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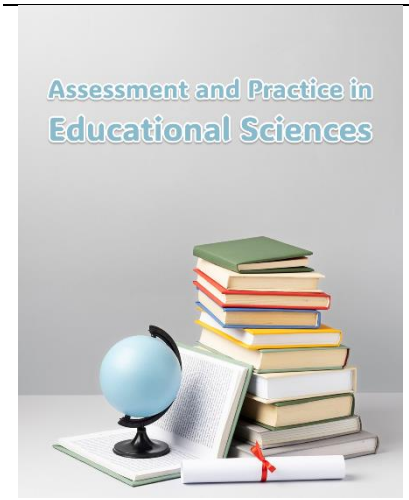

Expert Consensus on Indicators of Authenticity in Problem-Based Assessment Tasks

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ABSTRACT

This study aims to identify expert consensus on the indicators of authenticity in problem-based assessment tasks within higher education contexts. A qualitative research design was employed, utilizing semi-structured interviews with 27 assessment and curriculum experts from universities and educational institutions in Tehran. Participants were selected purposively based on their expertise in assessment design and problem-based learning. Data collection continued until theoretical saturation was achieved. All interviews were audio-recorded, transcribed verbatim, and analyzed using NVivo software. Thematic analysis was conducted to identify major themes and subthemes, ensuring a rigorous and systematic exploration of expert perspectives. Analysis of the data revealed three overarching themes as key indicators of authenticity in problem-based assessment tasks: real-world relevance, cognitive demand and learner engagement, and assessment transparency and fairness. Within these themes, subthemes such as alignment with professional practice, societal impact, authentic resources, collaboration, reflection, clear criteria, equity, and student voice were identified as critical. Experts consistently emphasized the importance of simulating professional environments, addressing meaningful societal problems, fostering higher-order thinking, and ensuring transparent, inclusive assessment processes. The study provides a comprehensive, expert-informed framework for designing authentic problem-based assessments in higher education. By highlighting multidimensional indicators that span real-world alignment, cognitive complexity, and transparent, equitable practices, the findings offer practical guidance for educators and policymakers aiming to enhance the relevance, effectiveness, and fairness of assessment. Adoption of these indicators may better prepare students for the complex challenges of contemporary professional and societal contexts.

Keywords: Authentic assessment, problem-based learning, expert consensus, higher education, assessment design, qualitative research, indicators of authenticity

Introduction

In the landscape of contemporary education, assessment is recognized not only as a tool for measuring student achievement but also as a catalyst for meaningful learning and skill development (Wiliam, 2011). With the growing emphasis on developing 21st-century skills, such as critical thinking, problem-solving, collaboration, and adaptability, educators and policymakers are increasingly challenged to design assessments that move beyond rote memorization and standardized testing (Boud & Soler, 2016; Pellegrino et al., 2016). Among the most promising approaches to aligning assessment with these broader educational aims is the adoption of **authentic assessment**, particularly in the context of problem-based learning (PBL) environments.

Authentic assessment is characterized by its alignment with real-world tasks, integration of complex problem-solving, and emphasis on the demonstration of transferable skills (Gulikers et al., 2004; Herrington & Herrington, 2006).

Problem-based assessment tasks stand at the intersection of PBL and authentic assessment, offering students opportunities to engage with ill-structured, context-rich problems that mirror the complexity and ambiguity of professional and societal challenges (Hmelo-Silver, 2004; Savery, 2006). Such tasks encourage learners to actively construct knowledge, collaborate with peers, and apply disciplinary concepts to novel situations, thereby facilitating deeper learning and the development of adaptive expertise (Darling-Hammond & Adamson, 2014; Lombardi, 2008). However, the effective design and implementation of authentic problem-based assessments remain fraught with challenges, including variability in task quality, questions of fairness and transparency, and the need for consensus on what truly constitutes authenticity in assessment (Sluijsmans et al., 2006; Scott et al., 2020).

Despite the growing body of research advocating for authentic and problem-based assessment, there is a persistent lack of clarity regarding the specific **indicators that signal authenticity** within assessment tasks. This gap has significant implications for educational practice, as the absence of clear criteria may result in inconsistencies in assessment design, threaten the validity and reliability of assessment outcomes, and ultimately hinder the alignment between assessment, instruction, and desired learning goals (Gulikers et al., 2004; Ashford-Rowe et al., 2014). To address this issue, it is essential to engage experts in curriculum, assessment, and instructional design to articulate a consensus around the defining features and indicators of authenticity in problem-based assessment tasks.

