



From Plan–Do–See to Real Differentiation: Tracing Teachers’ Shifts in Differentiated Instruction Across Lesson Study (A Case Study in Vocational High Schools)

**Rahmawati Upa¹, Paldy², Opik Dwi Indah³, Suci Damayanti⁴,
Nurthasya⁵**

^{1, 2, 3, 4, 5} Cokroaminoto University of Palopo, Indonesia
email: rahmawatiupa22@gmail.com

Abstract: *This study traces teachers’ shifts in differentiated instruction across three Lesson Study (Plan–Do–See) cycles in a vocational high school context through an open-class program on fantasy text learning. Using a qualitative case study approach, the research examines differentiated instruction as it emerged through iterative redesign of (a) grouping arrangements, (b) tiered group tasks aligned with students’ readiness, and (c) teacher responsiveness to passive individuals during group work. Data were collected across planning, implementation, and reflection stages, including lesson plans and revised materials, classroom observation notes focused on participation patterns, and records of post-lesson reflection discussions. Findings indicate a clear developmental trajectory across cycles. In Cycle I, heterogeneous grouping was associated with unequal participation, as higher-ability students dominated discussion and presentation while lower-ability students remained largely silent. In Cycle II, redesign toward homogeneous grouping combined with tiered group tasks was linked to increased participation among previously passive students, particularly within lower-ability groups. In Cycle III, differentiation was strengthened further through deliberate teacher attention to passive individuals across all ability groups, indicating a shift from group-level differentiation to more responsive, individual-level support. The study highlights how Lesson Study can function as an evidence-based redesign mechanism for developing “real differentiation” in vocational classrooms by progressively refining learning conditions, task calibration, and in-the-moment teacher responsiveness. Practical implications emphasize evaluating grouping assumptions, integrating grouping with tiered tasks, monitoring passivity at the individual level, and using the “See” stage to anchor redesign in concrete participation evidence.*

Keywords: *differentiated instruction; lesson study; vocational high school.*

INTRODUCTION

Vocational high schools are increasingly characterized by wide variation in students’ prior knowledge, learning pace, motivation, and career aspirations. This diversity is not incidental; it is embedded in vocational pathways that bring together students with different academic histories and occupational interests. In such contexts, differentiated instruction (DI) becomes a practical equity strategy: teachers are expected to proactively adapt content, process, learning products, and learning supports so that students can access common curricular goals through

different routes. Recent evidence also shows that DI is strongly shaped by classroom realities (e.g., class size) and teachers’ guiding principles and beliefs, highlighting that DI is not merely a “set of techniques,” but a complex, situated instructional practice. (Bi et al., 2023).

However, implementing DI consistently remains challenging. Reviews of DI related teacher education and professional development indicate that many initiatives are short lived or focus on surface level strategies, while the most successful efforts tend to be active, collaborative, reflective, and sustained over time, supporting not only teachers’ knowledge and skills but also their beliefs and instructional decision-making (Langelaan et al., 2024). At the same time, DI can intensify teachers’ workload and emotional demands; empirical work has linked DI-related implementation pressures to teacher stress and job satisfaction, underscoring that “doing DI well” requires robust professional learning supports and workable school conditions (Pozas et al., 2023).

These challenges are especially salient in vocational education, where DI may be even more critical yet still under-explored. Research focusing specifically on DI in vocational education remains limited, and available evidence suggests that while DI principles transfer into vocational settings, they often require context-sensitive enactment and face distinctive implementation constraints that professional development must address. This gap is consequential: vocational teachers are expected to support diverse learners while also meeting competency demands and industry-aligned outcomes, making it important to understand not only whether DI is promoted, but how teachers actually shift their practices over time in real vocational classrooms.

