Pedagogy Review

ISSN: 3025-6771 | Journal's DOI: 10.61436/pedrev

Homepage: https://imrecsjournal.com/journals/index.php/pedrev

A Critical Analysis of Sociology Teachers' Pedagogical Practices Through Performance Test Documents of the 2025 In-Service Teacher Professional Education Program

Siany Indria Liestyasari*, Atik Catur Budiati, Dwi Astutik, Bagas Narendra Parahita, & Ghufronudin

Sociology Anthropology Education Study Program, Universitas Sebelas Maret, Indonesia

ARTICLE INFO

Article History:

Received: 20 July 2026

Accepted: 22 October 2026

Published: 03 November 2026

Keywords:

Teacher performance test;
TPACK;
Critical pedagogy;
Sociology teaching module;
Performativity

Corresponding Author:

sianyindria@staff.uns.ac.id

ABSTRACT

This study aims to (1) describe the completeness and alignment of lesson planning in the teaching modules of Sociology teachers who took the 2025 In-Service Teacher UKIN with the indications of learning practice they contain, viewed through the Technological Pedagogical Content Knowledge (TPACK) framework, and (2) critically analyze teacher performance in the UKIN through the critical pedagogy perspectives of Paulo Freire and Henry Giroux and Stephen Ball's theory of performativity. The study used a qualitative approach, applying Braun and Clarke's thematic analysis to a purposive sample of 190 Sociology teaching-module documents from UKIN participants at one teacher-education institution (LPTK). The results show that the administrative-format completeness of the teaching modules is generally good, while the substantive depth of teachers' pedagogical competence remains variable. Lesson planning tends to target low-to-moderate cognitive levels, with lower-order thinking categories dominating most modules; assessment items misalign with Higher Order Thinking Skills (HOTS)-oriented learning objectives in most documents; and PowerPoint remains the dominant, often the only, technology used across most modules. Viewed through the critical lenses of Freire's banking education, Giroux's transformative intellectuals, and Ball's performativity theory, these findings suggest that the UKIN's current design and practice emphasize administrative and technical compliance more than cultivating substantive pedagogical reflection among teachers. Nevertheless, these patterns also reveal concrete entry points for reform, including rubric refinement, continuous mentoring, and reflective assessment components, through which the UKIN could more fully realize its intended role in fostering transformative, reflective teaching practice.

To cite this article:

Liestyasari, S. I., Budiati, A. C., Astutik, D., Parahita, B. N., & Ghufronudin (2026). A critical analysis of sociology teachers' pedagogical practices through performance test documents of the 2025 in-service teacher professional education program. *Pedagogy Review*, *5*(4), 621-636. doi: https://doi.org/10.61436/pedrev/v5i4.pp621-636

This is an open access article under the CC BY SA licence (https://creativecommons.org/licenses/by-sa/4.0/).

■ INTRODUCTION

The United Nations, through the Sustainable Development Goals (SDGs), has set 17 goals for all member states to achieve by 2030 (Moore, 2015; Stafford-Smith et al., 2017; United Nations General Assembly, 2015). The fourth goal, Quality Education, affirms the importance of ensuring inclusive, equitable, and quality education for all, which is essential for a dignified life (United Nations General Assembly, 2015; Unterhalter, 2019). Target 4.c of that goal explicitly calls for a significant increase in qualified teachers, including through international cooperation in teacher training, particularly in developing countries. This provision affirms that education quality is inseparable from teacher quality, as teachers are key actors in the classroom learning process (UNESCO, 2024; Darling-Hammond, 2000; Hanushek & Rivkin, 2012). The OECD's (2025) international report further confirms that high learning achievement depends heavily on the quality of teachers' classroom teaching practice, not merely on the availability of curricula or adequate facilities.

In response, many countries, including Indonesia, have adopted performance-based assessment models to evaluate prospective professional teachers. The Teacher Professional Education Program (PPG), with the Performance Test (UKIN) as its core component, evaluates prospective teachers' competence through concrete evidence of teaching practice, including lesson-planning documents (teaching

modules/lesson plans) and video recordings of teaching practice. Darling-Hammond and Snyder (2000) argue that this type of assessment evaluates teachers' professional ability through authentic artifacts, offering a more comprehensive picture than conventional written tests (see also Pecheone & Chung, 2006). Blomberg et al. (2013) further emphasize that recordings of teaching practice can provide rich data for evaluating instructional quality. However, such data are meaningful only if the resulting documents genuinely represent teachers' pedagogical thinking, rather than merely fulfilling the administrative format required by the system.

The quality of learning produced by an instructional design depends largely on the constructive alignment among learning objectives, learning activities, and assessment (Biggs, 1996; Biggs & Tang, 2011). This lack of alignment can lead to surface learning, as Marton and Säljö's (1976) classic study describes in terms of qualitative differences in learning processes and outcomes. In the context of technology integration, the Technological Pedagogical Content Knowledge (TPACK) framework, developed by Mishra and Koehler (2006) from Shulman's (1986, 1987) notion of pedagogical content knowledge, asserts that the use of technology cannot be separated from pedagogical and content knowledge and is therefore not merely a technical use of digital tools (Graham, 2011; Voogt et al., 2013). The framework issued by Indonesia's Ministry of Primary and Secondary Education (Kementerian Pendidikan Dasar dan Menengah [Kemendikdasmen], 2025) on deep learning further affirms three main pillars of quality learning, mindful learning, meaningful learning, and joyful learning, which demand mature pedagogical competence from teachers in designing a coherent learning experience.

Research on the UKIN (Performance Test) is critically important because performance-based assessment in teacher education often faces a structural dilemma: whether such instruments genuinely measure authentic competence or merely produce administrative compliance. Critiques of this evaluation model are not confined to Indonesia, where portfolio-based certification has proven vulnerable to manipulation (Haryanto et al., 2016), but extend across the Global South. Stringent accountability regimes in various countries have been shown to push teachers toward a culture of performativity, one that erodes authentic pedagogical judgment in favor of meeting standardized formats (van Wyk & le Grange, 2017; de la Vega Rodríguez & Carrasco-Aguilar, 2026). This is precisely where critical research on the UKIN is urgent: re-examining the philosophical foundations underlying this evaluation system. Through the conceptual lens of Stephen Ball (2003), this study anticipates the risk of a mechanistic process in which the teaching modules composed by PPG participants become trapped as mere "fabrications." This phenomenon occurs when teachers produce administrative documents solely to satisfy rubric indicators, rather than to represent their genuine pedagogical competence and classroom beliefs. Ultimately, UKIN research provides an essential foundation for ensuring that teacher certification drives substantive transformation in learning.

This concern closely relates to Paulo Freire's (1970/2007) classic critique of "banking education," a practice that treats students as passive recipients of information deposited by the teacher, leaving no room for dialogue, critical consciousness (conscientization), or a structural reading of social reality. Henry Giroux (1988, 2010) extends this critique by emphasizing the importance of positioning teachers as transformative intellectuals-subjects who do not merely implement the curriculum technically, but who reflectively and critically design learning that liberates and empowers students. These three critical educational theory frameworks-banking education and conscientization from Freire, transformative intellectuals from Giroux, and performativity from Ball-are used in this study as a second interpretive lens alongside TPACK to read the data more deeply, particularly to assess whether the teacher performance recorded in UKIN documents reflects authentic pedagogical competence or merely compliance with a performance-accountability regime.

Sociology as a subject has its own distinctive character in this context. As a discipline oriented toward a critical reading of social phenomena, such as social Interaction, inequality, conflict, and social change (Bostean & Leitz, 2022; Palmer, 2023), Sociology instruction should ideally be the space most conducive to nurturing students' critical consciousness as envisioned by Freire (Fobes & Kaufman, 2008). Ironically, it is precisely in this subject that the question of how far teachers can translate the reflective-critical nature of the sociological discipline into a genuinely empowering instructional design becomes highly relevant to examine empirically.

