

Transformative Authentic Assessment for Learner Identity Reconstruction in Personalized Learning Pathways: Advancing SDG 4 and SDG 10 in Indonesian Education

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ABSTRACT

Objective: To investigate how transformative authentic assessment implemented within Personalized Learning Pathways (PLP) reconstructs learner identity by enhancing motivation and self-efficacy among learners in Indonesian Community Learning Centers (PKBM), while supporting the achievement of Sustainable Development Goals (SDGs) 4 and 10. **Method:** A qualitative multi-site case study was conducted at PKBM Sekolah Dolan Malang and PKBM Tsurayya Karimah Indonesia. Fifty-seven participants, including institutional heads, tutors, administrative staff, learners, and an external supervisor, were purposively selected. Data were collected through participatory observations, semi-structured interviews, and document analysis. The data were analyzed using thematic analysis and cross-site synthesis to identify recurring patterns across both learning centers. **Results:** The findings reveal that authentic assessment functions as a continuous, reflective, and learner-centered process rather than merely an instrument for measuring academic achievement. Portfolio-based assessment, reflective discussions, individualized feedback, and continuous learning monitoring significantly enhanced learners' intrinsic motivation and self-efficacy. These assessment practices gradually transformed learners' perceptions from educational failure and low self-confidence toward positive learner identities characterized by confidence, autonomy, responsibility, and lifelong learning orientation. **Novelty:** Proposing a transformative authentic assessment framework that conceptualizes learner identity reconstruction as a sequential psychological process linking authentic assessment, recognition of learners' strengths, enhanced motivation, strengthened self-efficacy, and positive learner identity. The findings extend authentic assessment literature beyond academic achievement by demonstrating its role as a psychological mechanism for educational inclusion and learner empowerment within personalized learning pathways in community education.

INTRODUCTION

Achieving Sustainable Development Goal (SDG) 4 requires education systems to provide inclusive, equitable, and quality learning opportunities that enable every learner to develop not only academic competence but also confidence, autonomy, and a positive learning identity. For marginalized learners, particularly those who have experienced educational disruption, assessment should function as more than a mechanism for measuring achievement. Instead, assessment should become a transformative educational process that recognizes learners' strengths, validates their lived experiences, and supports the reconstruction of their learning identity. Within personalized learning pathways (PLP), authentic assessment is expected to facilitate this transformation by aligning learning experiences with learners' individual needs, interests, readiness, and potential while simultaneously reducing educational inequalities in line with SDG 10.

Despite this expectation, educational realities remain far from ideal. In Indonesia, approximately 21.61% of adolescents aged 16–18 remain outside the formal education system due to school dropout, early employment, economic hardship, and psychosocial challenges

(BPS, 2023; KPAI, 2024). Community Learning Centers (Pusat Kegiatan Belajar Masyarakat – PKBM) serve as an essential alternative pathway for these learners by providing flexible and inclusive educational opportunities. However, many learners entering PKBM carry negative educational experiences characterized by repeated academic failure, low self-confidence, diminished motivation, and the perception that they are incapable of succeeding in learning. Such experiences frequently shape a negative learner identity that continues to influence their engagement even after re-entering education.

This condition reveals a significant gap between the educational ideals promoted by SDG 4 and the realities experienced by marginalized learners. While assessment is expected to empower learners and promote personal growth, conventional assessment practices continue to emphasize standardized performance, deficit identification, and summative evaluation. Rather than recognizing learners' strengths and developmental progress, these approaches often reinforce feelings of inadequacy and failure, particularly among learners with disrupted educational backgrounds. Consequently, assessment becomes a source of psychological pressure instead of a catalyst for rebuilding confidence, strengthening self-efficacy, and fostering positive learner identities.

Previous studies have consistently demonstrated the educational value of authentic assessment. Research suggests that authentic assessment enhances learner engagement, intrinsic motivation, collaborative learning, and meaningful learning experiences by connecting assessment with real-life contexts (Gulikers et al., 2004; Swaffield & Dudley, 2020). Other studies further indicate that constructive feedback, portfolio assessment, and mastery-oriented evaluation contribute positively to learners' self-efficacy and self-regulated learning (Bandura, 1997; Schunk & DiBenedetto, 2016). Personalized learning approaches have also been found to improve learner autonomy by accommodating individual readiness, interests, and learning preferences (Walkington & Bernacki, 2019). Nevertheless, existing studies predominantly focus on academic achievement, engagement, or instructional effectiveness within formal school settings. Limited attention has been devoted to understanding how authentic assessment functions as a transformative mechanism for reconstructing learner identity among marginalized learners in nonformal education contexts such as PKBM. Consequently, the psychological processes through which authentic assessment reshapes motivation, self-efficacy, and learner identity remain insufficiently explored.