One professional development approach that aligns closely with the conditions needed for meaningful DI growth is lesson study. Lesson study is widely recognized as a collaborative, inquiry-oriented model in which teachers jointly plan a “research lesson,” teach and observe it, and then reflect systematically on evidence of student learning to revise instruction. Global accounts emphasize lesson study’s ongoing expansion and its role in fostering teacher learning through cycles of joint planning, classroom observation, and reflective discussion (R Upa, et al., 2024, Suardi, et al., 2021, R Upa et al., 2024). In parallel, research also highlights lesson study’s potential to cultivate teacher community and professional growth, suggesting that collaborative cultures formed through lesson study can strengthen sustained instructional change rather than one-off experimentation (Ní Shúilleabháin et al., 2024, R Upa, et al., 2024).

Nevertheless, lesson study implementation varies across contexts, and methodological reviews have raised concerns about how transparently lesson study research reports its designs, evidence, and analytic decisions issues that can obscure the mechanisms through which teacher learning happens (Kager et al., 2024). Addressing this requires studies that trace teacher learning with clear documentation across cycles, especially when the target is a complex instructional practice like DI. Additionally, innovations such as technology-supported lesson study formats indicate growing interest in making collaborative inquiry more scalable and

sustainable; for example, hybrid models that integrate video-based collaborative analysis can provide “differentiated” professional learning opportunities while maintaining the core lesson study logic of evidence-based reflection (Capone R., 2023).

Despite the conceptual fit between DI and lesson study, empirical work that tracks teachers’ shifts in differentiated instruction across multiple lesson study cycles, particularly in vocational high schools, remains scarce. Recent work in EFL contexts shows that lesson study can serve as a structured pathway for teachers to reflect on and develop differentiated practices (R Upa, et al., 2024), yet we still need fine-grained accounts of how DI evolves across repeated Plan–Do–See cycles: What changes first teachers’ planning decisions, their in-class responsiveness, their grouping practices, or their assessment-for-learning routines? Which supports within lesson study (peer observation, post-lesson discourse, student evidence) are most influential in prompting DI change? And what constraints persist even after multiple cycles?

Responding to these gaps, the present study investigates how vocational high school teachers’ differentiated instruction shifts across three lesson study cycles. By treating DI as a developmental practice and lesson study as an iterative learning system, this case study aims to contribute (1) a clearer description of DI change trajectories over time, (2) evidence on the lesson study processes that appear to enable or limit those changes, and (3) practical implications for designing sustained, collaborative professional development that is realistic for vocational school conditions. In doing so, the study also supports broader discussions on how to build professional learning models that are both pedagogically ambitious (advancing meaningful differentiation) and contextually feasible for teachers’ everyday work. In this study, differentiated instruction is examined through how teachers iteratively redesigned (a) grouping arrangements, (b) tiered group tasks aligned with readiness, and (c) teacher responsiveness to passive individuals during group work across three Plan–Do–See cycles.

LITERATURE REVIEW

Differentiated Instruction as an Inclusive Response to Classroom Heterogeneity

Differentiated instruction (DI) is widely positioned as an equity-oriented approach for addressing learner variability by adapting content, process, products, and learning conditions to students’ readiness, interests, and learning profiles. In secondary education where curricular demands and achievement gaps often widen DI is frequently framed as a pathway toward more inclusive learning opportunities, yet its enactment is far from straightforward. A systematic review of DI research in secondary education highlights both the promise of DI and the unevenness of the evidence base, noting substantial variation in operational definitions, measurement approaches, and implementation depth across studies (Smale-Jacobse et al., 2019).

A recurring issue in DI scholarship is the distinction between *intended* differentiation and *experienced* (or perceived) differentiation. Inclusive classrooms may adopt differentiation rhetorics, but students’ and teachers’ perceptions can diverge, and perceived personalization does not always map onto consistently

differentiated learning pathways. Research on perceived differentiation and personalization in inclusive settings underscores that DI must be understood not only as a set of strategies but also as a classroom experience shaped by interactional patterns, expectations, and feasibility constraints (Lindner et al., 2019).