Authenticity in assessment has been variously defined in the literature, often centered on the degree to which assessment tasks replicate or simulate the conditions, demands, and cognitive processes of real-world contexts (Shaffer & Resnick, 1999; Wiggins, 1998). Gulikers and colleagues (2004) proposed a five-dimensional framework for authentic assessment, encompassing the task, physical context, social context, assessment criteria, and assessment standards. Building on this foundation, more recent scholarship has expanded the understanding of authenticity to include dimensions such as ethical considerations, inclusivity, and the integration of feedback and reflection (Boud & Soler, 2016; Sambell et al., 2013). Yet, translating these conceptual frameworks into actionable indicators that can be consistently identified and applied in educational practice remains a pressing challenge for educators, particularly within PBL environments.

Problem-based learning itself is grounded in constructivist and socio-cultural theories of learning, positing that knowledge is constructed through active engagement with meaningful problems and collaborative inquiry (Hmelo-Silver, 2004; Savery & Duffy, 1995). Within this paradigm, assessment tasks must not only assess content knowledge but also capture students' abilities to navigate complexity, synthesize information from multiple sources, make informed decisions, and reflect on their learning process (Jonassen, 2011; Loyens et al., 2015). Authentic problem-based assessments are therefore expected to exhibit certain hallmark characteristics: they are situated in relevant contexts, demand higher-order thinking, allow for multiple solutions or approaches, require justification of decisions, and involve diverse perspectives or stakeholders (Herrington & Herrington, 2006; Lombardi, 2008).

Several empirical studies have sought to distill the elements of authenticity in assessment by drawing on the perspectives of educators, students, and professionals. Gulikers et al. (2006) found that both teachers and students value assessment tasks that are perceived as realistic, challenging, and directly relevant to future professional roles. Ashford-Rowe et al. (2014) identified eight critical elements of authentic assessment, including the requirement for students to use judgment and innovation, effectively communicate their solutions, and undertake assessments that are significant beyond the classroom. Similarly, research by Scott et al. (2020) highlighted the importance of transparency, fairness, and alignment with professional practice as key dimensions of authentic assessment.

Despite these advances, a number of challenges remain unresolved. First, the complexity of real-world problems can be difficult to simulate in classroom settings without oversimplifying or abstracting the task to the point where authenticity is diminished (Sambell et al., 2013). Second, ensuring fairness and equity in authentic assessments requires careful attention to the diverse backgrounds, prior experiences, and learning needs of students (Bearman et al., 2016). Third, the processes of assessment design and evaluation can be resource-intensive, particularly when involving external stakeholders, real-world data, or iterative cycles of feedback and revision (Darling-Hammond & Adamson, 2014). These challenges underscore the need for a clear, expert-informed consensus on what constitutes authenticity in problem-based assessment, and how it can be robustly operationalized across contexts.

A further complication arises from the inherent subjectivity in judgments of authenticity. What appears "authentic" to one group of educators or professionals may not resonate with another, depending on disciplinary norms, institutional culture, and the intended learning outcomes (Sluijsmans et al., 2006; Gulikers et al., 2004). As a result, many institutions have moved toward collaborative or consensus-driven approaches to defining assessment criteria, involving panels of experts, industry representatives, and sometimes students themselves in the co-construction of standards (Boud & Soler, 2016; Sambell et al., 2013). This collaborative process not only enhances the credibility and legitimacy of assessment practices but also fosters a shared understanding among stakeholders regarding the purposes and processes of assessment.

In recent years, advances in qualitative research methodologies have provided valuable tools for exploring and synthesizing expert perspectives on complex educational issues. Techniques such as semi-structured interviews, focus groups, and thematic analysis enable researchers to capture nuanced insights, uncover tacit knowledge, and identify recurring themes across diverse participants (Braun & Clarke, 2006). In the context of authentic assessment, such methods are particularly well-suited to surfacing the experiential, context-dependent, and sometimes contested indicators of authenticity that are not easily reducible to quantitative metrics (Bearman et al., 2016; Scott et al., 2020).

This study builds on this body of work by engaging a purposively selected group of assessment and curriculum experts to articulate a consensus on the indicators of authenticity in problem-based assessment tasks. By systematically analyzing the views of practitioners deeply immersed in assessment design and implementation, the study aims to provide a clear and actionable set of indicators that can inform assessment practice, policy, and future research. The focus on expert consensus is intended to address the persistent ambiguity in the field, promote greater consistency and transparency in assessment practices, and ultimately enhance the alignment between assessment, instruction, and the complex demands of the contemporary world.