Addressing this gap, the present study positions transformative authentic assessment as a psychological and pedagogical mechanism embedded within Personalized Learning Pathways. Rather than viewing assessment merely as an evaluative instrument, this study conceptualizes authentic assessment as a continuous process through which learners recognize their strengths, experience mastery, receive personalized feedback, and gradually reconstruct more positive perceptions of themselves as capable learners. By examining learners' experiences in Indonesian PKBM, this study explains how authentic assessment supports educational re-engagement among learners who have previously experienced educational exclusion.

Accordingly, this study aims to investigate how transformative authentic assessment embedded within Personalized Learning Pathways reconstructs learner identity through the development of motivation and self-efficacy among learners in Indonesian Community Learning Centers (PKBM), while contributing to the achievement of SDG 4 (Quality Education) and SDG 10 (Reduced Inequalities).

The novelty of this study lies in three important contributions. First, it reconceptualizes authentic assessment from a conventional evaluation tool into a transformative mechanism for learner identity reconstruction. Second, it extends the discussion of authentic assessment from formal schooling to Indonesian nonformal education, a context that remains underrepresented in international literature despite serving highly heterogeneous and educationally marginalized learners. Third, by integrating Personalized Learning Pathways, authentic assessment, Self-Determination Theory, self-efficacy theory, and learner identity into a single analytical framework, this study offers a comprehensive perspective on how assessment can promote both psychological empowerment and educational inclusion, thereby supporting the broader objectives of SDG 4 and SDG 10.

METHODOLOGY

Research design

This study employed a qualitative approach using a multi-site case study design to explore how transformative authentic assessment embedded in Personalized Learning Pathways (PLP) reconstructs learner identity in Indonesian Community Learning Centers (Pusat Kegiatan Belajar Masyarakat – PKBM). A multi-site design was selected to enable cross-case comparisons between two PKBMs with different organizational characteristics while identifying common patterns of authentic assessment practices in natural educational settings. This design is appropriate for examining complex psychological and educational processes within their real-life contexts (Yin, 2018).

Research sites and participants

The research was conducted at PKBM Sekolah Dolan Malang and PKBM Tsurayya Karimah Indonesia, two community learning centers recognized for implementing Personalized Learning Pathways in nonformal education. Participants were selected through purposive sampling based on their direct involvement in planning, implementing, and experiencing authentic assessment practices. The study involved 57 participants consisting of institutional heads, tutors, administrative staff, learners, and an external supervisor.

Table 1. Characteristics of participants

Participants	Number	Role
Institutional Heads	2	Institutional leadership
Tutors	20	Learning facilitators
Administrative Staff	4	Learning administration
Learners	30	Primary participants
Supervisor	1	External academic supervision
Total	57	

Data collection

Data were collected over a ten-month period through participatory observation, semi-structured interviews, and document analysis. Participatory observations focused on portfolio assessment, project-based learning activities, reflective sessions, and feedback interactions. Semi-structured interviews were conducted with institutional heads, tutors, staff, and learners to explore their experiences and perceptions of authentic assessment. Documentary evidence, including learner portfolios, learning contracts, and progress

records, was examined to strengthen data triangulation and provide contextual understanding of assessment practices.

Data analysis

The collected data were analyzed using thematic analysis following Braun and Clarke's (2006) iterative procedures of data familiarization, coding, theme generation, theme review, and interpretation. Cross-site analysis was subsequently conducted to compare findings from both PKBMs and identify recurring patterns, similarities, and contextual differences in the implementation of transformative authentic assessment.

