Porari flipped project model: A culturally responsive framework for learner-centred EFL instruction

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Project-based learning (PBL), flipped classroom (FC), and micro-learning have expanded opportunities for learner-centred learning in technology-enhanced English as a Foreign Language (EFL) education. However, these approaches are often implemented separately, which can limit continuity of learning, learner preparation, collaboration and the use of local culture. This conceptual paper proposes the Porari flipped project model as a culturally grounded, technology-enhanced instructional framework for learner-centred EFL instruction. The model integrates PBL, FC, technology-supported micro-learning, digital learning platforms and the Riau Malay Porari cooperative culture. PBL provides the project structure; FC organises learning across the before-, during- and after-class stages; technology-supported micro-learning provides continuous cognitive support; digital platforms support communication, collaboration, feedback, reflection and evaluation; and Porari guides collaboration through participation, shared responsibility and reciprocal support. The model contributes to educational technology by integrating pedagogical, technological, and cultural components into a single instructional design. It extends FC through a continuous three-stage learning cycle, positions technology-supported micro-learning as continuous cognitive support and uses the Porari cooperative culture as a pedagogical principle for organising collaboration in PBL. Future research should examine its implementation, effectiveness and adaptability across EFL and cultural contexts.

Implications for practice or policy:

- Lecturers can use the model to support learner-centred EFL instruction.
- Lecturers can organise technology-enhanced EFL learning through continuous before-, during- and after-class cycles.
- Lecturers can provide short digital resources as continuous cognitive support for preparation and collaborative projects through technology-supported micro-learning.
- Lecturers can utilise local culture as project content and a collaboration protocol for regulating participation and reciprocal engagement.
- Instructional designers may adapt the framework to different EFL and cultural contexts.

Keywords: project-based learning (PBL), flipped classroom (FC), micro-learning, Porari cooperative culture, technology-enhanced learning, EFL learner-centred learning, conceptual paper

Introduction

The rapid development of digital technology has changed the way English as a Foreign Language (EFL) is taught and learned. Learner-centred learning has become a key goal because it fosters active participation, collaboration, critical thinking and independent learning. Digital platforms, online

resources, and learning applications support learning inside and outside the classroom. However, technology alone does not improve learning. Learning improves when pedagogy and technology are organised through appropriate instructional design. Januszewski and Molenda (2008) define educational technology as the facilitation of learning through the creation, use and management of appropriate technological processes and resources. This view places instructional design at the centre of technology-supported learning by organising learning activities, digital resources and interactions into a coherent learning process. Therefore, EFL learning requires instructional designs that integrate pedagogy and digital technology to support learner-centred learning.

Project-based learning (PBL) is an instructional approach that supports learner-centred learning. Bell (2010) has explained that PBL engages learners in investigating authentic problems, creating meaningful products, and collaborating throughout project activities. Grant and Branch (2005) have described projects as learning experiences that promote inquiry and knowledge construction through authentic tasks. In EFL learning, these activities provide opportunities to communicate in English while discussing ideas, solving problems and completing projects (Bell, 2010; Larmer et al., 2015; Yang et al., 2021). Digital technology supports project work by providing access to information, learning resources, communication tools, collaborative workspaces and digital artefacts. Studies have shown that PBL improves collaboration, learner autonomy, critical thinking and English productive skills in technology-supported EFL learning (Astawa et al., 2017; Sari & Prasetyo, 2021; Ngadiso et al., 2021; Sultan et al., 2023; Syarifah et al., 2023; Yusri et al., 2021). However, implementing PBL often faces challenges, including uneven participation, free-riding behaviour, time constraints, difficulties in monitoring collaboration and limited support for maintaining participation throughout the project.

The flipped classroom (FC) approach complements PBL by addressing challenges in learner preparation and classroom time allocation. By reallocating content delivery to pre-class activities, the FC enables in-class time to focus on interaction, discussion, collaborative projects, instructor-supported practice and higher-order learning activities (Bergmann & Sams, 2012; Reidsema et al., 2017; Roehling, 2018). Students study learning materials before class through digital technology, while classroom meetings focus on discussion, collaboration and project activities. This design provides more opportunities to apply knowledge through interaction and collaborative problem-solving. Studies have reported positive effects on learner engagement, self-regulated learning and English language performance (Ahmad, 2016; Altas & Mede, 2021; Keskin, 2023; Pratiwi et al., 2022; Sukavatee, 2023). Nevertheless, FC primarily emphasises pre-class and in-class activities while providing limited support for systematic evaluation and reflection, as well as for collaborative continuity beyond classroom interaction. Learners also need short, focused learning materials when completing project tasks, as reviewing large amounts of content can increase the learning burden. These limitations highlight the need for instructional support that promotes continuity of learning and reduces the learning burden throughout the project.

Micro-learning helps reduce the learning burden by providing short, focused instructional units that align with cognitive load theory and accommodate learners' limited attention spans (Buchem & Hamelmann, 2010; Hug & Friesen, 2009; Khong & Kabilan, 2022). Studies have shown that micro-learning improves vocabulary, grammar, conceptual understanding, learning performance and flexible access to learning materials through digital platforms, and has also been integrated into FCs (Al-Zahrani, 2024; Fidan, 2023; Hosseini et al., 2020; Mardiana et al., 2023; Meng & Wang, 2016; Mohammed et al., 2018). However, micro-learning is often used as a stand-alone strategy or primarily to support pre-class preparation, resulting in limited alignment between individual preparation and collaborative project work. Consequently, learners have experienced disconnected instruction even though digital technologies and online learning platforms are available.

