic assessment is neither a rejection of rigour nor a soft alternative to testing, but a re-specification of what educational quality means — and that its realisation depends on policy alignment, sustained teacher development, and equitable resourcing.

Keywords: holistic learning, formative assessment, learning domains, social-emotional learning

1. Introduction

The arrival of capable large language models and generative systems has produced a period of unusual turbulence in education. Higher education's responses, as Farrelly and Baker observe, "have been varied and fragmented, ranging from those that have rushed to implement full bans on the use of ChatGPT to others who have started to embrace it by publishing student guidance on how to engage with AI effectively and ethically" (Farrelly & Baker, 2023). This fragmentation reflects a deeper uncertainty: institutions are being asked to integrate a technology whose capabilities are expanding faster than the evidence base that would ordinarily inform policy.

1. Introduction

The central problem this paper addresses is a mismatch between what education claims to develop and what it measures. Standardised testing in educational systems worldwide has created a paradigm that prioritises measurable outcomes over holistic learning experiences, failing to capture the complex competencies demanded by twenty-first-century society (C, 2025). Where assessment narrows to choice-response items, what follows is predictable: teaching follows the test rather than the learner.

Holistic learning offers a different starting point. It is concerned with the broadest development of the whole person at the cognitive and affective levels (Mahmoudi et al., 2012), and it resists the fragmentation that characterises conventional curricula by pursuing a connected curriculum of integrative approaches to teaching and learning (Miller, 2019). Contemporary reform discourse has taken up this position explicitly: holistic education integrates cognitive, emotional, social, ethical, and cultural dimensions of learning rather than focusing exclusively on standardised knowledge acquisition (Álvarez, 2026).

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If learning is understood holistically, assessment must be re-specified accordingly. That is the argument of this paper. Section 2 establishes the conceptual foundations of holistic learning. Section 3 critiques the assessment tradition it challenges. Section 4 sets out the domain structure of holistic assessment. Section 5 examines its core components — formative feedback, authentic tasks, portfolios, social-emotional measurement, and competency-based design. Section 6 addresses validity and reliability. Section 7 considers equity. Section 8 discusses implementation and barriers, Section 9 reviews the empirical evidence, and Section 10 concludes.

2. Conceptual Foundations of Holistic Learning

2.1 Historical and philosophical roots

Holistic education is not a recent innovation. The holistic approach entered the literature in the 1980s, when the Canadian scholar John P. Miller published The Holistic Curriculum (Güçlü, 2023). Miller's work addressed the problem of fragmentation in education directly, proposing integrative approaches to teaching and learning that connect disciplinary knowledge to the learner's wider experience (Miller, 2019). His thought rests on two conceptual pillars: wholeness and community, with the former emphasising the harmonious development of the inner and outer dimensions of the person and the latter extending education outward toward classroom, school, local, and global communities (Myung, 2022).

Earlier still, a generation of humanistic educational theorists in the mid-twentieth century built their work around the comprehensive concept of the complete development of an individual, attending to intellectual capabilities, social skills, creative potential, aesthetic appreciation, moral sensibilities, and personal values (Cao et al., 2024). Holistic education, in this lineage, is best understood not as a technique but as a paradigm — a set of basic assumptions and principles that can be applied in diverse ways (Mahmoudi et al., 2012).

2.2 Defining holistic learning for assessment purposes

For assessment design, three features of holistic learning matter most.

First, integration across domains. Holistic learning treats cognition, affect, and action as interdependent rather than as separate tracks. This has direct assessment consequences, because an instrument that samples only one domain will systematically misrepresent the learner.

Second, interconnectedness of experience. A main element of holistic education is its focus on the interconnectedness of experience and reality (Mahmoudi et al., 2012) — which implies that assessment tasks should be situated rather than decontextualised.

Third, creativity and process. Educating the whole person has become a central priority in contemporary educational reform, emphasising creativity, holistic development, and the cultivation of competencies for an uncertain and challenging future (Álvarez, 2026). Aligning curriculum, assessment, and quality assurance with those purposes requires performance tasks and reflective activities that capture process, originality, and collaboration (Álvarez, 2026).