Previous research on performance-based assessment and teacher TPACK tends to be quantitative and descriptive, stopping at mapping competency achievement (Abbitt, 2011; Schmidt et al., 2009; Seifert & Lindmeier, 2024; Yang & Wei, 2025; Yue et al., 2024). These studies make an important contribution to measuring teachers' readiness and perceptions of TPACK,

but relatively rarely examine critically what lies hidden behind teacher-performance documents, or how the assessment system itself helps shape and constrain the forms of pedagogical representation that appear in those documents (cf. Sato, 2014). This is where the novelty of the present study lies: combining TPACK-based thematic analysis with a critical reading through the perspectives of critical pedagogy and performativity theory of 190 teaching-module documents of Sociology teachers who took the 2025 Designated Teacher UKIN, so as not only to map "what exists" in the documents, but also to interpret "why" such patterns emerge and their implications for the quality of Sociology education and the broader achievement of SDG 4.

Based on the foregoing, this study formulates two research questions: (1) what is the picture of the completeness and alignment of lesson planning in the teaching modules of Sociology teachers who took the 2025 Designated Teacher UKIN with the indications of learning practice contained therein, analyzed within the TPACK framework; and (2) how can the teacher performance recorded in these UKIN documents be read critically through the critical pedagogy perspectives of Freire and Giroux and Ball's theory of performativity. In line with these questions, this study aims to (1) describe the completeness and alignment of teaching modules with the indications of learning practice of Sociology teachers within the TPACK framework, and (2) critically analyze teacher performance in the UKIN through the perspectives of Freire, Giroux, and Ball, in order to contribute ideas toward strengthening a more substantive and equitable teacher performance-assessment system in Indonesia.

■ METHOD

Research Design

This study used a qualitative approach with Braun and Clarke's (2006, 2019) Thematic Analysis, chosen for its flexibility in identifying recurring patterns of meaning in textual data (Krippendorff, 2018). TPACK coding formed a first analytical layer, and critical interpretation grounded in critical pedagogy and performativity theory formed a second, yielding findings that are both descriptive and argumentative-interpretive.

Data Collection

The data comprised 190 teaching modules for senior high Sociology, composed by participants in the 2025 In-Service Teacher UKIN at one LPTK (96 from Batch 1, 81 from Batch 2, and 13 from Batch 3; 125 of the 190 participants came from outside Java, reflecting national policy that prioritizes UKIN implementation there). The modules were selected through purposive sampling, a non-probability technique, from the 420 participants of the three batches, because the analysis required documents that could be read in full and compared across the same core components. Eligibility parameters applied at initial selection were: (1) a complete senior-high Sociology teaching module or lesson plan; (2) officially composed for the 2025 UKIN; (3) containing, at minimum, learning objectives, learning-activity steps, and assessment instruments; (4) addressing grade X or XI material; and (5) an accessible, readable file. Inaccessible or ineligible documents were excluded, so the sample is an accessible subset rather than a census, and the findings are not statistically generalized to all 420 participants. Access was authorized by the LPTK through official letter number 17372/UN27.02/PT.01.06/2026, and all documents were de-identified with anonymous codes before analysis.

Documents were collected through Documentary Study (Creswell & Creswell, 2018) and treated not as inert objects but as cultural and professional artifacts that record teachers' planning and pedagogical self-representation. The collection followed four stages: (1) inventory of all modules in PDF or Word format; (2) screening against the eligibility parameters above; (3) digital archiving through an online form, with identification codes that preserve author anonymity and allow data tracking; and (4) component mapping, extracting text on learning objectives (cognitive orientation), learning steps (classroom interaction and instructional model), assessment (form of evaluation), and TPACK integration.

FGD data were also collected in a single session in May 2026 with eight informants: three lecturers from Sociology Education programs and five Sociology teachers from public senior high schools (SMAN), all with prior experience assessing the UKIN and deliberately selected for that first-hand experience (Morgan, 1996). A semi-structured protocol covered (1) their experiences evaluating Sociology UKIN participants; (2) recurring patterns in cognitive-level orientation, HOTS alignment, and technology use across the modules they reviewed; and (3) the extent to which the UKIN captures authentic pedagogical competence rather than administrative compliance.

Data Analysis

The analysis used two layers. The first drew on the categorical logic of content analysis (Bowen, 2009; Elo & Kyngäs, 2008; Hsieh & Shannon, 2005; Krippendorff, 2018) to code the 190 modules into TPACK-based categories. The second applied Braun and Clarke's (2006,

2019) reflexive thematic analysis to interpret the coded data through the critical lenses of Freire, Giroux, and Ball, turning descriptive categories into themes about teacher performativity and administrative compliance, so that the study moves from counting patterns to interpreting their pedagogical and structural meaning. The process followed Braun and Clarke's (2006) six recursive stages: familiarization, initial coding, searching for themes, reviewing themes, defining and naming themes, and producing the report in dialogue with critical pedagogy and TPACK literature.

Data reduction and coding procedure

Two coders worked manually in two stages. In open coding, each coder independently read all 190 documents line by line and assigned initial codes to segments on learning objectives, learning steps, assessment items, and technology use, without predetermined categories (Campbell et al., 2013; Nowell et al., 2017). In axial coding, related codes were grouped into four TPACK-based categories: Content Knowledge (CK), the depth of Sociology subject matter; Pedagogical Knowledge (PK), general classroom-management strategies; Pedagogical Content Knowledge (PCK), subject-specific teaching strategies; and Technological Pedagogical Content Knowledge (TPACK), the simultaneous integration of the three. A structured coding matrix was used instead of qualitative data analysis software, keeping both coders close to the original documents.

Consensus coding as a validity strategy

Instead of statistical inter-coder reliability, coding followed the consensus-based logic of Consensual Qualitative Research (Hill et al., 1997). The two coders independently coded a subset of documents, compared codes, discussed discrepancies, and negotiated a shared interpretation until they agreed on the coding framework, which was then applied to the remaining documents; recurring disagreements led to joint refinement of code definitions. Persistent differences were resolved by re-examining the original text together, not by majority vote or statistical adjustment. This negotiated agreement served as the main safeguard against individual interpretive bias.

Triangulation

Themes from this consensus-based coding were cross-checked against the FGD transcript (see Data Collection). Where FGD accounts converged with document-based themes, confidence in interpretive validity was strengthened; where they diverged or added nuance, they enriched rather than overrode the document-based analysis.

■ RESULT AND DISCUSSION

A teaching module is the operational form of the Learning Outcomes (CP) and Learning Objective Flow (ATP) within the Merdeka Curriculum. Unlike the previous Lesson Implementation Plan (RPP), it is a more contextual, flexible, and student-centered planning document and can therefore serve as a data basis for empirically capturing teachers' pedagogical ability. Ideally, a module comprises three parts: general information (identity, students' initial competence, Pancasila Student Profile dimensions, facilities, target students, and strategy); a core component (measurable learning objectives, meaningful understanding, trigger questions, a learning-activity sequence aligned with the strategy's syntax, closing and reflection activities, and diagnostic, formative, and summative assessment with aligned rubrics); and an appendix (Student Worksheets/LKPD, learning resources, glossary, and bibliography). The results below are organized around the two research questions: (1) the completeness and alignment of lesson planning within the TPACK framework, and (2) the empirical patterns that provide the basis for a critical reading of teacher performance in the UKIN. Interpretation and comparison with previous studies are reserved for the Discussion.