To support the use of authentic materials in PBL, local culture provides meaningful contexts that connect project tasks to learners' real-life experiences. Studies have integrated local culture into English learning to improve learner engagement, cultural awareness, cultural identity, writing performance and meaningful learning experiences (Aprianto & Sutarman, 2026; Barak & Yuan, 2021; Hossain, 2024; Marhamah et al., 2021; Ngan & Dan, 2025; Ratri et al., 2024, 2025). Most studies integrate local culture

as learning content to provide authentic contexts for language use. Nevertheless, cultural integration is often superficial and rarely embedded as a structural mechanism that regulates participation, collaboration and reciprocal engagement in technology-enhanced learning environments.

Studies have shown that PBL, FC, micro-learning, and culturally responsive learning each support learner-centred EFL learning through digital technology. However, these approaches are usually implemented separately without a coherent instructional framework that coordinates learner preparation, collaborative project learning, reflection, and culturally grounded participation. Existing models also do not position local cooperative cultural practices as collaboration protocols or align micro-learning with projects and the collaboration process within technology-mediated learning environments.

To address these gaps, this paper proposes the Porari flipped project model, a culturally grounded and technology-enhanced instructional framework for learner-centred EFL learning. The framework integrates PBL, FC, technology-supported micro-learning, digital learning platforms and the Riau Malay Porari cooperative culture (Rohana, 2017) into one instructional design. The Porari cooperative culture serves as a pedagogical principle that guides collaboration through reciprocal support, shared responsibility and collective participation. Digital technology supports access to learning resources and enables communication, collaboration, reflection, feedback and evaluation throughout the learning process.

The proposed framework contributes to educational technology by positioning local culture as a pedagogical principle for organising collaboration, extending the FC through a continuous before-class, during-class and after-class learning cycle, and positioning technology-supported micro-learning as continuous cognitive support throughout the project-based FC. Accordingly, this paper aims to (a) explain the theoretical foundations of the Porari flipped project model, (b) present its framework and operationalisation for technology-enhanced EFL learning and (c) propose instructional design principles for integrating pedagogy, technology and local culture in EFL learning.

Theoretical and conceptual foundations

PBL as the pedagogical foundation

PBL is a learner-centred instructional approach that engages learners in investigating authentic problems and producing meaningful project outcomes (Grant & Branch, 2005). Learning is organised around projects that require learners to investigate problems, explore ideas, gather information, collaborate with peers and develop solutions (Bell, 2010; Larmer et al., 2015). Lecturers guide the learning process, while learners take responsibility for completing projects and achieving the intended learning outcomes. Through inquiry, collaboration, communication, feedback and reflection, learners connect academic knowledge with authentic situations.

Educational technology supports PBL by providing access to learning resources, communication tools, collaborative workspaces, project development tools, assessment and learning records (Januszewski & Molenda, 2008). Online platforms also enable learners to continue project work beyond classroom meetings through discussion, resource sharing and collaborative problem-solving. As a result, technology supports project activities throughout the learning process and enables learners to collaborate from project preparation through reflection.

PBL has been explained from different perspectives. Bell (2010) has highlighted inquiry, collaboration, learner autonomy, authentic audiences, reflection and self-evaluation as PBL's main learning principles. Larmer et al. (2015) have identified the essential design elements of high-quality PBL, including a challenging problem or question, sustained inquiry, authenticity, student voice and choice, critique and revision, reflection and a public product. Gao et al. (2024) have organised project learning into three phases: planning, implementation and reflection. These perspectives provide the theoretical basis for the project component of the Porari flipped project model.

The project component incorporates Bell's (2010) learning principles, Larmer et al.'s (2015) project design elements and Gao et al.'s (2024) project phases. These perspectives guide the PBL organisation of four phases: planning, implementation, reporting and assessment, and reflection. The four phases are represented in eight connected project stages: (a) project preparation, (b) project topic exploration, (c) project design, (d) project construction, (e) project development, (f) project refinement, (g) project presentation and assessment and (h) project reflection. These stages are illustrated in Figure 1.

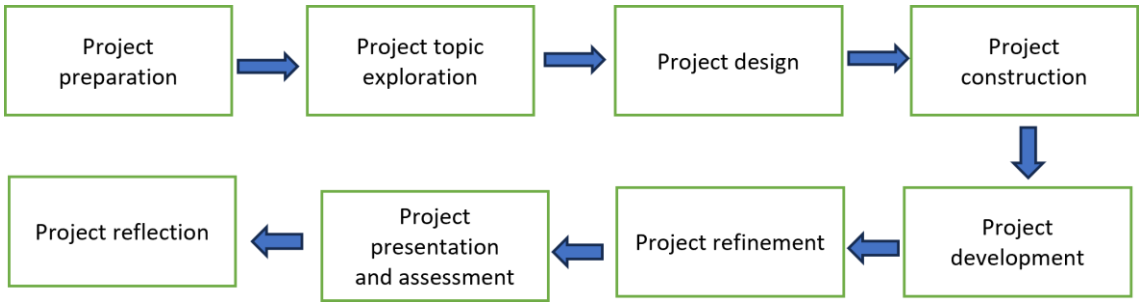


Figure 1. The stages of PBL

Figure 1 illustrates the eight-stage project structure and the role of technology throughout the project process. The stages form a connected process from project preparation to project reflection. Project preparation helps learners understand the learning goals, project requirements and needed resources. Project topic exploration asks learners to identify, discuss and propose project topics. Learners use digital learning resources to build background knowledge and prepare for the next stage of the project. Technology supports these two stages through digital learning resources, online communication and independent learning activities. During project design, learners determine project goals, plan project activities, assign responsibilities, prepare the project outline and decide how to complete the project. Technology supports this stage through information searching, communication, idea sharing and collaborative planning. Project construction focuses on building the initial project work through inquiry, collaboration and information gathering. During project development, learners develop and complete the project, while project refinement focuses on revising the project based on feedback and evaluation. Technology supports these stages through collaborative writing, discussion, resource sharing, feedback tools and project management. Finally, learners present and assess the completed project before conducting project reflection on their individual and group learning experiences. Technology supports these stages through presentation tools, peer assessment and learning documentation. Although lecturers provide project orientation, guidance and feedback throughout the project, learners remain responsible for proposing project topics, setting project goals, planning project activities, negotiating roles and developing the project outcomes. This structure strengthens learner agency and supports learner-centred learning by giving learners an active role throughout the project process.