3. What Holistic Assessment Is Responding To

The critique that motivates holistic assessment is well documented. Traditional frontal instruction for learning facts, assessed through short-answer or multiple-choice tests, constitutes what has been called a testing culture — decontextualised, psychometrically designed items in a choice-response format, used summatively to differentiate and rank students (Gulikers et al., 2004). Traditional assessment of this kind is product oriented, evaluating subject knowledge by comparison against standards or against other learners (Sandra et al., 2023).

The consequences of high-stakes testing for curriculum are extensively reported. Teachers frequently teach to the test, limiting the curriculum to the anticipated assessed content (Mirza et al., 2023); one study found that teachers relied significantly on examination-related resources, dedicating roughly two-thirds of their teaching time to them (Mirza et al., 2023). Teachers emphasise what is essential for tests, leaving aside content important for developing twenty-first-century skills, and test-driven instruction tends to limit the curriculum by minimising the content of the untested curriculum (Nahar, 2023). It has been suggested for well over a hundred years that the use of tests tends to narrow the curriculum and that what is tested is what gets taught (Green, 2013). Critics have noted that evaluating teachers by the rise or fall of their students' test scores encourages teaching to multiple-choice tests and narrowing the curriculum only to the tested subjects (Jensen et al., 2017).

The assessment implication is not that tests are worthless but that their selection logic has costs. No test can hope to eliminate the twin threats to validity of construct irrelevance and construct under-representation (Green, 2013), and where construct under-representation is severe, the score no longer supports the inferences users wish to draw from it.

4. The Domain Structure of Holistic Assessment

Holistic assessment is most tractable when it is organised around the domains of learning that holistic education itself seeks to develop.

Assessment does not focus solely on the cognitive domain, which encompasses knowledge and understanding of subject matter, but also includes the affective domain related to students' attitudes, motivation, and values demonstrated during learning, as well as the psychomotor domain that evaluates practical skills (Ridho et al., 2025). The cognitive domain focuses on knowledge acquisition, comprehension, application, analysis, synthesis, and assessment; the affective domain delves into emotions, attitudes, and values that influence motivation and engagement; and the psychomotor domain encompasses physical movements, coordination, and motor skills development (Subedi, 2022). Integrating all three is presented as necessary to cater to diverse learning modalities and styles and to create a dynamic and inclusive learning environment that fosters critical thinking, emotional resilience, and practical skills (Subedi, 2022).

A complementary taxonomy-level treatment emphasises that the cognitive domain prepares students to analyse, synthesise, and evaluate information; the affective domain focuses on emotional intelligence, resilience, collaboration, and visionary thinking; and the psychomotor domain enhances sensory perception, cognitive-motor integration, feedback responsiveness, and precision through physical action (AlAfnan, 2025). Crucially, integrating such a framework into educational practice requires strategic alignment of instructional methods and assessment approaches tailored to each domain's objectives, drawing on inquiry-based learning, collaborative projects, experiential activities, and reflective practices (AlAfnan, 2025).

A practical caution follows from this structure. Assessment of learning domains practised in many higher education programmes has resulted in vague assessment methods and, as a result, failed to show concrete continual quality improvement (Kasilingam et al., 2014). The remedy proposed in that literature is to assess cognitive, affective, and psychomotor behaviours individually, using reliable and valid assessments that discriminate between assessing skills, knowledge, and attitudes (Kasilingam et al., 2014). The Indonesian framework examined by Ridho and colleagues makes the same demand: integrated assessment should rest on valid, reliable, and objective assessment instruments so that evaluation results accurately and pedagogically accountably reflect students' learning achievement (Ridho et al., 2025).

5. Core Components of Holistic Assessment Practice

5.1 Formative assessment and feedback

Formative assessment is the component of holistic assessment with the strongest empirical base. An umbrella review of thirteen meta-analyses examining the effects of formative assessment on learning in K-12 students found that formative assessment produced trivial to large positive effects on student learning, with no negative effects identified (Sortwell et al., 2024). The authors nonetheless caution that the certainty of the underlying evidence is limited: across the included meta-analyses, the robustness of the evidence was rated very low, low, or moderate (Sortwell et al., 2024).

The magnitude of effects varies by design. A systematic review of thirty-three studies representing twenty-five research projects in US K-12 education, analysing 126 effect sizes, found an overall small-sized positive effect of formative assessment on student learning (d = .29), with benefits for mathematics (d = .34), literacy (d = .33), and arts (d = .29) (Lee et al., 2020). Two features strengthened effectiveness: supporting student-initiated self-assessment (d = .61) and providing formal formative assessment evidence through a medium-cycle length (d = .52) (Lee et al., 2020).