Completeness and Alignment of Lesson Planning with Indications of Learning Practice (RQ1)

Completeness of teaching-module components

Completeness was examined through the formulation of learning objectives, trigger questions, subject-matter selection, instructional strategy, instructional media, Student Worksheets (LKPD), assessment, closing activities, and assessment rubrics. Bloom's Taxonomy was used in the overwhelming majority of modules to formulate learning objectives (LOs). Because a module could state objectives at more than one level, the categories in Figure 1 are not mutually exclusive. LOs concentrated at the lower levels: C1 (remembering) appeared in 113 modules (59.5%) and C2 (understanding) in 124 modules (65.3%). Among the higher levels, only C4 (analyzing) was common, appearing in 97 modules (51.1%), whereas C3 (applying, 8.4%), C5 (evaluating, 7.4%), and C6 (creating, 11.1%) were rare. Five modules (2.6%) stated no learning objective and merely listed material details, and a small number of modules named no cognitive level. Level C4 generally co-occurred with problem-based learning, C1 and C2 with

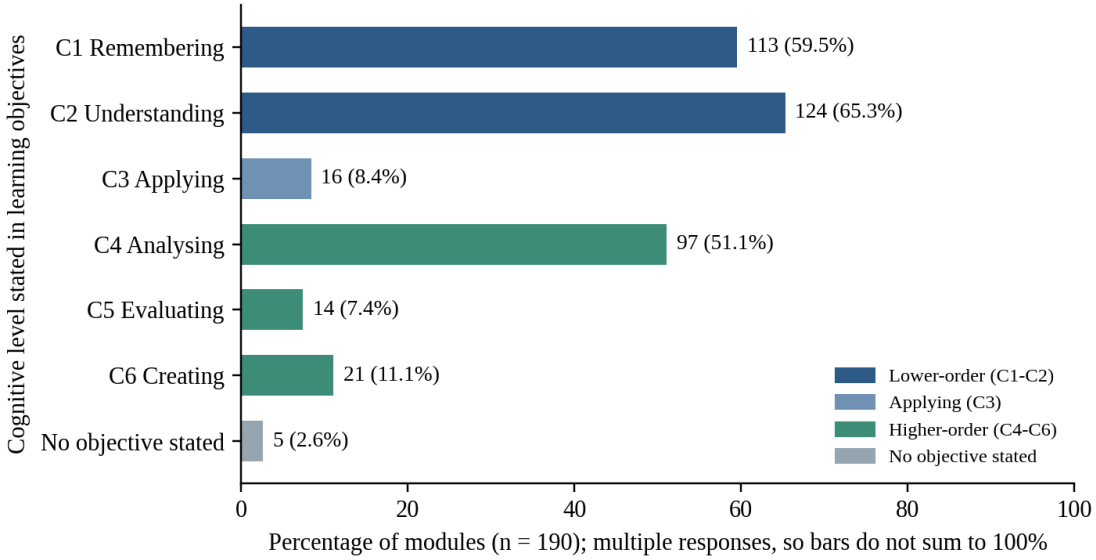


Figure 1. Cognitive levels of learning objectives in the 190 teaching modules (Bloom's Taxonomy).

discovery learning, and C6 with project-based learning

A trigger question was present in 163 modules (86%) and absent in 27. Forms ranged from simple content-related questions and picture guessing to student self-reflection, and they differed in how well they were tied to the material and the learning objective (Figure 2). An appropriate example is a module on social problems whose trigger questions asked whether students had seen piles of garbage in the street or houses built beside a railway track and whether these could be categorized as social problems (Figure 2a); the questions are concrete, drawn from familiar experience, and lead directly to the objective of analyzing examples of social problems. In some modules the trigger-question field was present but left empty (Figure 2b). In others, the question was present but not synchronized with the objective. In a module on social groups, the learning outcome concerned critical and creative solutions to social problems in a digital society and the objective concerned appreciating and feeling responsible toward social groups, yet the only trigger question asked what a social group is (Figure 2c). This question asks directly for the definition that the lesson is meant to teach, in abstract terms and without a concrete situation, so it neither activates students' prior experience nor leads toward the stated objective.

In subject-matter selection, Social Interaction was the most frequently chosen topic, followed by Social Problems, Social Change, Social Groups–Social Relations–Social Mobility, and Social Conflict and Integration; Sociology as a Discipline and Social Symptoms were the least chosen, with Social Symptoms ranking lowest overall. Problem-Based Learning (PBL) was the most frequently stated instructional strategy, far ahead of Project-Based Learning, Discovery Learning, Inquiry Learning, and Cooperative Learning, and respondents still conflated student-centered learning as an approach with a specific model.

Instructional media and technology use are summarized in Figure 3. PowerPoint ranked first among media, followed by video and case studies, while only a small share of modules named no media (Figure 3a). Video was typically embedded as a YouTube or Google Drive link and used at apperception, during core explanation, or as the basis of a case discussion; case studies drew on news excerpts and, in some modules, on Instagram or TikTok content. PowerPoint was likewise the leading tool for delivering content, ahead of YouTube or digital news, with interactive platforms and artificial intelligence used far less (Figure 3b)

The FGD converged with this pattern. Participants from both groups, the lecturers and the teachers who had assessed the UKIN, described Sociology teachers' TPACK as still limited in its technological dimension: most teachers already use technology as a learning aid, but its use is largely confined to video, PowerPoint, and digital learning applications that serve as quizzes or assessments.

Closing activities, LKPD, assessment, and rubrics are consolidated in Figure 4 (frequencies in Appendix Table A1) together with the alignment indicators reported in Section 1b. Most assessments were summative, administered at the end of the lesson and predominantly in multiple-

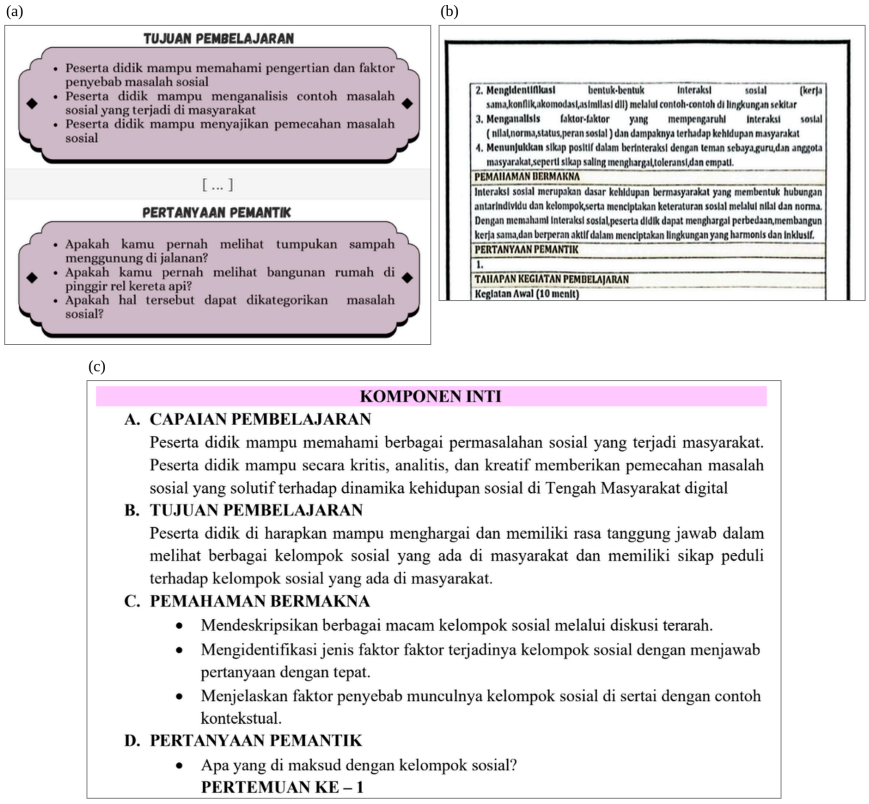


Figure 2. Authentic excerpts (anonymized screenshots) of learning objectives and trigger questions from the analyzed modules