Evidence of DI Outcomes in Secondary Education

Beyond conceptual claims, DI research has increasingly examined whether differentiation is associated with broader student outcomes especially those aligned with inclusion (e.g., belonging, social participation, academic self-concept). Longitudinal and large-scale work suggests DI can matter for students’ social-emotional and self-perception outcomes, but effects are often conditional on the quality and specificity of differentiation practices. For example, evidence on tiered assignments and differentiation in secondary classes indicates potential links to students’ well-being, social inclusion, and academic self-concept, while also emphasizing that DI implementation quality and duration are central to interpreting impact (Pozas et al., 2021).

However, the same evidence base also reinforces a persistent “implementation gap”: DI is advocated in policy and teacher education, yet teachers frequently report limited enactment or selective use of DI components. This gap motivates closer attention to what teachers actually *do* when they attempt to differentiate especially in settings where heterogeneity is pronounced and instructional time is constrained, such as vocational secondary education.

Teachers’ Capacity to Differentiate: Skills, Knowledge, and Motivational Drivers

A central strand of DI literature focuses on teacher-related determinants: practical knowledge, diagnostic capacity, decision-making under time pressure, and motivational dispositions. A cognitive task analysis of DI in secondary education argues that providing DI is a complex professional task requiring coordinated sub-skills (e.g., diagnosing learning needs, planning adaptive pathways, managing flexible grouping, monitoring progress, and adjusting instruction in real time). The study frames DI as a high-demand competence rather than a “pick-and-choose” strategy toolkit helping explain why superficial or episodic differentiation is common, particularly when teachers lack structured support for iterative refinement (Meutstege et al., 2023).

Motivation-related variables also matter. Work examining teachers’ interest and confidence suggests that even when teachers hold positive beliefs about DI, actual differentiation is influenced by teachers’ professional interest in DI and their sense of efficacy to enact it within real constraints (Pozas et al., 2022). In parallel, evidence from lower secondary contexts indicates that DI practice is shaped by multiple interlocking factors teacher beliefs, perceived feasibility, classroom composition, and organizational conditions rather than a single “teacher attitude” variable (Bi et al., 2023).

Policy environments further complicate DI enactment. In Luxembourg, for example, DI (together with competency-based approaches and formative assessment) has been mandatory within reform agendas, yet teachers' implementation varies substantially. Using the theory of planned behavior, one Frontiers study shows how attitudes, subjective norms, and perceived behavioral control relate to intentions and reported practices reinforcing that DI uptake is not only pedagogical but also social-organizational and policy-mediated (Dierendonck et al., 2024).

“Real Differentiation” Versus Surface-Level Adaptation

Across DI studies, a consistent implication is that “real” differentiation likely involves (a) deliberate design of multiple learning routes, (b) systematic use of evidence about student learning, and (c) iterative adjustment over time rather than one-off modifications (e.g., giving “extra tasks” to fast finishers). The perceived differentiation literature is especially useful here because it points to a measurement and design challenge: teachers may *intend* to differentiate, but students may not experience instruction as meaningfully responsive unless differentiation is visible, coherent, and sustained (Lindner et al., 2019).

DI outcome studies similarly imply that impacts depend on depth and continuity suggesting that teacher learning mechanisms must support repeated cycles of planning, enactment, observation, and refinement. This is where Lesson Study becomes theoretically relevant to DI not as a generic PD model, but as a structured improvement routine aligned with iterative instructional design.

Lesson Study as Job Embedded Professional Learning: From Cycles to Teacher Change

Lesson Study (LS) is frequently conceptualized as collaborative, practice-near professional learning organized around cycles of joint planning, research lesson enactment with observation, and post-lesson reflection (often locally framed as Plan–Do–See). LS is positioned as a mechanism for developing shared professional language, strengthening collective responsibility for student learning, and generating incremental improvements in instructional design through disciplined inquiry. Importantly for DI, LS can create repeated opportunities for teachers to focus on student responses and learning evidence conditions that DI literature identifies as critical but difficult to sustain in day-to-day teaching (Meutstege et al., 2023).

Recent LS research emphasizes that change is not only individual but also communal. A study tracing the development of teacher community through multiple successive LS cycles shows how collaboration can mature over time moving from tentative coordination toward deeper communal responsibility and productive engagement with differences in pedagogical viewpoints (Ní Shúilleabháin et al., 2024). This trajectory is particularly relevant to DI, because differentiation often requires negotiating shared norms about “fairness,” assessment evidence, grouping, and task design.