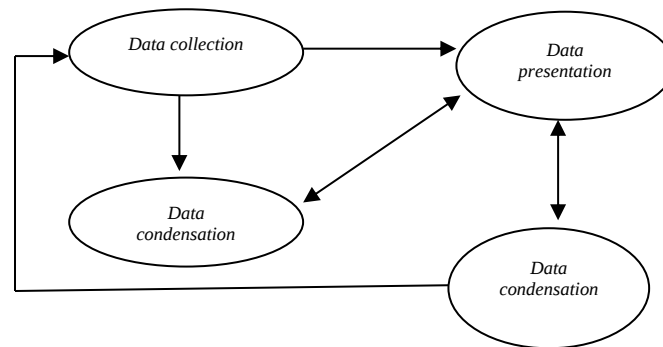


Figure 1. Data analysis procedure

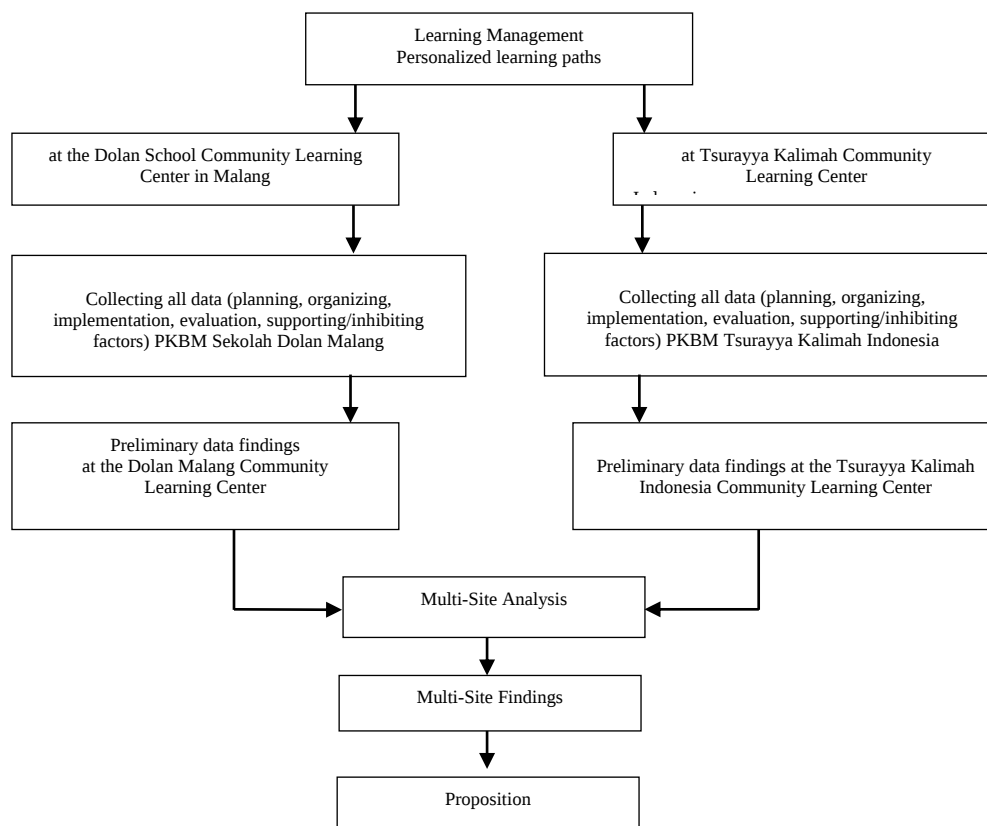


Figure 2. Cross-site analysis process

Trustworthiness

To ensure the trustworthiness of the findings, this study employed data triangulation through multiple sources and collection methods, member checking with selected participants, and peer debriefing throughout the analysis process. An audit trail documenting coding decisions and theme development was also maintained to enhance the credibility, dependability, and confirmability of the research findings.

RESULTS AND DISCUSSION

Results

Authentic assessment as a meaningful learning experience that strengthens learners' motivation

Findings from observations, interviews, and document analysis revealed that authentic assessment transformed learners' perceptions of assessment from a stressful evaluative activity into a meaningful learning experience. Unlike conventional examinations that primarily measured academic achievement, assessment activities in both PKBMs emphasized portfolio development, project completion, reflective journals, presentations, and other authentic learning tasks closely related to learners' real-life experiences. These assessment practices enabled learners to demonstrate their competencies through diverse forms of performance rather than standardized tests, thereby increasing their engagement and willingness to participate in learning activities.