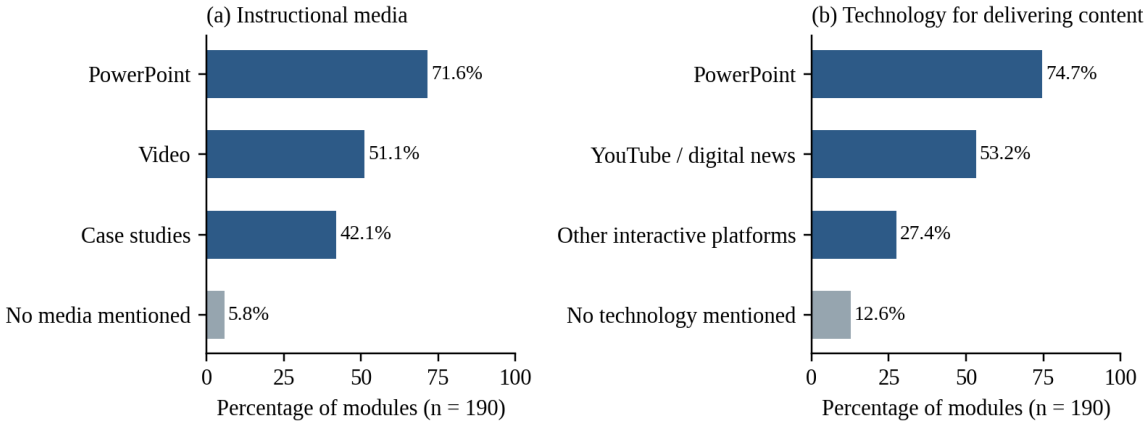


Figure 3. (a) Instructional media and (b) technology used for delivering content ranked by share of modules (n = 190).

choice form, followed by short essays, rather than the ideal package of diagnostic, formative, summative, and reflective assessment. The most common rubric assessed group-discussion process, but its indicators (e.g., discipline, responsibility, and cooperation) were often not explicitly linked to the learning objectives or to the graduate-profile dimensions the lesson was meant to develop. Most modules displayed the introduction–core–closing stages systematically.

Alignment between lesson planning and indications of learning practice

Figure 4 summarises the eight completeness and alignment indicators as the share of the 190 modules that were complete or aligned, incomplete or misaligned, or silent on the indicator; the frequencies are given in Appendix Table A1. Alignment varied systematically with the kind of work an indicator demands. Indicators that can be met by including

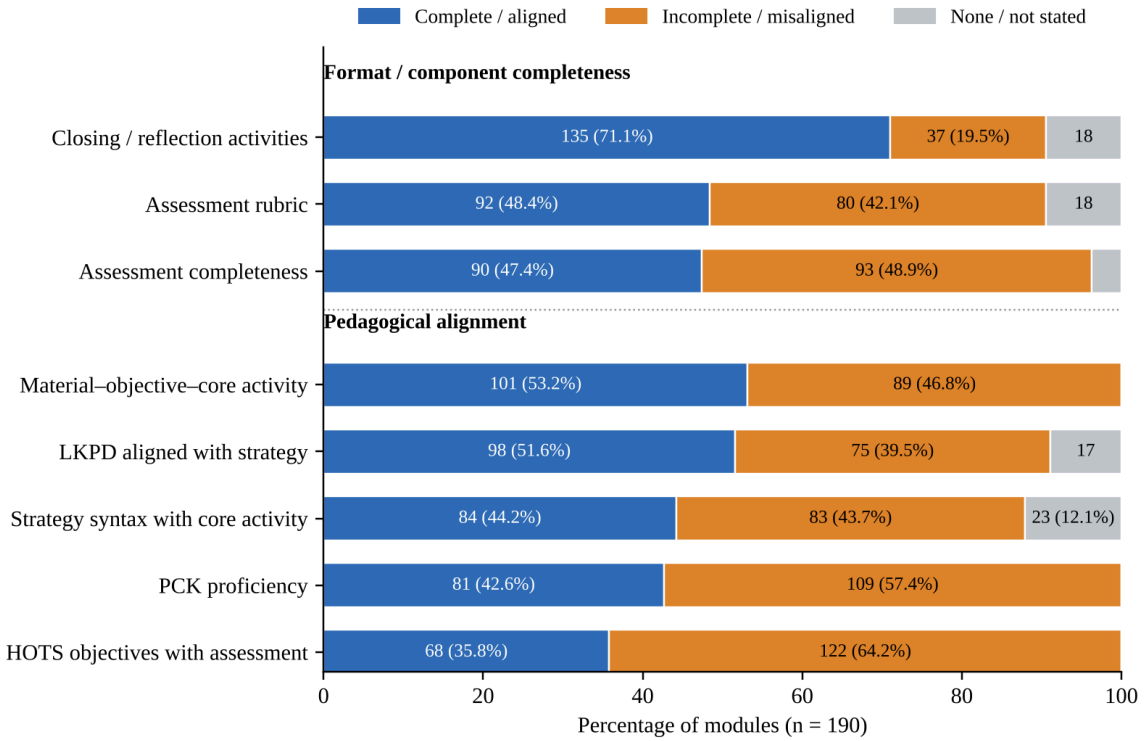


Figure 4. Share of the 190 teaching modules that were complete or aligned, incomplete or misaligned, or silent on each of eight indicators (frequencies in Appendix Table A1).

a single component were the most consistently fulfilled, with closing and reflection activities present in 71.1% of modules. Indicators that require several components to be coordinated were met far less often: only 35.8% of modules aligned HOTS-level objectives with assessment items, and strategy syntax, content mastery, and assessment completeness each divided the modules almost evenly between aligned and non-aligned. Pedagogical content knowledge followed the same direction, with proficiency in fewer than half of the modules.

To show how these codes are distributed across teachers rather than only across indicators, each module was also scored on two sets of indicators, each coded 1 (complete or aligned) or 0 (incomplete, misaligned, or not stated). Component completeness comprised assessment completeness, the assessment rubric, and closing or reflection activities (0–3); alignment comprised LKPD aligned with the stated strategy, material–objective–core activity alignment, strategy syntax synchronized with the core activity, HOTS objectives aligned with assessment items, and PCK proficiency (0–5). Figure 5 plots each module's two scores against each other. Completeness and alignment were positively related (Spearman $\rho = .54$, $p < .001$), but completeness did not guarantee alignment. Of the 100 modules meeting at least two of the three completeness indicators, 22 met at most one alignment indicator, whereas only 20 modules (10.5%) were both fully complete and fully aligned. Alignment was polarised rather than evenly spread: 62 modules (32.6%) met none of the five alignment indicators and 43 (22.6%) met all five, whereas completeness was concentrated at the upper end (49 modules, 25.8%, met all three indicators; 22, 11.6%, met none). Expressed as the percentage of indicators met, completeness (median 66.7%, interquartile range 33.3–100.0) exceeded alignment (median 40.0%, 0–80.0) within the same modules (Wilcoxon signed-rank $W = 4{,}329$, $p = .001$).

The translation of a stated strategy into core activities was examined among the 129 modules that named Problem-Based Learning (PBL) as their strategy. The core-activity steps of 80 modules (62.0%) were consistent with PBL syntax, those of 33 modules (25.6%) matched it only partially, and the remaining 16 (12.4%) did not match it (7 modules) or could not be identified (9 modules). This check compares the core-activity steps with the syntax of the stated strategy among PBL modules, whereas the syntax indicator in Figure 4 records, for all 190 modules, whether the stated strategy and the core activities were synchronized (84 modules, 44.2%); the two measures are related but not identical.

LKPD alignment was coded as aligned when the worksheet operationalized the stated strategy's syntax (for PBL, a different case for each group within the same material context, with the number of cases adjusted to the number of groups) and as misaligned when it did not (for PBL, group work consisting of practice questions identical across groups, with no case presented). Representative verbatim excerpts illustrating both codes are given in Table 1.

Table 1. Presents verbatim excerpts from one aligned and one misaligned module

Code	Coding	Verbatim excerpt (Indonesian)	English translation	Analytic note
DM-105	Aligned	Syntax 3: "*Guru membimbing peserta didik untuk terlibat aktif menganalisis informasi tentang masalah-masalah yang ada di LKPD*." LKPD: "*Apabila anda menjadi sosiolog, peran apa yang akan anda pilih … Solusi apa yang akan anda berikan …?*"	Syntax 3: "The teacher guides students to actively analyze information about the problems in the LKPD." LKPD: "If you were a sociologist, which role would you choose … What solution would you give …?"	Three LKPD versions each present a case image. Students act as sociologists, analyze the case, and propose solutions, operationalizing the PBL problem-orientation, investigation, and solution phases.
DM-98	Misaligned	Phase 2: "*Setiap kelompok diberi topik: Tokoh Sosiologi. Mereka diminta untuk mengidentifikasi tokoh masing-masing*." LKPD: "*3 Tokoh Sosiologi Yaitu Max Weber / Pitirim A. Sorokin / William F. Ogburn & Meyer F.Nimkoff*"	Phase 2: "Each group is given the topic 'Sociological Figures'. They are asked to identify their respective figures." LKPD: "Three Sociological Figures, Namely Max Weber / Pitirim A. Sorokin / William F. Ogburn & Meyer F. Nimkoff"	Phase labels reproduce PBL syntax, but no problem is posed. The task is to identify figures (recall), and the worksheet lists names only, with no question, case, or investigation task.