The eight PBL stages form the project component of the Porari flipped project model. However, they do not define the repeated learning cycle. Instead, the stages are integrated into FC cycles as the project progresses.

FC as an instructional framework

FC was developed by Bergmann and Sams (2012) as a learning approach that changes the sequence of teaching and learning activities by shifting content delivery to pre-class and reserving in-class time for interaction and collaboration. Traditionally, the FC consists of pre-class and in-class learning (Reidsema et al., 2017; Roehling, 2018; Veres & Muntean, 2021). Learners study independently through digital learning resources in the pre-class stage. They participate in discussion, collaboration, problem-solving and lecturer-guided in-class learning activities. This organisation provides a structured learning process that combines independent learning with classroom interaction.

Advances in digital technology have strengthened the implementation of the FC. Technology provides access to instructional videos, online modules, quizzes, discussion forums, collaborative platforms and other digital learning resources before class (Al-Samarraie et al., 2020). During classroom learning, digital platforms support communication, collaboration, discussion, feedback and project activities (Diningrat et al., 2023; Dusengimana et al., 2023; Utami et al., 2023). In EFL learning, these technologies improve learner readiness, learning flexibility and collaborative learning (Keskin, 2023). Therefore, pedagogy and technology create learning environments that support active learning throughout the FC process.

FC provides a flexible instructional structure that organises learning across different learning stages. Reviews have indicated that most implementations continue to emphasise learner pre-class preparation and in-class collaborative learning (Al-Samarraie et al., 2020; Dusengimana et al., 2023). When integrated with PBL, learning naturally extends beyond classroom meetings because project completion requires repeated cycles of preparation, collaboration, revision, presentation, assessment and reflection across multiple project stages. Studies have also paid less attention to the role of technology in supporting reflection, evaluation, feedback and preparation for the next learning cycle after classroom activities. Therefore, this study extends the FC into a continuous three-stage instructional cycle that connects before-class, during-class and after-class learning. Within this framework, technology supports learner preparation, collaboration, reflection, and evaluation across all three stages, allowing the results of one learning cycle to support the next. The proposed FC cycle is presented in Figure 2.



Figure 2. FC cycle

Figure 2 illustrates the proposed FC cycle, which consists of three connected stages: before-class, during-class and after-class. These stages connect learner preparation, collaborative learning and reflection into one continuous learning cycle, with digital learning platforms supporting activities across all three stages. Learning resources are provided through digital learning platforms. Learners study these materials independently and explore additional learning resources before classroom meetings. These activities help learners prepare for the next stage of learning. In the during-class stage, learners apply their knowledge through project work, group discussion, and other collaborative learning activities. Digital platforms support communication, collaboration, resource sharing and feedback, while lecturers facilitate learning, monitor learners' progress, and provide guidance throughout classroom activities. In the after-class stage, learners reflect on their learning, evaluate their progress, review lecturers' evaluations and identify areas for improvement using digital learning platforms. Lecturers reflect on the teaching-learning process and evaluate learning outcomes. Reflection and evaluation from this stage become the starting point for the next learning cycle.

The arrows show that learning continues from one stage to the next. Reflection, feedback and evaluation from one learning cycle support learner preparation for the following cycle. This continuous organisation extends the conventional FC by integrating before-class, during-class and after-class learning into a single instructional cycle.

Micro-learning as cognitive support for technology-supported learning

Micro-learning is a technology-supported instructional approach that delivers learning through short, focused and goal-oriented learning units using digital technologies (Alias & Abdul Razak, 2023; Corbeil et al., 2023; Hug & Friesen, 2009; Kohnke, 2023). Effective micro-learning organises bite-sized content around a clear learning objective and presents concepts through structured learning sequences (Alias & Abdul Razak, 2023; Corbeil et al., 2023). This approach supports cognitive load theory by presenting information in manageable units, helping learners focus on essential knowledge before engaging in more complex learning tasks (Buchem & Hamelmann, 2010; Hug & Friesen, 2009).

Micro-learning resources can include short videos, digital modules, quizzes, podcasts, reading materials, project guidelines and language support (Corbeil et al., 2023; Gill et al., 2020; Kohnke, 2023). These resources provide flexible access to learning materials and allow learners to review specific concepts before and during learning activities (Al-Zahrani, 2024; Barus & Bontisesari, 2023; Kohnke et al., 2024). However, using different resource types does not, by itself, determine how micro-learning supports broader instructional design. Its value depends on how short learning units are connected to learning objectives and activities, and on the timing of instruction.

In EFL learning, technology-supported micro-learning has been used to support learner readiness, autonomous learning, motivation, knowledge retention and language learning performance (Dana et al., 2023; Hosseini et al., 2020; Mardiana et al., 2023; Meng & Wang, 2016). However, micro-learning has often been examined as a stand-alone instructional strategy, and few studies have combined it with flipped learning. Flipped micro-learning studies have mainly used short learning units for before-class preparation (Al-Zahrani, 2024; Fidan, 2023; Hosseini et al., 2020). Less attention has been given to integrating micro-learning with both flipped learning and PBL, particularly in collaborative project work. The use of micro-learning in class to provide short, focused support for project tasks has also received limited attention. These gaps indicate that research has not fully addressed how micro-learning can support learners across different stages of a collaborative project cycle.

In this study, technology-supported micro-learning is used in the before- and during-class stages of FC. Before class, bite-sized resources prepare learners for upcoming project activities. During class, the same short, focused resources support specific project tasks when learners need relevant information. In this way, technology-supported micro-learning supports learner preparation, reduces unnecessary cognitive load and facilitates continuous learning across successive project stages. Technology-supported micro-learning is integrated into FC to support PBL. FC organises the learning stages, while PBL provides the project structure and micro-learning supports learning within these stages. Figure 3 illustrates the micro-learning concept used in this study.