Tabel 2. Research findings regarding the evaluation of personalized learning paths at PKBM Dolan School, Malang

Theme	Key Findings	Contribution to Learner Identity Reconstruction
Continuous and Reflective Assessment	Assessment was conducted continuously throughout the learning process rather than only at the end of instruction. Tutors regularly reviewed learners' progress and adjusted personalized learning pathways based on emerging needs.	Encouraged learners to perceive assessment as a developmental process rather than a judgment of academic ability.
Learning Process Monitoring	Tutors continuously observed learners' academic participation, behavioral engagement, and responses to learning activities to monitor both academic and non-academic development.	Increased learners' motivation through continuous guidance and personalized support.
Collaborative Reflection	Learners actively participated in reflective discussions to evaluate their learning experiences, identify challenges, and provide feedback for improving subsequent learning activities.	Promoted learner autonomy, self-awareness, and responsibility for personal learning.
Portfolio-Based Assessment	Portfolios documented learners' projects, assignments, and learning achievements over time, emphasizing progress instead of final examination scores.	Strengthened learners' self-efficacy by making individual growth visible and measurable.
Collaborative Evaluation among Educators	Tutors regularly discussed learners' development and jointly reviewed the effectiveness of personalized learning	Ensured consistent support and strengthened learners' confidence through

Theme	Key Findings	Contribution to Learner Identity Reconstruction
Institutional Management of Assessment Results	pathways to determine appropriate instructional adjustments. Assessment records, portfolios, and learning progress reports were systematically documented and utilized for continuous program improvement and future instructional planning.	coordinated educational practices. Sustained learner development by integrating assessment evidence into continuous personalized learning cycles.

Interview data further indicated that learners experienced renewed motivation because assessment was perceived as a process of documenting learning progress rather than identifying deficiencies. Several participants explained that they felt more enthusiastic to complete learning tasks since every achievement, regardless of its scale, was acknowledged by tutors through constructive feedback and continuous encouragement. As one learner explained:

“Teachers here always accompany us, especially when learning takes place outside the classroom. During activities such as the Super Camp, they ensure that everything runs safely and smoothly. Whenever I encounter difficulties, they explain concepts through real-life examples. As a result, teachers are not only instructors in the classroom but also learning companions who guide us throughout the learning process.”
(ARP, Learner, I/W/S/F3/05-08-2025/5/I)

These findings suggest that authentic assessment created meaningful learning experiences that strengthened intrinsic motivation by allowing learners to experience success through personalized and contextual learning activities. Across both research sites, motivation emerged not merely from obtaining assessment results but from learners' recognition that their individual progress and efforts were valued throughout the learning process.

Recognition of learners' strengths enhances self-efficacy

The second major finding demonstrates that authentic assessment contributed to the development of learners' self-efficacy by emphasizing individual strengths rather than academic deficiencies. Classroom observations showed that tutors consistently provided personalized feedback, encouraged portfolio revision, and highlighted learners' progress instead of comparing their performance with others. This strength-based assessment approach gradually fostered learners' confidence in completing increasingly challenging learning tasks.

Interview findings also revealed that learners began to perceive themselves as capable individuals after receiving continuous recognition of their learning achievements. Portfolio documentation enabled learners to observe their own progress over time, reinforcing their belief that learning success could be achieved through sustained effort and guidance. One participant expressed this experience as follows:

“Interaction among learners takes place through group work, discussions, and collaborative activities. For example, learning is integrated with nature and outdoor

classes, which encourage creativity, strengthen togetherness, and foster mutual respect among learners.”

(IMA, Learner, I/W/S/F3/05-08-2025/8/I)

Cross-site analysis confirmed similar patterns in both PKBMs, indicating that authentic assessment promoted mastery experiences, constructive feedback, and opportunities for self-reflection, all of which strengthened learners' beliefs in their own capabilities. Consequently, self-efficacy developed not only through successful task completion but also through continuous recognition of learners' individual growth.

Learner identity reconstruction through transformative authentic assessment

The most significant finding of this study concerns the reconstruction of learner identity through transformative authentic assessment. Data from observations and interviews showed that many learners entered PKBM carrying negative educational identities shaped by previous experiences of school failure, dropout, or prolonged educational exclusion. However, authentic assessment gradually shifted these perceptions by enabling learners to recognize their strengths, document their learning achievements, and experience meaningful academic success within supportive learning environments.