TPACK integration: content, pedagogy, and technology

In line with the subject-matter pattern above, content selection leaned toward concrete topics close to students' everyday social experience (Social Interaction, Social Problems, Social Change) rather than abstract disciplinary foundations (Sociology as a Discipline, Social Symptoms). In technology integration, fewer teachers used platforms such as Quizizz or Wordwall to create interactive assessment activities, and some modules mentioned no technology at all (Figure 3b).

Document-level irregularities in the technology and related components were captured during open coding of the component-mapping extracts (media and technology use, learning steps, and assessment) and are tabulated for all 190 modules in Table 2, so that they can be read as systematic counts rather than selectively chosen anecdotes. Twenty-six modules attached

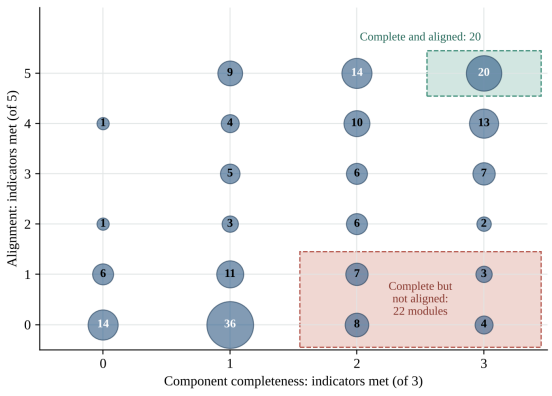


Figure 5. Distribution of the 190 modules by completeness score (0–3) and alignment score (0–5). Bubble area is proportional to the number of modules; shaded boxes mark modules that are complete but not aligned (at least 2 completeness indicators and at most 1 alignment indicator) and modules that are complete and aligned (all indicators).

Table 2. Recapitulation of document anomalies identified across the 190 teaching modules

Anomaly	Component (coding stage)	Modules
Video link contains a read-aloud slideshow instead of a case video	Instructional media/technology	26
Google Drive video link inaccessible	Instructional media/technology	12
No measurable learning objective (material details only)	Learning objectives	5
No trigger question	Core component: apperception	27
Trigger question asks directly for the day's target knowledge	Core component: apperception	11
PBL stated, but group task is identical practice questions without a case	LKPD / learning steps	17
No technology mentioned	Technology use	24

Note. Counts refer to the number of modules (out of 190) showing each anomaly. A module may show more than one anomaly, so counts are not additive. Percentages are n/190.

video links that contained a slideshow of material read aloud rather than a case video, and twelve attached Google Drive links that could not be accessed.

Empirical Patterns Relevant to a Critical Reading of Teacher Performance (RQ2)

Three patterns in the results provide the empirical basis for the critical reading developed in the Discussion. First, low-to-moderate cognitive objectives (Figure 1) coexist with a majority mismatch between stated HOTS objectives and assessment items (Figure 4). Second, teachers tend to select subject matter and instructional strategies that are easier to contextualize, while topics that demand deeper disciplinary mastery are comparatively avoided (Sections 1a and 1c). Third, the technology component is almost always formally present yet concentrated in a single presentation tool and, in a documented set of modules, non-functional (Figure 3, Table 2). Together with the generally high completeness of administrative components such as trigger questions, closing activities, and media inclusion (Sections 1a and 1b; Figures 3 and 4), these patterns form the empirical foundation for the interpretation that follows.

Administrative Completeness versus Pedagogical Depth in Light of Prior TPACK Research

The results indicate a consistent pattern: Sociology teachers' ability to compose a teaching module's administrative framework is stronger than their ability to translate it into coherent, HOTS-oriented, and technologically integrated pedagogical practice. This extends earlier research on performance-based assessment and teacher TPACK, which has tended to be quantitative-descriptive and to stop at mapping readiness, perceptions, or competency attainment (Angeli & Valanides, 2009; Koh et al., 2010; Seifert & Lindmeier, 2024; Yang & Wei, 2025; Yue et al., 2024). While those studies measure teacher readiness, our findings show that format completeness can coexist with considerable unevenness in the substance beneath it, a distinction readiness scales are not designed to capture.

The gap can be read through constructive alignment (Biggs, 1996; Biggs & Tang, 2011): when objectives, activities, and assessment do not cohere, a document may be complete yet invite the surface approaches to learning described by Marton and Säljö (1976). The frequent mismatch between HOTS-worded objectives and assessment items is especially consequential, because higher-order thinking can only be validly measured through instruments designed to elicit analysis, evaluation, and creation (Anderson & Krathwohl, 2001; Krathwohl, 2002; cf. Zohar & Dori, 2003). The partial translation of strategy into core-activity syntax can likewise be interpreted through Kolb's (1984) experiential learning cycle: trigger questions and reflective closings suggest an intention to build a reflective cycle, but where the LKPD and core activities depart from the strategy's syntax, the stages of concrete experience and active experimentation are weakly designed. Moderate PCK proficiency (Shulman, 1986) further limits meaningful learning in Ausubel et al.'s (1978) sense, which depends on connecting new concepts to students' existing knowledge structures.

Teachers' preference for concrete, easily contextualized topics is consistent with the logic of PBL, which relies on real phenomena as

problem triggers (Hmelo-Silver, 2004; Hmelo-Silver et al., 2007), and may signal greater confidence in common content knowledge than in the specialized content knowledge (Ball & Forzani, 2009; Ball et al., 2008) needed to teach abstract disciplinary foundations. The concentration of technology in a single presentational tool probably reflects practical and evaluative convenience as much as pedagogical design: a slide deck is inexpensive to prepare, widely available, and readily recognised by assessors as evidence that media and technology have been addressed, whereas interactive, student-centred tools require redesigning the learning task itself (Harris et al., 2009; Harris & Hofer, 2011), in line with evidence that teachers' pedagogical beliefs shape how technology is used (Ertmer et al., 2012; Tondeur et al., 2017). This reading is consistent with Koehler and Mishra's (2009) argument that TPACK is a competence developed through repeated, reflective design and enactment (Koehler & Mishra, 2005; Niess, 2005; Rosenberg & Koehler, 2015), which a document uploaded once is ill-suited to capture. Overall, while earlier studies mapped competency on paper, the present study shows that the same completeness may mask a substantial, otherwise undetected gap in pedagogical depth.

A Critical Reading of Teacher Performance: Freire, Giroux, and Ball

The consistent gap above is the entry point for reading the UKIN document not as a neutral mirror of competence but as an artifact shaped by the logic of the assessment system. Three critical perspectives are applied in turn. Each is used to interpret planning-level evidence, not to make claims about classroom enactment (see the boundaries of inference at the end of this section).

First, Freire's (1970/2007) critique of banking education can help us read the predominance of low-to-moderate cognitive objectives, in which students are positioned as recipients of deposited information, with little room for dialogue or *conscientization*. The irony is that this pattern appears in Sociology, a discipline that emerged from critical readings of social structure and inequality. The parallel gap between increasingly HOTS-worded objectives and assessment instruments that lack HOTS suggests that HOTS vocabulary may function as a language of compliance with curricular and rubric demands, without a corresponding change in assessment design. For Freire, liberating education requires dialogue and problem-posing rather than information transfer assessed at a basic cognitive level (Bartlett, 2005; Giroux, 2010). This interpretation must nevertheless be handled with caution. A planning document records intended learning, not what happens in the classroom: a teacher who writes C1–C2 objectives may well enact dialogical, problem-posing lessons, just as a teacher who writes C4 objectives may lecture. We therefore treat banking education here as a pattern in the design logic encoded in the documents and as a risk for classroom practice, not as evidence that these teachers practice banking education.