Evidence from other systems is broadly consistent but heterogeneous. A meta-analysis of Turkish studies covering thirty-two studies and forty-seven effect sizes obtained an overall mean effect size of .72, with student-initiated formative feedback (d = 1.16) and mixed feedback (d = .83) producing large effects, followed by adult-initiated feedback (d = .69) and a small effect for computer-initiated feedback (d = .42) (Karaman, 2021). A worldwide meta-analysis analysing 258 effect sizes from 118 primary studies confirmed the usefulness of formative assessment with an overall effect size of 0.25 for all included studies and 0.22 for studies conducted within the US (Yao et al., 2024).

In higher education the picture is thinner. A systematic review of causal evidence on feedback and formative assessment found that low-stakes quizzing is a particularly powerful approach and that there are benefits for forms of peer and tutor feedback, though these depend on implementation factors, with mixed evidence for praise, grading, and technology-based feedback (Morris et al., 2021).

5.2 Authentic and performance-based assessment

Holistic learning's emphasis on situated, integrated competence translates into assessment that requires performance rather than recall. Authentic assessment involves tasks that mirror real-life situations, requiring students to analyse, evaluate, and create rather than simply recall information (Jacob, 2026). Where traditional assessment is product oriented, authentic assessment is process oriented, evaluating proficiency by asking students to perform real-life tasks (Sandra et al., 2023). Its advantage is diagnostic richness: it gives more information about students' strengths, weaknesses, needs, and preferences, which can assist in adjusting instruction (Sandra et al., 2023).

The alignment argument is important here. Current educational goals focus more on the development of competent students than on simple knowledge acquisition, and the corresponding assessment procedure is contextualised, interpretative, and performance assessment aimed at higher-order thinking processes and competencies rather than factual knowledge and basic skills (Gulikers et al., 2004). Where the aim is critical thinking, problem-solving, and decision-making, authentic tasks allow students to explore multiple perspectives and develop creative solutions in ways that structured, time-limited tests do not (Jacob, 2026).

5.3 Portfolio assessment and reflection

Portfolios operationalise the reflective dimension of holistic learning. In a qualitative study with education students, portfolios not only fostered student agency and autonomy but also strengthened self-responsibility and promoted deeper engagement with the learning process, while facilitating a more dynamic, transparent, and collaborative

relationship between students and instructors (Santos, 2024). Portfolio assessment has been argued to productively foster self-regulated learning in writing classrooms through iterative feedback processes (Lam, 2013).

The mechanism is well theorised. In Zimmerman's model of self-regulated learning, the self-reflection stage consists of self-judgment and self-reaction, and portfolio work maps directly onto this dual process (Kong et al., 2024). The processes of planning, documenting, and reflecting on individual learning activities are core to the portfolio approach, which reframes assessment as an example of a shift from teacher-based instruction to student-centred learning (Gläser-Zikuda et al., 2018). Sustainable assessment scholarship goes further, arguing that a portfolio in which students select and annotate evidence from practice, and reflect on that evidence, is a powerful tool for the development of reflective practice (Boud & Soler, 2015).

5.4 Social-emotional learning assessment

Because holistic learning treats the affective domain as constitutive rather than decorative, the measurement of social and emotional competence is integral to the framework. Although policies and programmes designed to support the development of student competencies have advanced significantly, less work has been done to develop methods of assessing student social and emotional competence (McKown, 2019).

The instrument landscape is maturing. A systematic review identified 25 unique assessments over a 20-year period measuring social and emotional skills for students in elementary through secondary education, and its results demonstrate the direct influence of the CASEL framework, concluding that a combination of multi-method and multi-informant assessment should be employed to assess social and emotional skills effectively (Martinez-Yarza et al., 2023). There is also a persistent supply-demand gap: the implementation of SEL curricula outpaces the development of assessments through which social and emotional skills can be measured (Walton et al., 2022).

Two design principles follow from the evidence base. First, teachability matters for legitimacy: evidence clearly establishes that most social and emotional skills are teachable and thus able to be improved through deliberate educational interventions (OECD, 2024). Second, use must be defensible: effective SEL assessment is necessary for enhancing educational outcomes, understanding the impact of SEL programmes, and improving instructional practices, which places obligations on educators, researchers, and policymakers to establish standards and best practice (Fun, 2025).