Interview data demonstrated that learners increasingly perceived themselves not as individuals who had failed in education but as capable learners with opportunities for continued personal and academic development. Tutors also observed noticeable changes in learners' confidence, classroom participation, and willingness to take responsibility for their own learning. As reflected by one participant:

Cross-site findings demonstrated that learners gradually shifted from passive recipients of instruction to active participants who confidently engaged in collaborative projects, reflected on their own learning progress, and assumed greater responsibility for their learning. These patterns indicate that authentic assessment contributed not only to academic development but also to the reconstruction of learners' identities as capable, autonomous, and lifelong learners.

Cross-site analysis demonstrated a consistent transformational pattern across both PKBMs. Authentic assessment functioned not merely as an evaluation strategy but as a psychological and pedagogical mechanism that facilitated learners' transition from deficit-based self-perceptions toward positive learner identities. Rather than emphasizing previous academic failure, assessment practices encouraged learners to redefine themselves through continuous achievement, reflection, and personal growth.

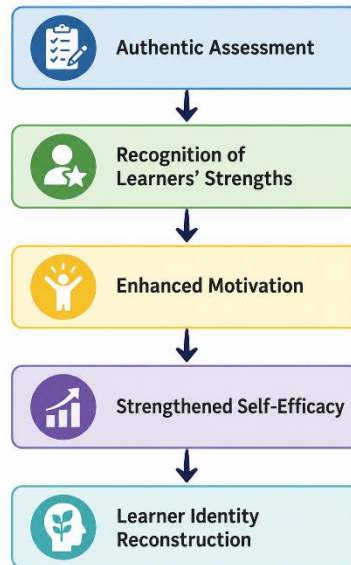


Figure 3. Transformative process of learner identity reconstruction

The figure illustrates the conceptual pattern emerging from the cross-site analysis, showing that learner identity reconstruction did not occur as an isolated outcome but developed through a sequential process beginning with authentic assessment practices, followed by recognition of learners' strengths, increased motivation, and strengthened self-efficacy. This transformation represents the central finding of the present study and demonstrates the role of authentic assessment as a mechanism for promoting psychological empowerment and educational re-engagement among marginalized learners.