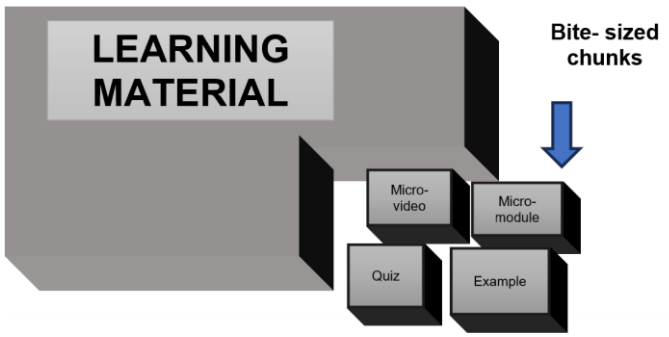


Figure 3. Micro-learning concept

Figure 3 illustrates how learning materials are divided into bite-sized digital resources, with each addressing a single learning objective or project task. These resources include short videos, digital modules, quizzes, reading materials, project guidelines, language support and instructor-prepared project topics, all accessible through digital learning platforms and mobile devices. By presenting information in manageable units, technology-supported micro-learning supports learner preparation before class and provides continuous cognitive support during project activities.

Although technology-supported micro-learning strengthens cognitive support, successful project learning also depends on authentic materials and effective collaboration. The materials draw on Riau Malay culture (Jamil et al., 2018) and are divided into small resources, with each resource focusing on one cultural concept or project requirement. Learners build cultural understanding progressively before applying it in collaborative projects. This organisation makes authentic cultural content accessible and directly connected to project activities.

Local culture and Porari cooperative culture as cultural foundation

Culture is an important part of English language learning because language is closely connected with its social and cultural context. Learning culture helps learners understand different perspectives, communicate appropriately and develop cultural knowledge, cultural awareness and cultural competence (Hossain, 2024; Nguyen, 2017). Culturally responsive teaching also values learners' cultural backgrounds and uses them to create meaningful learning experiences that encourage learner participation and engagement (Gay, 2018; Jabar, 2025). Therefore, culture contributes to both language learning and learners' meaningful participation in EFL classrooms. However, recognising learners' cultural backgrounds does not necessarily determine how culture is used in the learning process. The role of culture, therefore, needs to be considered not only in relation to what learners learn but also in how they participate in learning.

Local culture provides authentic contexts for English language learning. Studies have integrated local culture through teaching materials, authentic materials, digital learning resources, classroom activities and PBL (Aprianto & Sutarman, 2026; Erni et al., 2023; Marhamah et al., 2021; Ngan & Dan, 2025; Ratri et al., 2024, 2025; Sari et al., 2024; Septiyana et al., 2024; Shofyana et al., 2021; Warman et al., 2025). These studies have reported benefits for learner engagement, cultural awareness, cultural identity and English language learning. However, local culture is mainly used as learning content, including topics, materials, resources and project contexts. This focus leaves less attention to the values within local cultures that can guide how learners collaborate, share responsibility and support one another during project work. Thus, the pedagogical role of local culture remains less developed than its role as learning content.

This study extends the role of local culture from learning content to a pedagogical principle for collaborative learning, drawing on the Riau Malay cooperative tradition known as Porari. Porari is a traditional cooperative system practised by the Malay community in Rokan Hulu, Riau, Indonesia. It guides collaboration through mutual help, shared responsibility and reciprocity. According to Rohana (2017), Porari consists of three connected phases: *Membaok* (inviting participation), *Munjopuik* (working together) and *Membaya* (returning support). These phases guide collaboration across the PBL stages within the FC cycle. Figure 4 presents the three phases of the Porari cooperative tradition.