In summary, as educational systems worldwide continue to grapple with the imperatives of preparing learners for uncertain, dynamic, and interconnected futures, the need for authentic, problem-based assessment has never been more urgent. Achieving this goal depends on the ability of educators to clearly define, operationalize, and implement indicators of authenticity that are both theoretically sound and practically viable. By foregrounding expert consensus and leveraging qualitative inquiry, this study seeks to make a meaningful contribution to the ongoing evolution of assessment in the service of transformative, real-world learning.

Methods and Materials

Study Design and Participants

This study employed a qualitative research design to explore expert consensus on indicators of authenticity in problem-based assessment tasks. The qualitative approach was selected to allow for an in-depth understanding of participants' perceptions, experiences, and professional judgments regarding authentic assessment practices. The study sample consisted of

27 participants, all recognized as experts in assessment and curriculum design, with significant experience in problem-based learning environments. Participants were purposefully recruited from universities and educational institutions in Tehran to ensure a breadth of perspectives from those actively engaged in assessment innovation and educational reform. Criteria for inclusion included at least five years of experience in higher education, demonstrated expertise in assessment design, and familiarity with problem-based assessment practices.

Data Collection

Data collection was conducted exclusively through semi-structured interviews. This method was chosen for its flexibility in allowing participants to elaborate on their insights while ensuring that key themes related to authenticity in assessment were consistently addressed across interviews. The interview protocol comprised open-ended questions designed to elicit detailed responses regarding the characteristics, indicators, and challenges of authentic problem-based assessment tasks. Interviews were conducted face-to-face or via secure online platforms, depending on participant preference and availability. Each interview lasted approximately 45 to 60 minutes. Data collection continued until theoretical saturation was achieved, meaning no new themes or indicators emerged from additional interviews, ensuring comprehensiveness and depth in the findings.

Data analysis

All interviews were audio-recorded with participant consent and subsequently transcribed verbatim to ensure the accuracy of data analysis. The transcribed data were imported into NVivo software (version XX) to facilitate systematic organization, coding, and analysis of qualitative data. Thematic analysis was employed, following Braun and Clarke's (2006) six-step framework: familiarization with the data, initial coding, searching for themes, reviewing themes, defining and naming themes, and producing the final report. Coding was conducted iteratively and independently by at least two members of the research team to enhance reliability. Discrepancies in coding were discussed until consensus was reached. The analysis focused on identifying recurring patterns and salient indicators of authenticity in problem-based assessment as perceived by the expert participants. The use of NVivo facilitated the management of large amounts of textual data and supported the rigorous examination of both explicit and nuanced meanings in participant narratives.

Findings and Results

Category 1: Real-World Relevance

Alignment with Professional Practice:

Participants widely emphasized that authentic assessment tasks should mirror real workplace activities and industry standards. Tasks simulating professional scenarios, integrating case studies, and using industry-specific tools were repeatedly identified as critical. As one expert explained, "If students don't see a connection to what they will actually do in their jobs, the assessment loses its authenticity." Others mentioned the importance of "embedding actual case files or patient histories into medical assessments" to make the experience more genuine.

Societal Impact:

A recurring subtheme was the need for tasks to address real societal challenges. Experts argued that connecting assessments to issues such as public health, environmental sustainability, or community needs helps students understand the larger significance of their work. One participant noted, "When we ask students to solve problems that affect their own communities, they become much more invested in the outcome." Another added, "Bringing in current social justice debates can make the task feel immediate and meaningful."

Contextual Complexity:

The inclusion of multiple stakeholders, ambiguous or incomplete data, and real-world constraints was regarded as essential to authenticity. Such complexity requires students to engage in deeper reasoning and make judgment calls, just as professionals do. “Life doesn’t present problems with clear-cut answers,” one participant observed, “and our assessments shouldn’t either. Students need to learn how to navigate uncertainty.”

Authentic Resources:

Use of genuine resources—such as professional documents, technical manuals, policy briefs, or news reports—was highlighted as a hallmark of authentic assessment. Participants argued that “students should grapple with the same messy, real-life documents professionals use.” For example, including “actual policy drafts or technical specs” was said to enhance realism.

Stakeholder Involvement:

Authenticity was further enhanced by engaging external stakeholders, such as industry experts or community partners, in the assessment process. Involving practitioners in reviewing student work or providing feedback was described as highly motivating. As one interviewee remarked, “When students know a real engineer or NGO leader will see their project, they raise their game.”