LS also adapts to varied contexts and constraints. During pandemic-era disruption, distance lesson study research documented shifting roles of teachers/observers and the reliance on video analysis to support observation and reflection routines (Capone et al., 2022). This matters methodologically for DI-focused LS studies, because capturing differentiation shifts across cycles may depend on robust observation artifacts (lesson plans, observation notes, student work samples, and reflection transcripts), whether collected in-person or digitally.

At the same time, LS research warns that methodological underreporting is common. A systematic review of transparency in LS research highlights that observation and reflection stages are often insufficiently described, limiting interpretability and transferability of LS findings (Kager et al., 2024). For DI-focused studies where “what changed” may be subtle (e.g., task tiering quality, grouping logic, scaffolding moves) transparent documentation is essential to credibly trace teacher shifts across cycles.

Vocational High School Context: Why DI Shifts Are Especially Salient

Vocational high schools typically combine academic learning with occupational competencies, often serving student populations with diverse readiness levels, motivations, and future pathways. This setting can intensify the DI challenge: teachers must balance standardized competency targets with authentic performance demands and heterogeneous learner profiles. At the same time, vocational education research highlights the importance of designing learning experiences that align instruction, materials, and assessment with authentic vocational goals an alignment that can either enable or constrain meaningful differentiation depending on school resources and curricular structures (Garay Abad, 2025).

Technology-rich design and innovation initiatives are also increasingly present in vocational education and training, creating additional differentiation opportunities (e.g., adaptive task sequences, multimodal supports, collaborative design tools) but also raising demands on teacher design expertise and collaborative routines (Hämäläinen, R., 2023).

Synthesis and Gap: Why Tracing DI Shifts Across Three LS Cycles Matters

Taken together, DI scholarship emphasizes (1) the complexity of DI as a professional task, (2) the importance of sustained, evidence-informed refinement, and (3) the gap between policy/intent and classroom enactment (Smale-Jacobse et al., 2019; Meutstege et al., 2023; Dierendonck et al., 2024). Meanwhile, LS research offers a structured improvement routine that can plausibly support DI development through iterative cycles and strengthened teacher community, while also highlighting the need for transparent, cycle-by-cycle documentation to make teacher change visible and researchable (Ní Shuilleabháin et al., 2024; Kager et al., 2024).

Yet, a clear empirical gap remains: comparatively few studies closely trace *how* teachers' differentiation moves evolve across multiple LS cycles especially in vocational high schools, where differentiation is both urgent and constrained. This gap motivates a cycle-based case study approach that follows teachers from Plan–Do–See routines toward “real differentiation,” operationalized through observable shifts in lesson design (e.g., tiering logic, grouping rationales), enactment (e.g., adaptive scaffolding moves), and evidence use in reflection (e.g., how student learning data is interpreted and translated into redesign decisions).

RESEARCH METHOD

This study employed a qualitative case study design situated within a lesson study framework to examine how teachers' differentiated instruction evolved across three Plan–Do–See cycles in a vocational high school context. The study focused on tracing instructional shifts over time rather than measuring instructional effectiveness. Differentiated instruction was operationalized through changes in grouping arrangements, tiered group tasks aligned with students' readiness, and teachers' responsiveness to passive individuals during group work.

The research was conducted during an open-class lesson study program using fantasy text learning as the instructional content. Participants included one model teacher who taught the research lesson and a group of observing teachers who collaboratively engaged in lesson planning and post-lesson reflection. Students in the observed class participated in group-based learning activities, and their interactions served as the primary source of evidence for instructional redesign decisions.

The lesson study process consisted of three complete Plan–Do–See cycles. In the Plan stage, teachers collaboratively designed the research lesson, including decisions related to grouping and task design. In the Do stage, the lesson was implemented as an open class while other teachers observed student participation and interaction patterns. In the See stage, the team conducted structured reflection sessions to analyze classroom evidence and identify areas for redesign, which informed subsequent cycles.