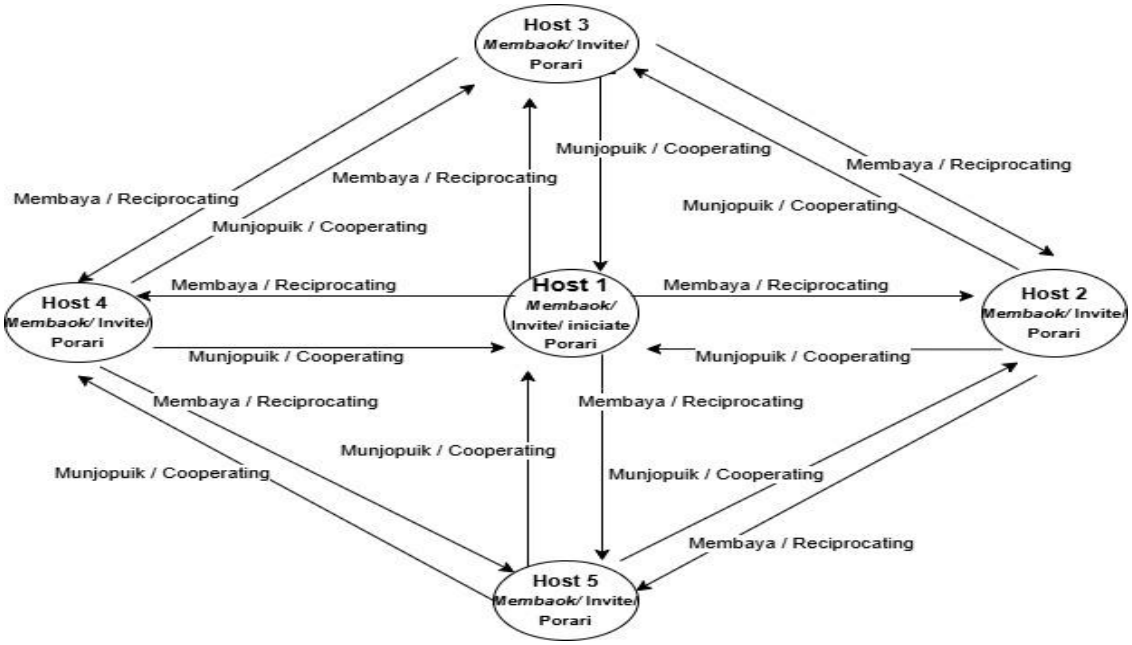


Figure 4. Phases of work completion in Porari cooperative culture

Figure 4 illustrates the three phases of the Porari cooperative tradition and their roles in collaborative learning. *Membaok* involves inviting others to participate in a shared activity. *Munjopuik* involves working together to complete the activity, while *Membaya* represents reciprocal support in which cooperation is returned. The figure shows these three phases across multiple hosts, illustrating that participation and cooperation are reciprocal and that different participants can take the host role. Thus, Porari organises collaboration through participation, cooperation and reciprocity rather than through one-way support. When integrated into technology-enhanced learning, digital learning platforms support communication, resource sharing, feedback and project documentation across collaborative activities, while Porari guides learners' participation and collaboration.

In the Porari flipped project model, the three phases are integrated into the PBL stages within the FC cycle. Porari provides the cultural principle for collaboration, while PBL organises project activities and FC organises learning across the three stages. Digital technology supports these activities throughout the project cycle. In this way, local culture functions as both learning content and an instructional design principle in technology-enhanced EFL learning.

Porari flipped project model framework

The Porari flipped project model integrates PBL, FC, technology-supported micro-learning, digital learning platforms and the Porari cooperative culture into one instructional framework for EFL learning. Each component has a distinct role in the model. PBL provides the project structure and stages for project implementation (Bell, 2010; Gao et al., 2024; Larmer et al., 2015). FC organises learning across before-class, during-class and after-class stages (Bergmann & Sams, 2012; Ngo & Yunus, 2021; Reidsema et al., 2017; Roehling, 2018). Technology-supported micro-learning provides short and focused learning resources for learner preparation before class and support during project work (Buchem & Hamelmann, 2010; Hug & Friesen, 2009; Khong & Kabilan, 2022; Kohnke, 2023; Kohnke et al., 2024). Local culture provides the learning content and collaboration protocol through the Porari cooperative culture, which guides collaboration through the *Membaok*, *Munjopuik* and *Membaya* phases (Rohana, 2017). Technology-enhanced learning connects these components by supporting communication, resource sharing, discussion, collaboration, feedback, reflection and evaluation throughout the learning process. Figure 5 presents the Porari flipped project model.