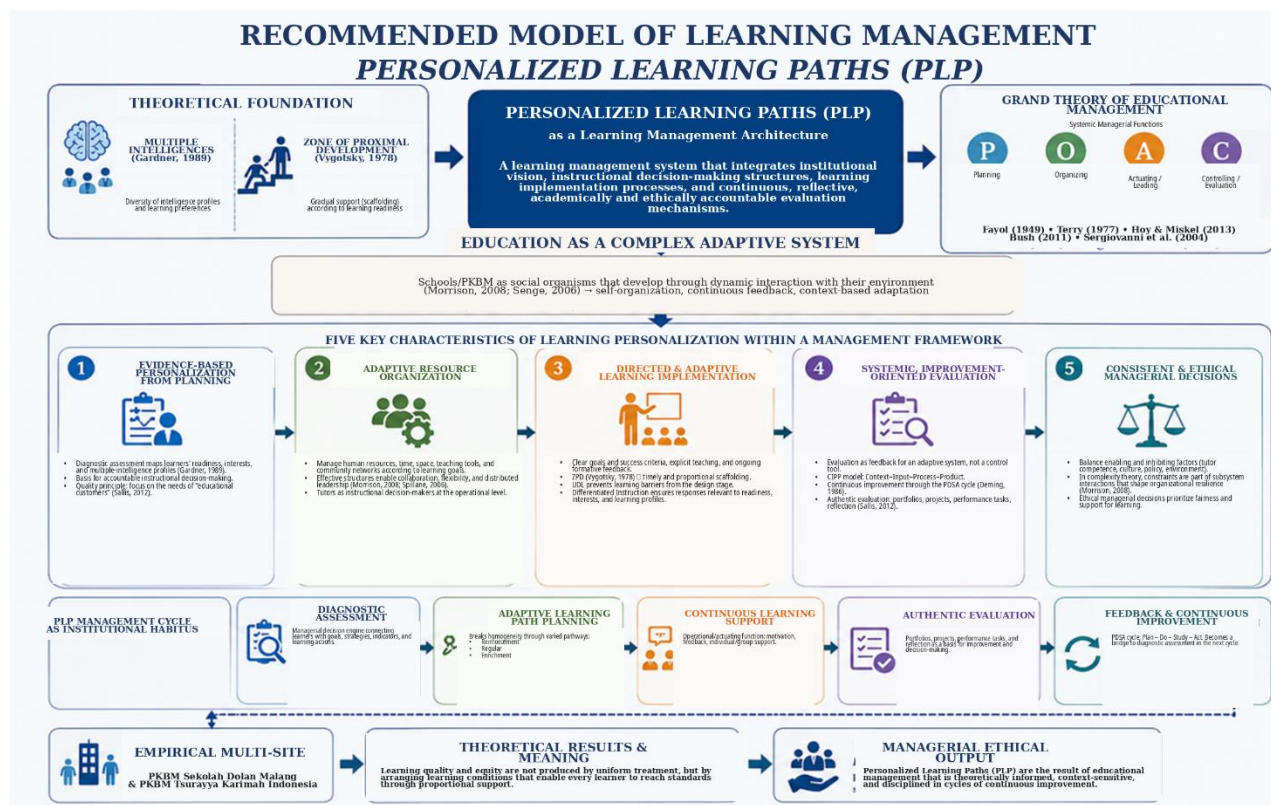


Figure 4. Recommendation model

Discussion

The findings demonstrate that transformative authentic assessment embedded within Personalized Learning Pathways (PLP) extends beyond its conventional role as a mechanism for measuring academic achievement. Instead, assessment emerged as a continuous, reflective, and learner-centered process that promoted learners' motivation, strengthened their self-efficacy, and gradually reconstructed their learning identities. Across both PKBM Sekolah Dolan Malang and PKBM Tsurayya Karimah Indonesia, assessment was integrated into everyday learning activities through portfolios, authentic projects, reflective discussions, individualized feedback, and continuous observation rather than relying solely on summative examinations. Such findings reinforce the argument that authentic assessment should function as an integral component of learning itself rather than as a separate evaluative event (Black & Wiliam, 1998; Herrington et al., 2014). Within Personalized Learning Pathways, assessment became a dynamic process that continuously informed instructional adjustments while simultaneously acknowledging learners' progress, thereby creating psychologically safe learning environments for individuals who had previously experienced educational exclusion. These findings are also consistent with the principles of personalized learning proposed by Bray and McClaskey (2015) and Basham et al. (2016), who argue that assessment should adapt to learners' readiness, interests, and individual learning trajectories rather than applying uniform standards to heterogeneous learners.

The positive influence of authentic assessment on learners' motivation can be interpreted through the lens of Self-Determination Theory (Ryan & Deci, 2017), which emphasizes autonomy, competence, and relatedness as the three fundamental psychological needs underlying intrinsic motivation. The findings indicate that authentic assessment satisfied these psychological needs by allowing learners to demonstrate competence through meaningful learning tasks, providing opportunities to exercise autonomy in completing projects and portfolios, and strengthening interpersonal relationships through continuous dialogue with tutors. Unlike conventional examinations that frequently position learners as passive recipients of evaluation, authentic assessment encouraged learners to become active participants who continuously reflected upon and monitored their own learning progress. These findings support previous studies highlighting that authentic learning environments increase learner engagement because assessment activities are directly connected to real-life experiences and meaningful contexts (Brown et al., 1989; Herrington et al., 2014; Moon, 2019). Furthermore, the present findings extend previous research by demonstrating that such motivational benefits are equally applicable within Indonesian community education settings, where learners frequently possess diverse educational backgrounds, interrupted schooling experiences, and varying levels of academic readiness. Consequently, authentic assessment functions not only as a pedagogical innovation but also as a psychological intervention that restores learners' willingness to participate actively in educational processes.