Data collection was carried out across all stages of the lesson study cycles. Data sources included lesson plans and revised instructional materials, observation notes documenting student participation during group work, and records of post-lesson reflection discussions. Supporting data, such as samples of student group work, were used when available to enrich interpretation of instructional changes.

Data analysis followed a longitudinal qualitative approach. First, data from each cycle were analyzed to describe how differentiated instruction was planned and enacted. Second, cross-cycle analysis was conducted to identify patterns of change in grouping strategies, task differentiation, and teacher responsiveness. To enhance trustworthiness, data triangulation across planning documents, observations, and reflection records was applied, and findings were reported as context-specific insights rather than generalized claims.

FINDINGS AND DISCUSSION

Overview of the Shifts Across Three Lesson Study Cycles

Across three Plan–Do–See lesson study cycles implemented through an open class on fantasy text instruction, the teacher team progressively moved from a general collaborative arrangement to more intentional, evidence-informed differentiated instruction. The core trajectory can be summarized as follows:

1. Cycle I revealed a participation imbalance in heterogeneous groups, where higher-ability students dominated discussion and presentation while lower-ability students remained largely silent.
2. Cycle II responded to this issue by redesigning the lesson with homogeneous grouping and introducing tiered group tasks aligned with each group’s ability level, which increased participation among students who had previously been passive especially in lower-ability groups.
3. Cycle III maintained homogeneous grouping and tiered tasks, while strengthening differentiation by shifting teachers’ attention from group-level design alone to individual-level responsiveness, deliberately supporting students who appeared passive in any group (high-, mid-, or low-ability).

This longitudinal pattern shows how iterative reflection in lesson study can shift teaching from “one-size collaboration” toward what can be termed real differentiation for example differentiation that is visible not only in lesson plans but also in how participation and support are managed during learning activities.

Finding 1: Heterogeneous Grouping Did Not Guarantee Equitable Participation (Cycle I)

In Cycle I, the research lesson was designed and implemented during an open class, with students arranged in heterogeneous groups. The underlying intention was to facilitate peer learning and collaborative engagement. However, post-lesson reflection identified a clear challenge: during group discussion and presentation, high-ability students tended to dominate, while lower-ability students remained silent and contributed minimally.

This finding suggests that heterogeneity, by itself, does not automatically produce inclusive collaboration. Without additional structures (e.g., role distribution, accountability routines, or targeted scaffolds), heterogeneous grouping can reproduce existing classroom hierarchies, allowing confident or higher-performing students to take control of talk, decision-making, and public performance. In this case, the lesson study reflection served as a diagnostic lens that made the participation gap visible and actionable.

Importantly, the Cycle I reflection treated “silence” not merely as a student trait but as an instructional design problem something that could be addressed through redesign. This reframing is a hallmark of lesson study as an improvement-

oriented professional learning process: teachers interpret classroom events as evidence for revising instructional conditions, rather than as fixed learner deficits.

Finding 2: Redesigning Grouping to Homogeneous Groups Supported Participation Among Previously Passive Learners (Cycle II)

Based on the Cycle I reflection, the lesson plan was redesigned for Cycle II. The teacher team changed the grouping strategy from heterogeneous to homogeneous grouping, with the explicit aim of reducing domination by high-ability students and creating a space where students with similar readiness levels could contribute more confidently.

The Cycle II reflection indicated a meaningful improvement: students who had been passive in Cycle I became more active during discussion, particularly in the lower-ability groups. This suggests that homogeneous grouping reduced the perceived risk of participation for lower-ability students, enabling more balanced interaction.

The shift from heterogeneous to homogeneous grouping represents a deliberate differentiation move at the learning environment level. Rather than assuming mixed-ability grouping is inherently beneficial, the teachers adapted the learning conditions to support equitable voice. In vocational high school contexts where learner readiness can vary widely this adjustment can be especially important, because classroom participation often shapes access to literacy practices (e.g., interpreting texts, articulating ideas, and negotiating meaning).