5.5 Competency-based design

Holistic assessment converges with competency-based education, which specifies what learners should be able to do and assesses performance against those specifications. Essential competencies such as collaboration and critical thinking, integral to long-term success, have been notably absent from traditional curricula, as instructional materials largely focus on disciplinary domains (Ober et al., 2025). The "4Cs" — creativity, critical thinking, collaboration, and communication — have become a focal point for assessment design at both individual and institutional levels (Thornhill-Miller et al., 2023).

Competency-based models also permit assessment of skills in ways that conventional deadlines do not: an online competency-based curriculum should provide students the opportunity to demonstrate a skill at any given moment during the programme rather than on a predetermined deadline, with strategies including the creation of an e-portfolio or filming oneself performing a skill (Sistermans, 2020). Personalised monitoring of progress has been proposed as a means of implementing competency-based education at the primary level (Ponomariovienė et al., 2025). The synthesis of holistic assessment practice is recognisable in these designs: formative feedback, competency-based evaluations, and

technology-based, continuous, personalised learning are identified as essential features of holistic assessment (Ravirala, 2026).

6. Validity, Reliability, and the Measurement Problem

Holistic assessment cannot claim to be rigorous unless it engages with psychometric criticism. Reliability and validity are interconnected: to the extent that assessments are unreliable, the validity of any inference drawn from an appraisal is weakened (Sadler, 2008). The comparative validity of analytic and holistic appraisals is not axiomatic — the two approaches differ in the processes they apply, and their equivalence cannot be taken for granted (Sadler, 2008).

Assessment for learning faces a sharper version of the same challenge. One critique argues that in assessment for learning much of the inferential process about what to pay attention to, how to interpret it, and what response to make is located in the mind of the teacher, and that assessment for learning does not meet the standards implied by validity expectations of systematic evidence gathering about learning (Brown, 2019). A more conciliatory position holds that since assessment for learning is practised through teachers' and students' judgment, dependability rests on the reliability of teachers' assessments — on whether teachers can accurately identify where learners are in their learning and have sufficient domain knowledge to understand students' progress (Baird et al., 2017).

Three implications for holistic assessment follow. First, moderation and standardisation are not optional. Where holistic appraisal is used for consequential decisions, assessor moderation and rubric standardisation become central quality-assurance functions. Second, evidence should be cumulative and multi-source. A single holistic judgement is fragile; a longitudinal record of tasks, artefacts, and reflections is defensible. Third, instrument quality must be demonstrated. Holistic assessment is not licensed to use unreliable instruments simply because its aims are humane; the requirement of using valid, reliable, and objective assessment instruments applies with equal force here (Ridho et al., 2025).

7. Equity and Inclusion

Holistic assessment has an equity rationale that is often understated. Where final examinations are cancelled or de-emphasised, teachers' assessment judgment carries more weight, and doubts about teachers' assessment competence raise questions about equity (Volante et al., 2024). Research in two major Norwegian cities found that students were not involved in the assessment process and felt unsupported and insecure about how their learning was assessed, while little teacher collaboration took place — findings that raise direct equity concerns (Volante et al., 2024).

The design response is to make criteria, evidence, and judgement processes visible and shared. Alignment of policy with holistic goals requires policies that promote individual equity, digital competence, and fair inclusion, ensuring that all learners benefit (Álvarez, 2026). In the social-emotional domain, establishing conditions for assessment and data use that maximise benefit while mitigating risks is identified as a core challenge, alongside coordinating standards, assessment, programmes, and professional learning (McKown, 2019). Assessment reform that ignores these conditions risks reproducing old inequalities under a new vocabulary.

8. Implementation: Roles, Barriers, and Policy

8.1 Who does the work

Holistic assessment is distributed work. The literature identifies the roles educators, parents, and community actors can play in fostering the change from narrow measurement to holistic practice (Ravirala, 2026). At system level, recommendations for policymakers include assessment policy changes that align with equity, curricula aligned with holistic goals, and teacher training investments to support those practices (Ravirala, 2026).

National reform frameworks illustrate the scale of such work: India's National Education Policy 2020 embeds holistic education and assessment, and implementation efforts have produced a Holistic Progress Card for the early grades under the NIPUN Bharat Mission, designed on the basis of policy document analysis, desk review, stakeholder deliberation, and focus group discussion (Singh et al., 2023).