Another significant contribution of this study lies in explaining how authentic assessment strengthens learners' self-efficacy through continuous recognition of individual progress. Bandura (1986, 1997) argues that mastery experiences represent the strongest source of self-efficacy because successful performance gradually reshapes individuals' beliefs about their own capabilities. The implementation of portfolio-based assessment, reflective evaluation, and individualized tutor feedback in both PKBMs provided repeated mastery experiences by documenting learners' incremental achievements rather than emphasizing isolated

examination scores. Learners therefore became increasingly aware of their own development, enabling them to reinterpret previous educational failures as temporary challenges rather than permanent indicators of inability. This finding is consistent with Nicol and Macfarlane-Dick (2006), who argue that formative feedback supports self-regulated learning by helping learners recognize progress and identify strategies for further improvement, as well as Hattie and Timperley (2007), who emphasize that effective feedback promotes confidence when it focuses on learning processes rather than merely evaluating outcomes. Similarly, portfolio-based assessment has been recognized as an effective strategy for documenting learning growth and encouraging learner reflection over time (Moon, 2004; Henderson & Phillips, 2015). However, this study extends previous scholarship by demonstrating that, within community education contexts serving marginalized learners, authentic assessment performs a broader psychological function. Rather than simply measuring competencies, it progressively transforms learners' self-perceptions by validating their strengths, acknowledging continuous improvement, and creating opportunities for successful learning experiences that enhance confidence to engage in subsequent learning challenges. These findings suggest that authentic assessment contributes not only to improved academic performance but also to the development of positive psychological resources that sustain lifelong learning.

The most important contribution of this study is the identification of authentic assessment as a transformative mechanism for learner identity reconstruction within Personalized Learning Pathways. While previous studies have consistently demonstrated that authentic assessment enhances academic performance, learner engagement, and higher-order thinking skills (Gulikers et al., 2004; Wiggins, 1998; Darling-Hammond et al., 2020), relatively limited attention has been given to its role in reshaping how learners perceive themselves after experiencing educational disruption. The present findings indicate that continuous authentic assessment enabled learners to gradually reconstruct their identities from individuals who previously viewed themselves as school dropouts or unsuccessful students into learners who recognized their own capabilities, accepted responsibility for their learning, and developed confidence in pursuing future educational opportunities. This process did not occur through isolated assessment events but evolved through repeated experiences of recognition, constructive feedback, reflection, and successful task completion that accumulated over time. Such findings resonate with Mezirow's (1997, 2000) Transformative Learning Theory, which argues that meaningful learning occurs when individuals critically reinterpret previous assumptions and reconstruct new perspectives through reflective experiences. Similarly, Sfard and Prusak (2005) conceptualize learning identity as a continuously negotiated narrative shaped through participation in educational experiences and social interactions. The findings of this study support these theoretical perspectives by demonstrating that authentic assessment functions not merely as an instructional strategy but also as a psychological catalyst that facilitates identity transformation through continuous recognition of learners' strengths and progress. Furthermore, these findings extend previous discussions on learner identity by illustrating that identity reconstruction can emerge from assessment practices intentionally designed to value individual growth rather than standardized performance. This contribution is particularly significant within community education contexts, where many learners have experienced prolonged educational exclusion, academic failure, or social stigma. By emphasizing progress instead of deficiency, authentic assessment provides learners with opportunities to reinterpret their educational experiences and

develop positive learner identities that support lifelong participation in education. Therefore, this study contributes to the growing body of literature by positioning authentic assessment as both a pedagogical and psychological intervention capable of fostering sustainable learner transformation rather than simply improving academic outcomes.

The findings also provide important practical and policy implications for advancing Sustainable Development Goal (SDG) 4, which seeks to ensure inclusive and equitable quality education, and SDG 10, which aims to reduce inequalities by expanding educational opportunities for marginalized populations. Within Indonesian community education, learners frequently present diverse educational histories, socioeconomic backgrounds, learning needs, and psychosocial challenges that cannot be effectively addressed through standardized assessment systems. The implementation of transformative authentic assessment within Personalized Learning Pathways demonstrates that assessment can become a strategic instrument for promoting educational equity by recognizing learners' diverse competencies, accommodating individual learning trajectories, and supporting continuous personal development. Consequently, educational success should no longer be defined solely by standardized academic achievement but also by learners' increasing motivation, confidence, self-efficacy, and reconstructed learning identities that enable them to participate meaningfully in lifelong learning. These findings further suggest that policymakers and practitioners should reconsider assessment policies within nonformal education by integrating portfolio-based assessment, reflective evaluation, individualized feedback, and continuous monitoring into institutional assessment frameworks. Such approaches not only strengthen learning outcomes but also contribute to learners' psychological well-being and educational resilience, particularly among those who have experienced interrupted educational pathways. Although this study focused on two Indonesian Community Learning Centers (PKBM), the conceptual relationship identified between authentic assessment, learner motivation, self-efficacy, and learner identity reconstruction provides a transferable framework that may inform similar educational contexts serving vulnerable and marginalized learners in other countries. Future research may expand these findings by employing longitudinal or mixed-methods approaches to examine how identity reconstruction develops over time and influences educational persistence, career development, and social inclusion. Overall, the present study demonstrates that authentic assessment should be understood not simply as a means of evaluating learning but as a transformative educational process capable of empowering learners psychologically while simultaneously supporting the broader objectives of equitable, inclusive, and sustainable education envisioned by SDG 4 and SDG 10.