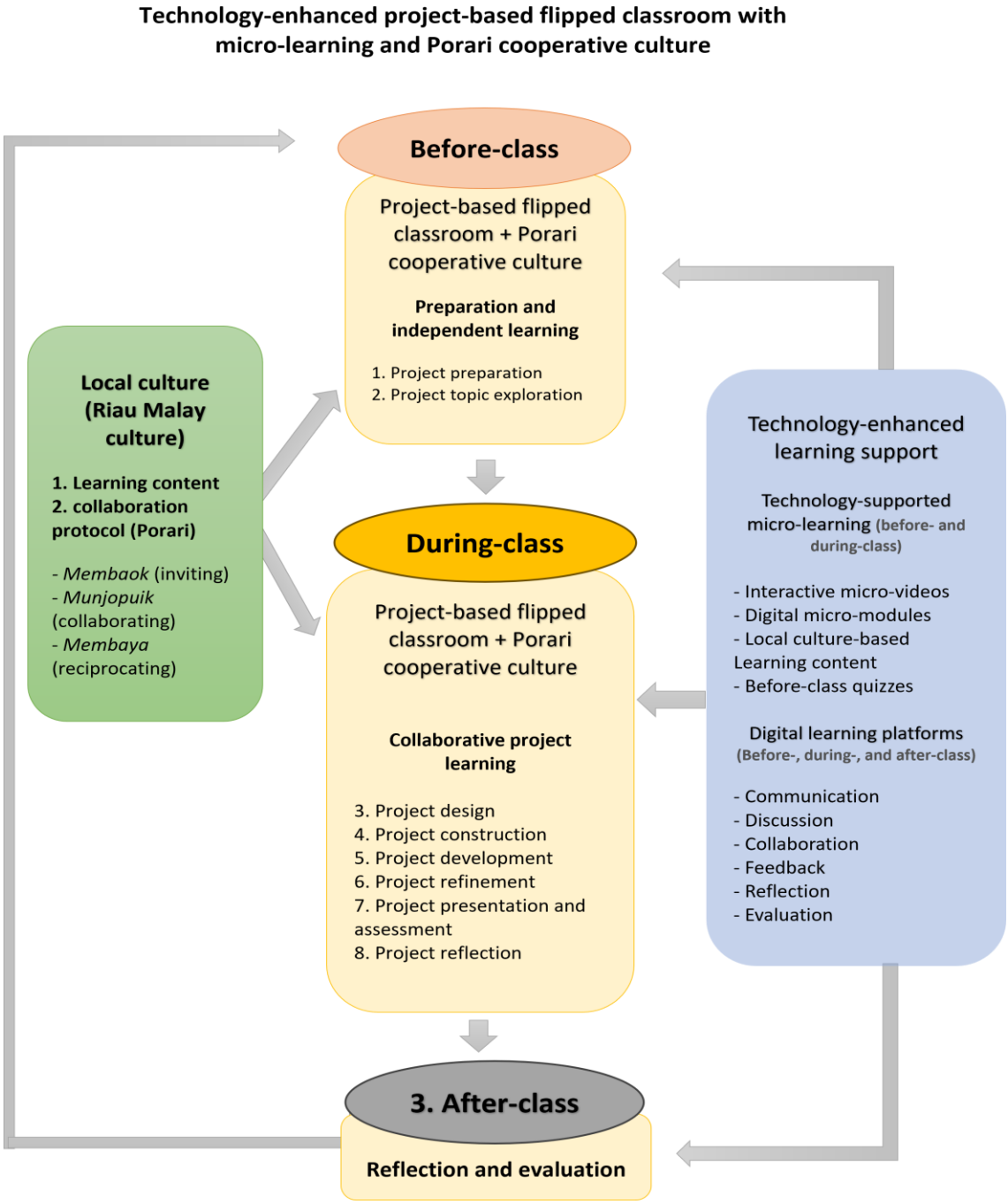


Figure 5. Porari flipped project model

Note. Porari: A traditional system of communal cooperation practised by the Malay community, which is rooted in the values of mutual assistance (Gotong Royong) and reciprocity. *Membaok:* Host invites peers to work on the project cooperatively (the new host who initiates the Porari). *Munjopuik:* Peers join host's group and contribute to host's project work (the peers who assist the host and participate in reciprocal cooperation). *Membaya:* Previous host reciprocates peers' help in return (the previous host returns collaborative support or repays Porari).

Figure 5 illustrates how the Porari flipped project model organises learning. The framework has three connected FC stages: before-class, during-class and after-class. These three stages form a learning cycle that is repeated until the project is completed. PBL stages are embedded within these stages through eight project stages. Two stages are included in the before-class stage, and six stages are included in the

during-class stage. The after-class stage focuses on reflection and evaluation, providing input for the next before-class stage. Riau Malay culture provides learning content and the Porari collaboration protocol for the before- and during-class stages. Technology-supported micro-learning provides short and focused learning resources for preparation, independent learning and collaborative learning (before- and during-class), and digital learning platforms support learning activities across all three stages. The arrows show the connection among the three stages and how the outcome of one learning cycle supports the next.

The framework comprises three interrelated stages:

1. Before-class (preparation and independent learning stage): The before-class stage supports preparation and independent learning for project work. It combines PBL, FC, local culture and technology-supported learning. At the beginning of the project, the before-class stage covers project preparation and project topic exploration. In the following cycles, before-class activities prepare learners for the next PBL stage. Riau Malay culture provides learning content, while the Porari process begins with *Membaok*, in which learners are invited to participate in the upcoming collaborative project. Technology-supported micro-learning provides interactive micro-videos, digital micro-modules, local culture-based learning content and before-class quizzes. These short and focused resources support preparation and independent learning. Digital learning platforms provide access to learning materials and support communication and discussion. The preparation developed in this stage supports the collaborative project work during class.

2. During-class (collaborative project stage): The during-class stage is the main collaborative stage of each cycle. It includes project design, project construction, project development, project refinement, project presentation and assessment and project reflection. These stages organise the project's development through collaboration. Riau Malay culture remains part of the project content, while the Porari cooperative culture guides collaboration. *Membaok* supports participation, *Munjopuik* supports cooperation and *Membaya* supports reciprocal help and shared responsibility. Technology-supported micro-learning remains available for specific project tasks. Digital learning platforms support communication, discussion, collaboration, feedback and resource sharing. This stage connects learners' preparation with collaborative project learning.

3. After-class (evaluation and reflection stage): The after-class stage focuses on reflection and evaluation after each learning cycle. Learners and lecturers review the learning and project process and consider progress and areas for improvement. Digital learning platforms support feedback, reflection, evaluation and learning records. The results of this stage provide input for the next before-class stage. In this way, reflection and evaluation connect one learning cycle with the next until the project is completed.

The Porari flipped project model integrates pedagogical theory, culturally responsive practice and technology-enhanced learning into a coherent framework for collaborative EFL instruction. The framework integrates these components within a repeated learning cycle that connects preparation, project work, reflection and evaluation. Four instructional design principles emerge from the framework:

- PBL provides a clear sequence of project activities from project preparation to project reflection.
- FC connects before-class preparation, during-class project work and after-class reflection and evaluation in a repeated learning cycle.
- Technology-supported micro-learning provides short and focused learning support before class and during project work.
- The Porari cooperative tradition guides participation, cooperation, shared responsibility and reciprocal support during project work.

Operationalisation of the Porari flipped project model in EFL

The operationalisation of the Porari flipped project model illustrates its application in technology-enhanced EFL learning in higher education. The framework supports English language learning across

various EFL skills and related areas through an integrated instructional design. This operationalisation does not prescribe a fixed teaching procedure. Instead, it shows how lecturers and learners apply the design principles across repeated before-class, during-class and after-class learning cycles. The operationalisation of the Porari flipped project model is presented in Figure 6.