At the same time, the Cycle II outcomes also indicate that participation equity is not solely about grouping structure; grouping works best when it is paired with task design that matches learners' current capabilities. This is precisely what the team implemented next through tiered tasks.

Finding 3: Tiered Group Tasks Enabled More Meaningful Engagement by Matching Task Difficulty to Group Readiness (Cycle II)

In Cycle II, differentiated instruction was enacted through tiered group assignments, where task difficulty was aligned with each group's ability level. Higher-ability groups received more challenging tasks, while mid- and lower-ability groups received tasks designed to be more accessible and attainable given their readiness.

Reflection data highlighted that this task differentiation contributed to increased engagement, especially among learners who had previously remained silent. Lower-ability students became more active in discussion when tasks were calibrated to their level and thus more achievable.

This finding illustrates a shift from "differentiation as extra work" to differentiation as purposeful design of learning pathways. Tiered tasks functioned as a practical mechanism for lowering unnecessary barriers (e.g., cognitive overload or linguistic demands) while maintaining meaningful learning goals for all groups. When tasks are aligned with readiness, students are more likely to enter the activity,

sustain effort, and contribute verbally particularly in discussion-based literacy learning such as fantasy text interpretation.

For vocational high schools, tiered tasks also help reconcile a common tension: maintaining shared curricular objectives while acknowledging that students may need different levels of support and challenge to reach those objectives. The Cycle II redesign demonstrates that differentiation can be implemented without fragmenting the class into entirely different lessons; instead, it can be built into a shared lesson structure through calibrated task demands.

Finding 4: “Real Differentiation” Emerged When Teachers Shifted Focus from Group-Level Design to Individual-Level Responsiveness (Cycle III)

In Cycle III, the teachers retained the design elements that had proven productive: homogeneous grouping and tiered group assignments. The key development in this cycle was a shift in teacher attention during implementation: the teacher deliberately focused on individual students who appeared passive, not only within the lower-ability groups but also within mid- and high-ability groups.

This indicates that passive participation was recognized as an issue that can occur across ability levels (e.g., quiet high-ability students, disengaged mid-ability students, or low-ability students lacking confidence). Teachers responded by directing more targeted support, prompts, and attention toward those individuals during group work.

Cycle III marks the strongest evidence of movement toward “real differentiation.” While Cycle II introduced differentiation primarily at the group level (through homogeneous grouping and tiered tasks), Cycle III extended differentiation to the individual level through teacher responsiveness. This matters because group-level differentiation can still leave some students invisible: even in homogeneous groups, some individuals may withdraw, defer to peers, or disengage.

By attending deliberately to passive individuals in every group, the teacher enacted a more nuanced view of learner diversity, one that recognizes variability within groups, not only between groups. This aligns with contemporary understandings of differentiated instruction as not merely planned variation in tasks, but also adaptive teaching moves during learning activities. In lesson study terms, the Plan–Do–See cycle did not stop at improving the lesson plan; it also refined the teacher’s real-time noticing and responsiveness, which is essential for sustained DI practice.

Cross-Cycle Interpretation: From Plan–Do–See to Real Differentiation

Taken together, the three cycles show a coherent developmental pathway: **Cycle I** surfaced a participation problem under heterogeneous grouping (domination vs silence). **Cycle II** improved equity through redesigned grouping and tiered tasks aligned with readiness, leading to greater participation among previously silent learners. **Cycle III** strengthened differentiation further by targeting passive individuals across all ability groups, demonstrating that differentiation evolved from structural adjustments to more responsive pedagogy.

This pattern highlights lesson study's role as a professional learning mechanism that supports differentiation through iterative evidence-based redesign. Instead of treating differentiation as a fixed set of strategies, the cycles show how teachers can progressively refine the conditions for participation (grouping), the accessibility and challenge level of tasks (tiered assignments), and the teacher's adaptive support (attention to passive individuals), thereby moving from surface-level change to more meaningful differentiation in practice.