CONCLUSION

Fundamental Finding: This study demonstrates that transformative authentic assessment embedded within Personalized Learning Pathways functions not only as an instructional assessment strategy but also as a psychological mechanism for reconstructing learner identity in Indonesian community education. By implementing continuous assessment, portfolio-based evaluation, reflective dialogue, individualized feedback, and ongoing learning monitoring, authentic assessment enhanced learners' motivation and self-efficacy while gradually transforming negative educational self-perceptions into positive learner identities. These findings extend existing authentic assessment literature by demonstrating that assessment can facilitate meaningful psychological transformation, particularly for

learners who have experienced educational disruption, school dropout, or marginalization. Consequently, authentic assessment should be understood as an integral component of learner development rather than merely a tool for measuring academic achievement. **Implication:** The findings have important implications for educational theory, practice, and policy. Theoretically, this study expands authentic assessment research by integrating learner identity reconstruction into Personalized Learning Pathways, thereby providing a broader understanding of assessment as a transformative educational process. Practically, the findings encourage educators to adopt portfolio-based assessment, reflective learning, continuous feedback, and personalized evaluation strategies that recognize learners' strengths and individual learning trajectories. At the policy level, these findings support the implementation of learner-centered assessment systems in community education and other alternative educational settings, contributing to the achievement of SDG 4 (Quality Education) and SDG 10 (Reduced Inequalities) through more inclusive, equitable, and psychologically supportive learning environments. **Limitation:** This study was conducted in two Indonesian Community Learning Centers (PKBM), limiting the generalizability of the findings to other educational contexts. In addition, the qualitative design focused on understanding learners' experiences and perceptions rather than measuring the long-term effects of transformative authentic assessment on academic achievement or educational persistence. Therefore, the findings should be interpreted within the specific socio-cultural context of Indonesian community education. **Future Research:** Future studies are encouraged to examine learner identity reconstruction using longitudinal and mixed-methods approaches to investigate how transformative authentic assessment influences learners' motivation, self-efficacy, educational persistence, and career development over time. Comparative studies across formal, nonformal, and informal educational settings are also recommended to evaluate the transferability of Personalized Learning Pathways and authentic assessment in diverse learning environments. Furthermore, future research may develop and validate a conceptual framework or measurement instrument for learner identity reconstruction to strengthen empirical evidence regarding the psychological impacts of authentic assessment across different educational contexts.

AUTHOR CONTRIBUTIONS

Afakhrul Masub Bakhtiar contributed to the conceptualization of the study, research design, data collection, investigation, formal analysis, data interpretation, visualization, and the preparation of the original manuscript draft. **Prof. Dr. Yatim Riyanto, M.Pd.** contributed to the conceptual framework, supervision, validation of the research process, critical review, and editing of the manuscript. **Prof. Dr. Sujarwanto, M.Pd.** contributed to methodology development, supervision, validation of the findings, critical review, and manuscript editing. All authors have read, reviewed, and approved the final version of the manuscript and agreed to its submission for publication.

CONFLICT OF INTEREST STATEMENT

The authors state that no financial or personal conflicts of interest exist that may have affected the content or findings of this research.

STATEMENT ON THE USE OF AI OR DIGITAL TOOLS IN WRITING

The authors declare that no artificial intelligence (AI) tools or other digital writing assistants were used in the preparation, analysis, or writing of this manuscript. All stages of the research process, including data analysis, interpretation, and manuscript writing, were conducted solely by the authors. The authors take full responsibility for the originality, accuracy, and integrity of the content presented in this article.

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