Second, within Giroux's (1988) framework of teachers as transformative intellectuals, teachers ideally design reflective, critical learning that empowers students to read and challenge the social structures around them. The comparatively limited selection of topics that carry the discipline's critical-thinking framework, together with reliance on a single, administratively safe instructional strategy, places teachers in these documents closer to curriculum technicians than to transformative intellectuals. This is not read as an individual shortcoming but as a plausible structural consequence of a system that demands compliance with strict time, format, and rubric requirements and thereby narrows the room for critical pedagogical experimentation (cf. Biesta et al., 2015).

Third, Ball's (2003) theory of performativity explains how accountability regimes encourage *fabrications*, representations composed to satisfy indicators that may diverge from authentic practice. Several mechanisms may explain why UKIN documents risk becoming fabrications rather than mirrors. First, the rubric operates as a checklist that rewards the presence of components (a trigger question, media, a reflective closing, a technology element) more readily than their coherence, so that under high stakes the rational strategy is to make every box visibly filled. Second, verification is asymmetric: presence is cheap to check, whereas coherence among objectives, activities, and assessment, or whether a linked video actually supplies a case for discussion, demands slower substantive reading that a one-shot, final-product submission rarely receives. Third, the stakes and the one-time nature of the submission discourage experimentation, since a familiar strategy and a recognizable template are less risky than an innovative design judged against criteria the teacher cannot fully anticipate. Under these conditions, non-functional technology elements, such as links that do not open or do not contain the case they are said to supply, are best understood as the visible residue of a logic in which a component's presence, rather than its function, satisfies the assessor (Figure 6). Because the authors' intentions cannot be observed, such anomalies may also reflect haste or limited digital

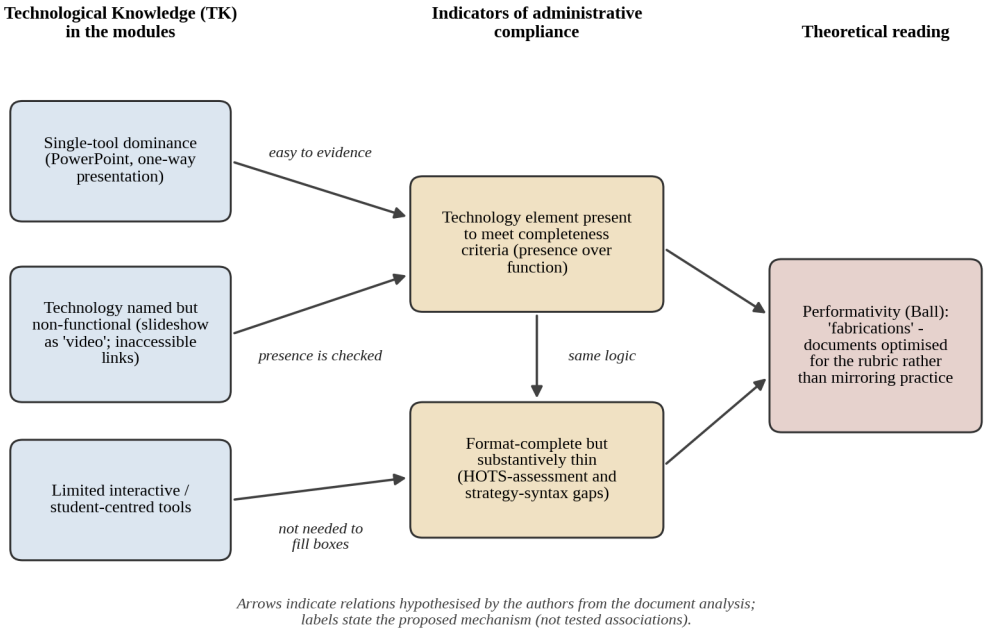


Figure 6. Thematic map linking technological knowledge in the teaching modules to indicators of administrative compliance and to the performativity reading (analytic synthesis by the authors). Arrows denote hypothesized relations, and the labels state the proposed mechanism

skill; the performativity reading therefore offers the most coherent structural explanation of the overall pattern, not proof of intent in any single document.

This reading dialogues with, and is in part supported by, studies of performativity in Asian competency-oriented systems. Luo and Chan (2024), analyzing China's policies for assessing students' holistic development, caution that management cultures and performance indicators can push competency assessment into the pitfall of performativity, which parallels our finding that a competency-oriented curriculum assessed through documents can reward visible compliance. Liu and Wong (2026), drawing on interviews with preschool teachers and administrators and on document analysis in China, report conflicts between performer and caring-professional identities that they attribute to hierarchical management and a pervasive performative culture. Our document-based evidence aligns with these pressures but, unlike theirs, cannot show how teachers experience them. Within Indonesia, the vulnerability of portfolio-based certification to manipulation (Haryanto et al., 2016) and, in other Global South settings, the spread of accountability regimes that privilege visible compliance (van Wyk & le Grange, 2017; de la Vega Rodríguez & Carrasco-Aguilar, 2026) point in the same direction. However, not all evidence aligns. Frostenson and Englund (2020), studying Swedish teachers, found that teachers could reconcile humanistic professional values with performative techniques by reinterpreting those values in performative terms. Seen in this light, the reflective closings and trigger questions found in many modules need not be mere fabrications; they may be sincere pedagogical intentions expressed in the language the system rewards. Our data cannot adjudicate between these readings, underscoring the need to triangulate with classroom evidence.

Read together, the three perspectives suggest that performance-based assessment, such as the UKIN, has ambivalent potential. On one hand, authentic artifacts can capture professional competence more richly than conventional written tests (Darling-Hammond & Snyder, 2000; Blomberg et al., 2013). On the other hand, without verification that goes beyond checking format completeness, such a system risks reinforcing performativity, in which teachers, as rational actors in a high-stakes system, produce documents that are administratively safe rather than faithful to their pedagogical thinking. This distances teachers from Giroux's transformative intellectual and from Freire's dialogical education, and it entrenches the performance document as an instrument of compliance rather than a mirror of competence. Strengthening teacher quality in service of SDG 4 therefore cannot rest on document completeness alone; it requires assessment designs that allow authentic reflection, ongoing professional

dialogue, and process-based supervision rather than one-time, final-product verification.

Three boundaries qualify these interpretations. First, teaching modules are planning artifacts that show intended practice and the teacher's self-representation, not enacted classroom interaction, so documents alone cannot support claims that teachers practice banking education or fabricate practice. Second, the single FGD with assessors enriches the interpretation but remains second-hand evidence, not classroom observation. Third, the purposive sample covers participants of one LPTK and is a non-random subset of the 420 participants, so patterns may differ elsewhere. Future research should pair document analysis with recorded teaching practice, lesson observation, and teacher interviews to test whether planning-level patterns correspond to classroom practice.

■ CONCLUSION

This study concludes that the teaching modules of Sociology teachers who took the 2025 In-Service Teacher UKIN are generally fairly complete in their administrative and structural aspects. However, their alignment with learning-practice indicators within the TPACK framework remains uneven, leaving a gap between what the text states and a pedagogical design that genuinely integrates content mastery, teaching strategy, and technology use. Read through Freire, Giroux, and Ball, this gap appears to be less a matter of individual teacher competence than a consequence of an assessment logic that rewards the presence of components more readily than their coherence, so that UKIN documents risk functioning as representations of administrative compliance rather than as mirrors of pedagogical reasoning. However, these planning-level findings from one LPTK do not establish how teachers actually teach. To reduce this performativity effect, PPG policymakers should revise UKIN rubrics and assessor training to judge the coherence of objectives, activities, and assessment, and to verify that linked media actually serve their stated pedagogical purpose. At the same time, LPTK should complement one-time submission with iterative mentoring and a short reflective component linked to the recorded teaching practice, so that the UKIN documents design reasoning rather than administrative compliance and better supports the aim of quality education under SDG 4.