Practical Implications for Vocational High Schools

In vocational high schools, teachers should not assume that heterogeneous grouping automatically promotes inclusion; instead, grouping patterns need to be examined through systematic observation and post-lesson reflection to determine whether participation is actually distributed equitably. Grouping decisions should also be integrated with tiered tasks, because homogeneous grouping tends to work more effectively when task difficulty is calibrated to each group's readiness, enabling students to access learning at an appropriate challenge level. In addition, teachers need to monitor passivity at the individual level, since quiet or disengaged participation can occur in high-, mid-, and low-ability groups; therefore, teachers should plan and enact specific strategies to notice passive students and provide timely prompts or support. Finally, the "See" stage in lesson study should be treated as a redesign engine, where reflection is anchored in concrete classroom evidence, such as who participated, how tasks functioned for different groups, and what specific redesign actions can strengthen access, engagement, and meaningful participation in subsequent cycles.

CONCLUSION

This case study traced teachers' shifts in differentiated instruction (DI) across three Lesson Study (Plan-Do-See) cycles implemented through an open class on fantasy text learning in a vocational high school context. The findings show a clear developmental pathway from an initial design that did not ensure equitable participation to increasingly intentional and responsive differentiation grounded in evidence from post-lesson reflection.

In Cycle I, heterogeneous grouping intended to promote peer support resulted in unequal participation, with higher-ability students dominating discussion and presentation while lower-ability students remained largely silent. The Lesson Study reflection stage functioned as a diagnostic space where this participation gap was recognized as an instructional design problem rather than a fixed learner deficit. In response,

Cycle II redesigned the lesson by shifting to homogeneous grouping and implementing tiered group tasks aligned with each group's readiness. This redesign was associated with improved engagement, as students who had been passive in Cycle I became more active, particularly within lower-ability groups.

In Cycle III, the team sustained homogeneous grouping and tiered tasks while strengthening differentiation at the individual level, as the teacher deliberately attended to passive students across all groups (high-, mid-, and low-ability). This final shift indicates movement from group-level differentiation alone toward "real

differentiation,” where instruction is not only planned but also enacted responsively in the moment.

ACKNOWLEDGMENTS

The authors would like to express their sincere gratitude to the teacher and students of vocational high school 1 Palopo who participated in the lesson study activities and generously shared their time, experiences, and reflections throughout the research process. Special appreciation is extended to the lesson study team and colleagues from Cokroaminoto University of Palopo for their academic support, collegial collaboration, and constructive input during the planning, observation, and reflective stages of the study. The authors also thank the school leadership for facilitating the open-class implementation and supporting collaborative inquiry. Finally, the authors acknowledge the contribution of prior scholarship in differentiated instruction and lesson study, which informed the conceptual framework and interpretation of the findings.

REFERENCES

- Bi, M., Struyven, K., & Zhu, C. (2023). Variables that influence teachers’ practice of differentiated instruction in Chinese classrooms: A study from teachers’ perspectives. *Frontiers in Psychology*, 14, 1124259. <https://doi.org/10.3389/fpsyg.2023.1124259>
- Capone, R., Adesso, M. G., & Fiore, O. (2022). Distance lesson study in mathematics: A case study of an Italian high school. *Frontiers in Education*, 7, 788418. <https://doi.org/10.3389/educ.2022.788418>
- Capone, R., Adesso, M. G., & Fiore, O. (2023). Distance lesson study and video-based reflection: Opportunities and challenges for collaborative teacher learning. *Frontiers in Education*, 8, 1130456. <https://doi.org/10.3389/educ.2023.1130456>
- Dierendonck, C., Poncelet, D., & Tinnes-Vigne, M. (2024). Why teachers do (or do not) implement recommended teaching practices? An application of the theory of planned behavior. *Frontiers in Psychology*, 15, 1269954. <https://doi.org/10.3389/fpsyg.2024.1269954>
- Garay Abad, L. (2025). The impact of teaching materials on instructional design and teacher professional development across career stages. *Frontiers in Education*. doi:10.3389/educ.2025.1577721.
- Hämäläinen, R., De Wever, B., Malin, A., & Cincinnato, S. (2023). Teacher competences for digital and technology-enhanced learning in vocational education and training: A systematic review. *Frontiers in Education*, 8, 1143702. <https://doi.org/10.3389/educ.2023.1143702>
- Kager, K., Kalinowski, E., Jurczok, A., & Vock, M. (2024). A systematic review of transparency in Lesson Study research: How do we report on the observation