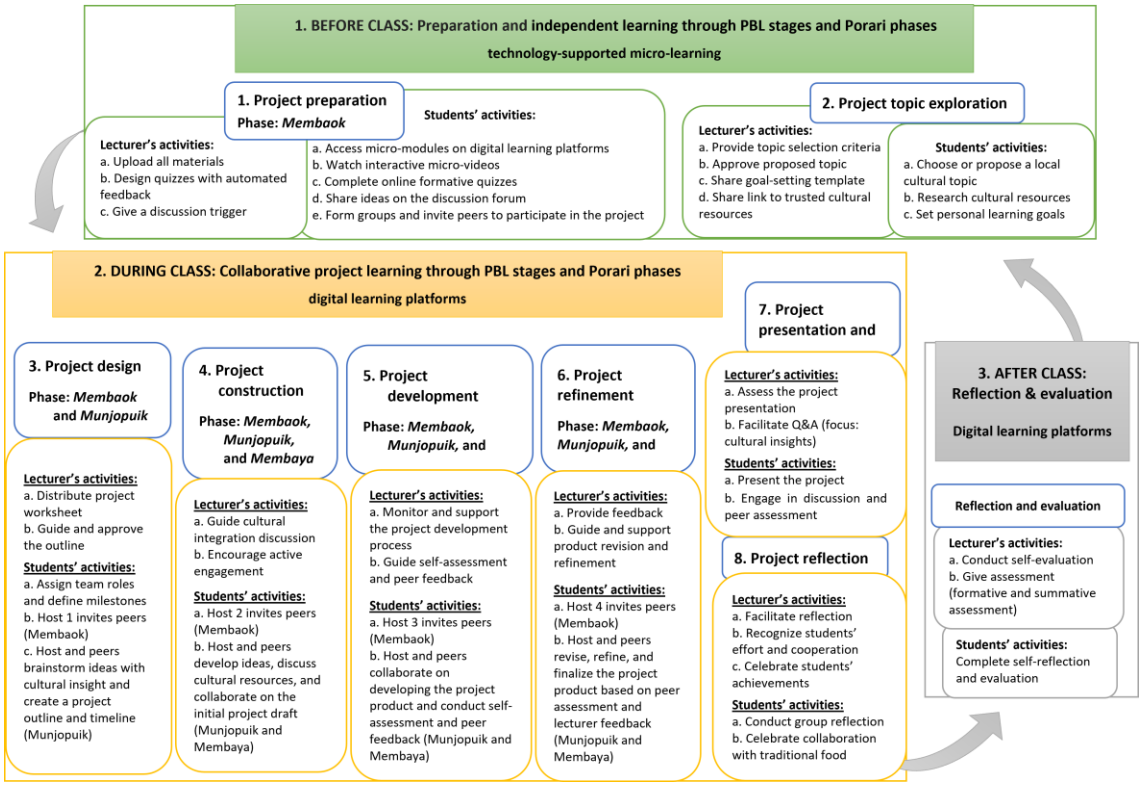


Figure 6. Operationalisation of Porari flipped project model

Note. Porari: A traditional system of communal cooperation practised by the Malay community, which is rooted in the values of mutual assistance (Gotong Royong) and reciprocity. *Membaok:* Host invites peers to work on the project cooperatively (the new host who initiates the Porari). *Munjopuik:* Peers join host's group and contribute to host's project work (the peers who assist the host and participate in reciprocal cooperation). *Membaya:* Previous host reciprocates peers' help in return (the previous host returns collaborative support or repays Porari).

Figure 6 illustrates the operational flow of the Porari flipped project model. Learning is organised into repeated before-class, during-class, and after-class cycles until all PBL stages are completed. Before-class preparation takes place in every cycle and prepares learners for the next project activity. Each cycle integrates technology-enhanced learning, while technology-supported micro-learning and the Porari cooperative culture support the before- and during-class stages. The following sections describe the activities of lecturers and learners at each stage.

The before-class stage prepares learners for the next project activity. Lecturers provide technology-supported micro-learning resources through digital learning platforms, including micro-videos, digital micro-modules, quizzes, project guidelines, language support and local culture-based learning materials. At the beginning of the project, lecturers introduce the project, its learning objectives, requirements, assessment criteria and timeline. Learners study the resources, complete the assigned activities, explore local cultural resources and prepare ideas for the next project activity. In the first cycle, learners complete project preparation and project topic exploration by learning about the project, identifying possible topics, discussing their ideas and proposing cultural project topics before forming project groups. In each cycle, the designated host group conducts *Membaok* by inviting peers from other groups to participate in the upcoming project activity via digital communication. Lecturers monitor participation, facilitate online discussion and identify learning needs through the digital learning platform.

The during-class stage is the main collaborative stage of each cycle. Learners complete the PBL stages in line with project progress. After *Membaok*, peers who have not yet served as hosts help the host through *Munjopuik*, while peers who have already served as hosts help through *Membaya* by returning the support they previously received. The host role rotates across project activities so that each group can both receive support as a host and return support as a peer. The host and invited peers work together on the assigned project task, while each group continues to develop its own project with its original members. Technology-supported micro-learning remains available for specific project tasks, while digital learning platforms support communication, discussion, collaboration, resource sharing, feedback, document sharing and project management.

During project design, lecturers guide learners in setting project goals, planning activities, assigning responsibilities, preparing the project timeline and milestones and organising the project outline. Host 1 and invited peers discuss ideas, explore local cultural resources, assign responsibilities and develop the project outline through *Munjopuik*. As this is the first host activity, *Membaya* is not used at this stage. During project construction, Host 2 and invited peers gather information, develop ideas, and build the initial project product through *Munjopuik* and *Membaya*. During project development, Host 3 and invited peers develop and improve the project product through discussion, information sharing and feedback through *Munjopuik* and *Membaya*. During project refinement, Host 4 and invited peers review feedback, revise the project and finalise the project product through *Munjopuik* and *Membaya*. Lecturers monitor project progress, facilitate discussions on cultural integration and provide guidance and feedback. Technology supports planning, collaboration, revision, and documentation through learning management systems, discussion forums, shared online documents and peer-feedback tools. During the project presentation and assessment, learners return to their original groups to present their completed projects, respond to questions and participate in peer assessment. At the same time, lecturers assess presentations and facilitate question-and-answer sessions. During project reflection, learners reflect on the final product, including their individual contributions, group collaboration, achievement of project goals and experiences as hosts and invited peers. Technology supports assessment and reflection through online feedback forms, digital reflection journals and electronic portfolios. The project concludes with learners sharing traditional Riau Malay food as a symbol of appreciation, shared achievement and the values of the Porari cooperative culture.

The after-class stage takes place at the end of each learning cycle. Learners reflect on what they have learned, evaluate their participation and project progress, identify areas for improvement and set goals for the next cycle. Lecturers review the teaching process and evaluate learner progress and project outcomes. Digital learning platforms support reflection, evaluation, learning records, electronic portfolios and progress monitoring. The results of reflection and evaluation guide the next before-class stage. The cycle then continues until all eight PBL stages are completed.