■ ACKNOWLEDGMENT

The authors express their gratitude to the Research and Community Service *Institution (Lembaga Penelitian dan Pengabdian Kepada Masyarakat* or LPPM), Universitas Sebelas Maret, for funding this research through the Research Group Grant (*Hibah Grup Riset*) with contract number 460/UN27.22/PT.01.03/2026, dated April 16, 2026.

■ DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN SCIENTIFIC WRITING

During the preparation of this work, the authors used Claude Sonnet 5.5 (Anthropic) and Grammarly. Claude Sonnet 5.5 was used to (i) organize and tabulate the document-coding data exported from the online form and compute the descriptive statistics, (ii) produce the figures from those data, (iii) check the consistency of in-text citations against the reference list and the APA 7 formatting of references, and (iv) edit the language, structure, and clarity of the manuscript in response to editor and reviewer comments. Grammarly was used only for grammar, spelling, and style editing. Coding of the 190 documents was performed manually by the authors, as described in the Data Analysis section; the tools were not used to code the documents. After using these tools, the authors reviewed and edited all outputs as needed and take full responsibility for the content of the publication, including its accuracy, integrity, and originality.

■ REFERENCES

Abbitt, J. (2011). Measuring technological pedagogical content knowledge in preservice teacher education: A review of current methods and instruments. *Journal of Research on Technology in Education, 43*(4), 281–300. https://doi.org/10.1080/15391523.2011.10782573

Anderson, L. W., & Krathwohl, D. R. (Eds.). (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives*. Longman.

Angeli, C., & Valanides, N. (2009). Epistemological and methodological issues for the conceptualization, development, and assessment of ICT–TPCK: Advances in technological pedagogical content knowledge (TPCK). *Computers & Education, 52*(1), 154–168. https://doi.org/10.1016/j.compedu.2008.07.006

Ausubel, D. P., Novak, J. D., & Hanesian, H. (1978). *Educational psychology: A cognitive view* (2nd ed.). Holt, Rinehart & Winston.

Ball, D. L., & Forzani, F. M. (2009). The work of teaching and the challenge for teacher education. *Journal of Teacher Education, 60*(5), 497–511. https://doi.org/10.1177/0022487109348479

Ball, D. L., Thames, M. H., & Phelps, G. (2008). Content knowledge for teaching: What makes it special? *Journal of Teacher Education, 59*(5), 389–407. https://doi.org/10.1177/0022487108324554

Ball, S. J. (2003). The teacher's soul and the terrors of performativity. *Journal of Education Policy, 18*(2), 215–228. https://doi.org/10.1080/0268093022000043065

Bartlett, L. (2005). Dialogue, knowledge, and teacher-student relations: Freirean pedagogy in theory and practice. *Comparative Education Review, 49*(3), 344–364. https://doi.org/10.1086/430261

Biesta, G., Priestley, M., & Robinson, S. (2015). The role of beliefs in teacher agency. *Teachers and Teaching, 21*(6), 624–640. https://doi.org/10.1080/13540602.2015.1044325

Biggs, J. (1996). Enhancing teaching through constructive alignment. *Higher Education, 32*(3), 347–364. https://doi.org/10.1007/BF00138871

Biggs, J., & Tang, C. (2011). *Teaching for quality learning at university* (4th ed.). McGraw-Hill Education.

Blomberg, G., Sherin, M. G., Renkl, A., Glogger, I., & Seidel, T. (2013). Understanding video as a tool for teacher education: Investigating instructional strategies to promote reflection. *Instructional Science, 41*(3), 443–463. https://doi.org/10.1007/s11251-012-9231-4

Bostean, G., & Leitz, L. (2022). Using sociological images to develop the sociological imagination. *Teaching Sociology, 50*(2), 122–135. https://doi.org/10.1177/0092055X211054572

Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal, 9*(2), 27–40. https://doi.org/10.3316/QRJ0902027

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health, 11*(4), 589–597. https://doi.org/10.1080/2159676X.2019.1628806

Campbell, J. L., Quincy, C., Osserman, J., & Pedersen, O. K. (2013). Coding in-depth semistructured interviews: Problems of unitization and intercoder reliability and agreement. *Sociological Methods & Research, 42*(3), 294–320. https://doi.org/10.1177/0049124113500475

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.

Darling-Hammond, L. (2000). Teacher quality and student achievement. *Education Policy Analysis Archives, 8*, Article 1. https://doi.org/10.14507/epaa.v8n1.2000

Darling-Hammond, L., & Snyder, J. (2000). Authentic assessment of teaching in context. *Teaching and Teacher Education, 16*(5–6), 523–545. https://doi.org/10.1016/S0742-051X(00)00015-9

de la Vega Rodríguez, L. F., & Carrasco-Aguilar, C. L. (2026). Performative accountability: A close examination of a dominant model. In L. F. de la Vega Rodríguez & C. L. Carrasco Aguilar (Eds.), *Contesting educational accountability research* (pp. 1–14). Springer. https://doi.org/10.1007/978-3-032-16112-3_1

Elo, S., & Kyngäs, H. (2008). The qualitative content analysis process. *Journal of Advanced Nursing, 62*(1), 107–115. https://doi.org/10.1111/j.1365-2648.2007.04569.x

Ertmer, P. A., Ottenbreit-Leftwich, A. T., Sadik, O., Sendurur, E., & Sendurur, P. (2012). Teacher beliefs and technology integration practices: A critical relationship. *Computers & Education, 59*(2), 423–435. https://doi.org/10.1016/j.compedu.2012.02.001

Fobes, C., & Kaufman, P. (2008). Critical pedagogy in the sociology classroom: Challenges and concerns. *Teaching Sociology, 36*(1), 26–33. https://doi.org/10.1177/0092055X0803600104

Freire, P. (2007). *Pedagogy of the oppressed* (30th anniversary ed.; M. B. Ramos, Trans.). Continuum. (Original work published 1970)

Frostenson, M., & Englund, H. (2020). Teachers, performative techniques and professional values: How performativity becomes humanistic through interplay mechanisms. *Cambridge Journal of Education, 50*(6), 695–710. https://doi.org/10.1080/0305764X.2020.1761943

Giroux, H. A. (1988). *Teachers as intellectuals: Toward a critical pedagogy of learning*. Bergin & Garvey.

Giroux, H. A. (2010). Rethinking education as the practice of freedom: Paulo Freire and the promise of critical pedagogy. *Policy Futures in Education, 8*(6), 715–721. https://doi.org/10.2304/pfie.2010.8.6.715

Graham, C. R. (2011). Theoretical considerations for understanding technological

pedagogical content knowledge (TPACK). *Computers & Education, 57*(3), 1953–1960. https://doi.org/10.1016/j.compedu.2011.04.010

Hanushek, E. A., & Rivkin, S. G. (2012). The distribution of teacher quality and implications for policy. *Annual Review of Economics, 4*, 131–157. https://doi.org/10.1146/annurev-economics-080511-111001

Harris, J., Mishra, P., & Koehler, M. J. (2009). Teachers' technological pedagogical content knowledge and learning activity types: Curriculum-based technology integration reframed. *Journal of Research on Technology in Education, 41*(4), 393–416. https://doi.org/10.1080/15391523.2009.10782536

Harris, J. B., & Hofer, M. J. (2011). Technological pedagogical content knowledge (TPACK) in action: A descriptive study of secondary teachers' curriculum-based, technology-related instructional planning. *Journal of Research on Technology in Education, 43*(3), 211–229. https://doi.org/10.1080/15391523.2011.10782570

Haryanto, E., Mukminin, A., Murboyono, R., Muazza, M., & Ekatina, M. (2016). Teacher certification policy in Indonesia: Evidence from certified English teachers at one public high school. *Turkish Online Journal of Qualitative Inquiry, 7*(3), 224–244. https://doi.org/10.17569/tojqi.31703

Hill, C. E., Thompson, B. J., & Williams, E. N. (1997). A guide to conducting consensual qualitative research. *The Counseling Psychologist, 25*(4), 517–572. https://doi.org/10.1177/0011000097254001