Practical Application:

Participants stressed the value of assessments culminating in tangible, actionable outcomes—such as prototypes, presentations, or policy recommendations. “We want students to produce work that doesn’t just sit in a drawer, but actually could be implemented somewhere,” a respondent stated.

Consequences and Outcomes:

Finally, assessments with real consequences—whether simulated or actual—were considered vital for authenticity. Participants spoke of the importance of “having external stakeholders react to student proposals, so students see the impact of their decisions.” One expert summed up: “Authentic tasks should create a sense of accountability for the results.”

Category 2: Cognitive Demand and Learner Engagement

Problem Complexity:

Experts agreed that authentic tasks require students to tackle ill-structured, multifaceted problems demanding synthesis, creativity, and adaptability. These tasks “don’t have a single right answer,” as one participant explained, “so students have to weigh options and justify their approaches.” Another added, “It’s the complexity and open-endedness that make the learning stick.”

Inquiry and Investigation:

The need for independent information-seeking and critical investigation was repeatedly noted. Authentic assessments “should push students to ask questions, conduct research, and critically evaluate sources,” said one expert. Another mentioned, “We see the best learning when students chase down the evidence themselves.”

Decision-Making Process:

Participants emphasized that students should be required to justify their choices, navigate trade-offs, and refine their solutions iteratively. “Good tasks don’t just ask for a final answer—they want to see the student’s reasoning along the way,” explained an assessment designer. One interviewee said, “We look for evidence of thinking, not just the outcome.”

Collaboration and Teamwork:

Authentic tasks often demand effective teamwork, negotiation, and distributed responsibility. Participants described how group projects, role assignments, and peer accountability simulate real-world collaborative settings. “No one works in isolation in most professions,” one participant observed. “Assessment should reflect that reality.”

Reflection and Self-Regulation:

Encouraging students to reflect on their learning, monitor their own progress, and adapt strategies was cited as essential. One educator shared, “Reflection journals or progress reports help students become more self-aware and take ownership of their learning journey.” Another commented, “We explicitly build in opportunities for students to step back and assess how they’re doing.”

Category 3: Assessment Transparency and Fairness

Clear Criteria and Standards:

Experts unanimously agreed that clear, transparent rubrics and explicit performance benchmarks are essential for authentic assessment. “Students must know what is expected and how their work will be judged,” emphasized one participant. “When we make criteria transparent, it builds trust and improves performance.”

Feedback Mechanisms:

Effective feedback—timely, specific, and actionable—was regarded as indispensable. The value of peer and self-assessment, as well as opportunities for iterative improvement, was emphasized. One interviewee stated, “Students thrive when they receive feedback they can use right away to make their work better.” Another mentioned, “Peer feedback brings fresh perspectives that teachers might not catch.”

Equity and Accessibility:

Ensuring that assessment tasks are accessible and inclusive was a critical concern. Participants stressed the need for accommodations, varied entry points, and cultural sensitivity. “If a student’s background or learning needs are ignored, we lose authenticity and fairness,” a specialist noted.

Validity and Reliability:

Authentic assessments should maintain high validity and reliability through consistent scoring, multiple raters, and triangulation. “Having more than one assessor helps ensure that scoring is not biased,” one expert observed, while another added, “Triangulating data increases our confidence in the results.”

Ethical Considerations:

Ethics—academic integrity, privacy, and responsible information use—was a recurring theme. Experts advocated for “making sure students understand the ethical dimensions of their work, including consent and data privacy.” As one participant explained, “The authenticity of a task is compromised if ethical standards are not upheld.”

Student Voice:

Involving students in task design, negotiating criteria, or allowing some choice in the process was seen as enhancing both fairness and authenticity. “When students have agency in their assessment, they engage more deeply and see the value,” a participant remarked.

Discussion and Conclusion

The aim of this study was to identify expert consensus on the indicators of authenticity in problem-based assessment tasks, using in-depth qualitative interviews with 27 experts from Tehran. The findings revealed three overarching themes: real-world relevance, cognitive demand and learner engagement, and assessment transparency and fairness. Each theme encompasses several nuanced subthemes and specific indicators that collectively provide a comprehensive framework for designing and evaluating authentic assessment in problem-based learning (PBL) contexts.

The first major finding, real-world relevance, encapsulated participants’ consistent emphasis on assessment tasks mirroring the complexities, roles, and outputs of professional practice. Experts highlighted the importance of aligning assessment

activities with industry standards, integrating authentic resources, engaging with societal impact, and involving external stakeholders. This was complemented by the expectation that tasks should culminate in practical application and real consequences, reinforcing the sense of accountability and motivation among students.