Discussion

This study proposes the Porari flipped project model as a culturally grounded and technology-enhanced instructional framework for EFL learning. The model addresses limitations in previous studies by integrating PBL, FC, technology-supported micro-learning, digital learning platforms and the Porari cooperative culture into a single instructional design. PBL provides an eight-stage project structure; FC organises learning into repeated before-class, during-class and after-class cycles; technology-supported micro-learning provides short, focused learning support; and Porari organises collaboration. Digital learning platforms connect these components through communication, resource sharing, collaboration, feedback, reflection and evaluation. The model provides a clear structure for connecting pedagogy, technology and local culture in learner-centred EFL learning.

The model uses PBL as the main structure for project learning and extends its use by placing the eight project stages within repeated FC cycles. This structure draws on the PBL principles of Bell (2010), the project design elements identified by Larmer et al. (2015) and the project phases discussed by Gao et al. (2024). The contribution is not a new set of PBL stages, but the way these stages are organised within

repeated FC cycles and supported by technology and the Porari cooperative culture. This organisation allows project activities to progress in line with project development, while learners receive preparation, collaborative learning and reflection throughout the learning cycle.

The Porari flipped project model establishes a continuous FC learning cycle that connects before-class, during-class and after-class learning in technology-enhanced EFL instruction. Technology supports learner preparation before class, collaborative learning during class and reflection and evaluation after class across repeated learning cycles. This model extends FC implementations, which primarily organise learning around learner preparation before class and collaborative activities during classroom meetings (Bergmann & Sams, 2012; Reidsema et al., 2017; Roehling, 2018). It also extends earlier studies reporting the benefits of the FC for learner engagement, self-regulated learning and English language performance (Ahmad, 2016; Altas & Mede, 2021; Keskin, 2023; Pratiwi et al., 2022; Sukavatee, 2023) by showing how technology-supported reflection and evaluation after class can maintain learning continuity. The after-class stage enables learners and lecturers to use feedback from one cycle to prepare for the next, maintaining continuity throughout the project.

The Porari flipped project model also extends the role of technology-supported micro-learning in EFL learning. Within the model, authentic cultural learning content is organised into bite-sized digital resources that support learner preparation and collaborative project work across repeated learning cycles and project stages. Micro-learning studies have mainly used short digital resources to support learner motivation, conceptual understanding, language learning and access to learning materials (Al-Zahrani, 2024; Barus & Bontisesari, 2023; Fidan, 2023; Ghafar et al., 2023; Hosseini et al., 2020; Mohammed et al., 2018). The model extends this use by aligning bite-sized resources with learning stages and project activities, so that learners receive focused cognitive support before class and during project work. Thus, micro-learning is not limited to before-class preparation but remains available when learners need support during collaborative project activities.

The Porari flipped project model also extends the role of local culture in technology-enhanced EFL learning. Within the model, the Porari cooperative tradition organises learner collaboration through the *Membaok*, *Munjopuik* and *Membaya* phases across project activities. Digital technology supports communication, document sharing, feedback and interaction during these activities. This model extends studies that have mainly used local culture as learning content to improve learner engagement, cultural awareness, cultural identity and English language learning (Aprianto & Sutarman, 2026; Erni et al., 2023; Marhamah et al., 2021; Ratri et al., 2024, 2025; Shofyana et al., 2021). It extends the role of local culture from instructional content to a pedagogical principle that guides collaborative participation in technology-enhanced EFL learning.

The Porari flipped project model contributes to educational technology scholarship by demonstrating how technology can integrate pedagogical, learning, collaborative and cultural elements within a single instructional framework. Technology functions not only as a means of delivering learning resources but also as a learning environment that links project activities, micro-learning, collaborative work and culturally grounded participation. This integrated design connects digital resources with pedagogy and culturally grounded collaboration in EFL learning.

Limitations and future research

This paper focuses on the design and operationalisation of the Porari flipped project model and does not include empirical implementation or evaluation in EFL classrooms. Therefore, the model's effectiveness, the interactions among its components and its influence on teaching and learning have not yet been examined. The framework is also grounded in the Riau Malay Porari cooperative culture, so further study is needed to assess its applicability to other cultural, educational and sociocultural contexts.

Future research should implement and evaluate the model in EFL classrooms. Design-based research could support its implementation, evaluation and refinement through repeated cycles of classroom practice and reflection. Comparative studies could examine the model against conventional PBL, FC and

other technology-enhanced approaches. Further studies could examine its use across different EFL skills, learner characteristics, and educational settings, as well as how culturally based collaboration protocols can be adapted to other contexts while maintaining the core instructional design principles.

Conclusion

This paper proposes the Porari flipped project model as a culturally grounded and technology-enhanced instructional framework for learner-centred EFL education. The model integrates PBL, FC, technology-supported micro-learning, digital learning platforms and Porari cooperative culture into a single instructional design. PBL provides an eight-stage project structure; FC organises repeated before-class, during-class and after-class cycles; technology-supported micro-learning provides focused cognitive support; and Porari organises collaboration through shared responsibility and reciprocal support. Digital learning platforms connect these activities through communication, collaboration, feedback, reflection and evaluation. These components address learning continuity, collaborative learning and the integration of local culture in EFL education.

The main contribution of this study is an instructional design that connects these complementary functions within technology-enhanced EFL learning. The model links bite-sized learning resources with project activities before and during class, while the after-class stage connects reflection and evaluation to the next learning cycle. The rotating host structure enables learners to receive and return support through the Porari cooperative process. As a conceptual study, this paper provides a theoretical foundation, instructional design framework and operationalisation of the model. Future empirical research should examine its implementation, effectiveness and adaptability across EFL and cultural contexts.

Author contributions

Batdal Niati: Conceptualisation, Resources, Visualisation, Writing – original draft, Writing – review & editing; **Slamet Setiawan:** Conceptualisation, Supervision, Writing – original draft, Writing – review & editing; **Ahmad Munir:** Visualisation, Resources, Supervision, Writing – review & editing.

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