8.2 Barriers

Two barriers recur across the literature. The first is resources: the availability of resources, and traditional resistances to change, are identified as the principal obstacles to holistic assessment (Ravirala, 2026). Authentic assessment in particular faces challenges such as resistance of students or a lack of time and resources, which is why a template-based support for practitioners has been proposed (Aysu, 2021).

The second is the dependability of teacher judgement. Because assessment for learning is practised through teachers' and students' judgment, dependability rests on the reliability of teachers' assessments — specifically on whether teachers can identify accurately where learners are in their learning and have sufficient domain knowledge to understand students' progress (Baird et al., 2017). Where assessment reform depends on teachers' professional judgement, that judgement becomes the load-bearing element of the whole system.

8.3 Policy alignment

Assessment reform fails when it is not aligned with curriculum, quality assurance, and teacher development. The requirement is explicit: aligning curriculum, assessment, and quality assurance with broader educational purposes, supported by policies that promote individual equity, digital competence, and fair inclusion (Álvarez, 2026). Where assessment reform is pursued as an isolated technical change, the surrounding accountability architecture will reassert the old priorities.

9. Empirical Evidence of Effectiveness

The empirical case for holistic assessment is uneven but substantive. Three lines of evidence support it.

Formative assessment. The umbrella review evidence indicates positive effects on learning ranging from trivial to large, with no negative effects identified, though the certainty of evidence is low to very low and this precludes robust recommendations about optimal strategies (Sortwell et al., 2024). Effect sizes across meta-analyses range from 0.22 to 0.72 depending on design, context, and feedback type (Karaman, 2021; Yao et al., 2024).

Competency-based and authentic assessment. A mixed-methods study involving 243 educators and 1,528 students across 18 institutions found that well-designed competency-based assessment approaches correlate with statistically significant improvements in student engagement and skill application ($p < .001$) and knowledge retention ($p < .01$), with authentic, project-based assessments yielding the highest learning outcomes when integrated with clear competency frameworks, timely feedback mechanisms, and technology-enhanced assessment tools (Thorat, 2025).

Integrated domain assessment at programme level. A mixed-methods appraisal of a holistic cognitive–affective–psychomotor assessment system in an Arabic Language Education programme, using goal-free evaluation across three academic years, reported that cognitive mean grade point average remained high with on-time graduation reaching 52%, affective ratings of "excellent" of at least 75% across most service dimensions, and graduate outcomes including 92.86% tracer coverage, 97.5% employed in employment, entrepreneurship or further study, and a mean job-seeking time of 4.8 months (Samin et al., 2026). The study attributes these outcomes to a 40–30–30 assessment design explicitly linked to graduate and course learning outcomes and supported by programmatic quality assurance (Samin et al., 2026).

The honest reading of this evidence is that holistic assessment works under identifiable conditions — clear outcome frameworks, timely feedback, moderation, and institutional quality assurance — and that the evidence base remains thinner and less certain than its advocates sometimes imply.

10. Conclusion

Educational assessment through holistic learning is not a rejection of measurement but a re-specification of its object. Where learning is understood as the integrated development of cognitive, affective, and psychomotor capacities, assessment must sample all three, must situate tasks in meaningful contexts, and must treat feedback and reflection as part of learning rather than as commentary on it. The conceptual resources for this are well established in holistic education's concern with wholeness, community, and interconnectedness, and in the domain frameworks that specify what each dimension of learning entails.

The practical resources are also available: formative assessment with a substantial meta-analytic base, authentic and performance tasks with a coherent alignment logic, portfolio methods with a defensible theory of self-regulated learning, maturing social-emotional instruments, and competency-based designs that permit demonstration of skill over time. The unresolved problems are equally clear: reliability and moderation, instrument quality, equity in judgement-based systems, resource constraints, and institutional resistance.

Three priorities follow. First, holistic assessment systems should be built on explicit, published outcome frameworks so that holistic judgement is anchored rather than impressionistic. Second, investment in teacher assessment literacy and in the dependability of professional judgement is a precondition, not a supplement. Third, policy must align curriculum, assessment, and quality assurance if reform is to hold. Educating the whole person is both a pedagogical and societal imperative, preparing individuals not only for academic success but also for meaningful participation in civic, cultural, and global communities (Álvarez, 2026) — and assessment is the mechanism through which a system declares what it actually values.

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