The second major theme, cognitive demand and learner engagement, was characterized by the need for problem complexity, inquiry-driven learning, iterative decision-making, and collaboration. Experts argued that authentic assessments should not only demand higher-order thinking and synthesis but also foster self-regulation and reflection, simulating the adaptive processes required in real-world professional environments.

The third theme, assessment transparency and fairness, brought to the fore the necessity of clear criteria, robust feedback mechanisms, equity and accessibility, validity and reliability, ethical considerations, and student voice in the assessment process. Participants consistently stressed the importance of transparent rubrics, actionable feedback, inclusive design, and shared responsibility for both teachers and learners in constructing the assessment environment.

These findings align closely with established theories and frameworks in the literature on authentic assessment and problem-based learning. The emphasis on real-world relevance echoes Gulikers et al.'s (2004) five-dimensional framework, which underscores the importance of simulating real-life tasks, environments, and interactions in assessment to bridge the gap between academic learning and professional practice. Similarly, Wiggins (1998) and Herrington and Herrington (2006) argue that authentic assessments are defined by their alignment with real-world standards, contextual complexity, and stakeholder engagement—core aspects consistently highlighted by the experts in this study.

The subthemes relating to societal impact and practical application are well-supported in the literature. Ashford-Rowe et al. (2014) identified the use of significant, consequential tasks and involvement of authentic stakeholders as critical elements in authentic assessment design. The participants' calls for tasks that address community needs or have real-world impact are also reflected in Lombardi's (2008) assertion that authentic learning environments should "immerse students in tasks that matter beyond the classroom." This external orientation not only enhances the perceived value of assessment for students but also motivates deeper engagement and learning (Darling-Hammond & Adamson, 2014).

The importance of cognitive demand, including problem complexity and learner engagement, has been documented as central to both authentic assessment and PBL (Hmelo-Silver, 2004; Jonassen, 2011). The current study's findings, emphasizing ill-structured problems, inquiry, and iterative decision-making, are consistent with research indicating that students learn more effectively when challenged with open-ended, complex tasks that demand synthesis and justification (Savery, 2006; Loyens et al., 2015). The recognition of teamwork, negotiation, and self-regulation further corroborates the findings of Bearman et al. (2016), who noted that collaboration and reflection are vital to fostering lifelong learning skills and adaptability.

Assessment transparency and fairness have emerged in both the present study and previous literature as indispensable for authentic and equitable assessment. Gulikers et al. (2006) and Sambell et al. (2013) found that clear rubrics, transparent criteria, and timely feedback not only enhance student trust and motivation but also lead to improved performance and reduced anxiety. The explicit inclusion of equity and accessibility aligns with recent calls for inclusive assessment practices that accommodate diverse student needs and backgrounds (Scott et al., 2020; Bearman et al., 2016). Furthermore, the attention to validity, reliability, and ethical considerations in this study supports the arguments of Pellegrino et al. (2016), who emphasized the necessity of rigorous assessment standards to ensure meaningful, defensible judgments of student learning.

The final subtheme—student voice in assessment—represents an emerging area in the literature. Involving students in the co-construction of assessment criteria, as advocated by Boud and Soler (2016), empowers learners, increases agency, and creates a more participatory, democratic learning environment. This is consistent with the perspectives gathered from experts in this study, who saw student input as a means to enhance both authenticity and fairness.

The convergence of these themes and indicators in expert accounts points to a robust, multidimensional understanding of authenticity in problem-based assessment. The framework articulated by participants in this study reflects not only best practices but also addresses persistent challenges in operationalizing authenticity across diverse educational contexts. The triangulation of real-world tasks, cognitive complexity, and transparent, equitable assessment processes underscores the intricate balance required to design assessments that are both meaningful and fair.

Despite strong alignment with previous scholarship, this study also extends the literature in several important ways. First, it provides rich, context-specific insights from a diverse group of assessment experts, offering practical indicators that can guide educators in multiple disciplines. Second, by synthesizing expert perspectives, the study highlights the dynamic interplay between assessment design, implementation, and evaluation, acknowledging the challenges of maintaining authenticity, equity, and validity in real-world educational settings. Third, it demonstrates the utility of qualitative, consensus-driven methodologies for generating nuanced frameworks that are responsive to the evolving demands of contemporary education.

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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 adheried 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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