Hmelo-Silver, C. E. (2004). Problem-based learning: What and how do students learn? *Educational Psychology Review, 16*(3), 235–266. https://doi.org/10.1023/B:EDPR.0000034022.16470.f3

Hmelo-Silver, C. E., Duncan, R. G., & Chinn, C. A. (2007). Scaffolding and achievement in problem-based and inquiry learning: A response to Kirschner, Sweller, and Clark (2006). *Educational Psychologist, 42*(2), 99–107. https://doi.org/10.1080/00461520701263368

Hsieh, H.-F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research, 15*(9), 1277–1288. https://doi.org/10.1177/1049732305276687

Kementerian Pendidikan Dasar dan Menengah. (2025). *Panduan pembelajaran dan asesmen* (Edisi revisi) [Guidelines for learning and assessment]. https://kurikulum.kemendikdasmen.go.id/file/1755668120_manage_file.pdf#page=16.35

Koehler, M. J., & Mishra, P. (2005). What happens when teachers design educational technology? The development of technological pedagogical content knowledge. *Journal of Educational Computing Research, 32*(2), 131–152. https://doi.org/10.2190/0EW7-01WB-BKHL-QDYV

Koehler, M. J., & Mishra, P. (2009). What is technological pedagogical content knowledge? *Contemporary Issues in Technology and Teacher Education, 9*(1), 60–70. https://citejournal.org/volume-9/issue-1-09/general/what-is-technological-pedagogicalcontent-knowledge

Koh, J. H. L., Chai, C. S., & Tsai, C. C. (2010). Examining the technological pedagogical content knowledge of Singapore pre-service teachers with a large-scale survey. *Journal of Computer Assisted Learning, 26*(6), 557–563. https://doi.org/10.1111/j.1365-2729.2010.00372.x

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Prentice Hall.

Krathwohl, D. R. (2002). A revision of Bloom's taxonomy: An overview. *Theory Into Practice, 41*(4), 212–218. https://doi.org/10.1207/s15430421tip4104_2

Krippendorff, K. (2018). *Content analysis: An introduction to its methodology* (4th ed.). SAGE Publications. https://doi.org/10.4135/9781071878781

Liu, T., & Wong, J. L. N. (2026). Performer versus caring professional: Identity conflicts of preschool teachers in the context of performative culture in mainland China. *Educational Review, 78*(3), 315–332. https://doi.org/10.1080/00131911.2025.2486755

Luo, J., & Chan, C. K. Y. (2024). Assessing students' holistic development in China: Managerialism, market, and performativity as policy technologies. *Asia Pacific Education Review, 25*(4), 885–895. https://doi.org/10.1007/s12564-023-09842-4

Marton, F., & Säljö, R. (1976). On qualitative differences in learning: I—Outcome and process. *British Journal of Educational Psychology, 46*(1), 4–11. https://doi.org/10.1111/j.2044-8279.1976.tb02980.x

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record, 108*(6), 1017–1054. https://doi.org/10.1111/j.1467-9620.2006.00684.x

Moore, H. L. (2015). Global prosperity and sustainable development goals. *Journal of International Development, 27*(6), 801–815. https://doi.org/10.1002/jid.3114

Morgan, D. L. (1996). Focus groups. *Annual Review of Sociology, 22*, 129–152. https://doi.org/10.1146/annurev.soc.22.1.129

Niess, M. L. (2005). Preparing teachers to teach science and mathematics with technology: Developing a technology pedagogical content knowledge. *Teaching and Teacher Education, 21*(5), 509–523. https://doi.org/10.1016/j.tate.2005.03.006

Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis: Striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods, 16*(1), Article 1609406917733847. https://doi.org/10.1177/1609406917733847

OECD. (2025). *Unlocking high-quality teaching*. OECD Publishing. https://doi.org/10.1787/f5b82176-en

Palmer, N. (2023). The sociological imagination within Teaching Sociology: 1973–2020. *Teaching Sociology, 51*(1), 1–12. https://doi.org/10.1177/0092055X221098452

Pecheone, R. L., & Chung, R. R. (2006). Evidence in teacher education: The Performance Assessment for California Teachers (PACT). *Journal of Teacher Education, 57*(1), 22–36. https://doi.org/10.1177/0022487105284045

Rosenberg, J. M., & Koehler, M. J. (2015). Context and technological pedagogical content knowledge (TPACK): A systematic review. *Journal of Research on Technology in Education, 47*(3), 186–210. https://doi.org/10.1080/15391523.2015.1052663

Sato, M. (2014). What is the underlying conception of teaching of the edTPA? *Journal of Teacher Education, 65*(5), 421–434. https://doi.org/10.1177/0022487114542518

Schmidt, D. A., Baran, E., Thompson, A. D., Koehler, M. J., Mishra, P., & Shin, T. (2009). Technological pedagogical content knowledge (TPACK): The development and validation of an assessment instrument for preservice teachers. *Journal of Research on Technology in Education, 42*(2), 123–149. https://doi.org/10.1080/15391523.2009.10782544

Seifert, H., & Lindmeier, A. (2024). Developing a performance-based assessment to measure pre-service secondary teachers' digital competence to use digital mathematics tools. *Journal für Mathematik-Didaktik, 45*(2), Article 25. https://doi.org/10.1007/s13138-024-00251-7

Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher, 15*(2), 4–14. https://doi.org/10.3102/0013189X015002004

Shulman, L. S. (1987). Knowledge and teaching: Foundations of the new reform. *Harvard Educational Review, 57*(1), 1–23. https://doi.org/10.17763/haer.57.1.j463w79r56455411

Stafford-Smith, M., Griggs, D., Gaffney, O., Ullah, F., Reyers, B., Kanie, N., Stigson, B., Shrivastava, P., Leach, M., & O'Connell, D. (2017). Integration: The key to implementing the Sustainable Development Goals. *Sustainability Science, 12*(6), 911–919. https://doi.org/10.1007/s11625-016-0383-3

Tondeur, J., van Braak, J., Ertmer, P. A., & Ottenbreit-Leftwich, A. (2017). Understanding the relationship between teachers' pedagogical beliefs and technology use in education: A systematic review of qualitative evidence. *Educational Technology Research and Development, 65*(3), 555–575. https://doi.org/10.1007/s11423-016-9481-2

UNESCO. (2024). *Global report on teachers: Addressing teacher shortages and transforming the profession*. United Nations. https://doi.org/10.18356/9789231006555

United Nations General Assembly. (2015). *Transforming our world: The 2030 Agenda for Sustainable Development* (A/RES/70/1). United Nations. https://digitallibrary.un.org/record/3923923

Unterhalter, E. (2019). The many meanings of quality education: Politics of targets and indicators in SDG4. *Global Policy, 10*(S1), 39–51. https://doi.org/10.1111/1758-5899.12591

van Wyk, M., & le Grange, L. (2017). Performatiwiteit as verskynsel in die onderwys [Performativity as phenomenon in education]. *LitNet Akademies, 14*(2), 540–564. http://hdl.handle.net/10019.1/104152

Voogt, J., Fisser, P., Pareja Roblin, N., Tondeur, J., & van Braak, J. (2013). Technological pedagogical content knowledge – a review of the literature. *Journal of Computer Assisted Learning, 29*(2), 109–121. https://doi.org/10.1111/j.1365-2729.2012.00487.x

Yang, J., & Wei, H. (2025). Development of a scale of teachers' perceived training quality from the perspective of TPACK. *Humanities and Social Sciences*

Communications, 12, Article 34. https://doi.org/10.1057/s41599-024-04271-z

Yue, M., Jong, M. S.-Y., & Ng, D. T. K. (2024). Understanding K–12 teachers' technological pedagogical content knowledge readiness and attitudes toward artificial intelligence education. *Education and Information Technologies, 29*, 19505–19536. https://doi.org/10.1007/s10639-024-12621-2

Zohar, A., & Dori, Y. J. (2003). Higher order thinking skills and low-achieving students: Are they mutually exclusive? *Journal of the Learning Sciences, 12*(2), 145–181. https://doi.org/10.1207/S15327809JLS1202_1