- and reflection stages? *Frontiers in Education*, 9, 1322624. <https://doi.org/10.3389/educ.2024.1322624>
- Langelan, B. N., Gaikhorst, L., Smets, W., & Oostdam, R. J. (2024). Differentiating instruction: Understanding the key elements for successful teacher preparation and professional development. *Teaching and Teacher Education*, 140, 104464. <https://doi.org/10.1016/j.tate.2023.104464>
- Lindner, K.-T., Alnahdi, G. H., Wahl, S., Schwab, S., & Koller, H. (2019). Perceived differentiation and personalization teaching approaches in inclusive classrooms: Perspectives of students and teachers. *Frontiers in Education*, 4, 58. <https://doi.org/10.3389/educ.2019.00058>
- Meutstege, K., Vrieling, M., van Geel, M., & Visscher, A. J. (2023). A cognitive task analysis of the teacher skills and knowledge required for differentiated instruction in secondary education. *Frontiers in Education*, 8, 1171554. <https://doi.org/10.3389/educ.2023.1171554>
- Ní Shúilleabháin, A., Owens, E., Seery, A., & Hyland, D. (2024). From beginning to mature: Investigating the development of teacher community through Lesson Study. *Frontiers in Education*, 9, 1331127. <https://doi.org/10.3389/educ.2024.1331127>
- Pozas, M., Letzel, V., Lindner, K.-T., & Schwab, S. (2021). DI (Differentiated Instruction) does matter! The effects of DI on secondary school students' well-being, social inclusion and academic self-concept. *Frontiers in Education*, 6, 729027. <https://doi.org/10.3389/educ.2021.729027>
- Pozas, M., Letzel-Alt, V., & Schwab, S. (2023). The effects of differentiated instruction on teachers' stress and job satisfaction. *Teaching and Teacher Education*, 122, 103962. <https://doi.org/10.1016/j.tate.2022.103962>
- R Upa, H Patang, P Paldy, I Inrawati. 2024. Interactive Multimedia in Differentiated Learning to Improve identifying of Simple Past Tense sentences in Vocational High School Students. *Jurnal Studi Guru dan Pembelajaran* 7 (2), 950-959.
- R Upa, H. Patang, Rosmiati R. 2024. Peningkatan kompetensi guru dalam penerapan pembelajaran diferensiasi berbasis digital melalui kegiatan lesson study. *To Maega: Jurnal Pengabdian Masyarakat*. 2024;7(3):624-633. <https://shorturl.at/A8L5L>
- R Upa, S Damayanti, H Patang. 2024. Implementation of lesson study as a strategy to optimize differentiated instruction in English language teaching. *IDEAS: Journal on English Language Teaching & Learning, Linguistics & Literature*. 12(2). Available from: <https://shorturl.at/hII0M>
- R Upa, Damayanti S, Patang H. Implementation of lesson study as a strategy to optimize differentiated instruction in English language teaching. *IDEAS: Journal on English Language Teaching & Learning, Linguistics & Literature*. 2024;12(2). Available from: <https://shorturl.at/hII0M>

Smale-Jacobse, A. E., Meijer, A., Helms-Lorenz, M., & Maulana, R. (2019). Differentiated instruction in secondary education: A systematic review of research evidence. *Frontiers in Psychology*, 10, 2366. <https://doi.org/10.3389/fpsyg.2019.02366>

Suardi S, R Upa, Pulu R. 2021. Revitalisasi kapasitas guru bahasa Inggris dalam aktivitas pembelajaran reflektif berbasis transcript-based lesson analysis (TBLA) dalam perencanaan pembelajaran (planning). *Jurnal Abdimas Indonesia*. 1(1):62-69. <https://shorturl.at/MnfVE>