

Exploring the needs of TPACK-based learning activity types website analysis for the seventh graders

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ABSTRACT

This study investigates the requirements of seventh-grade students and English teachers in Bangka Belitung for a TPACK-based Learning Activity Types (LATs) website to enhance English language acquisition. The research utilised a concurrent triangulation mixed-methods approach to reconcile student learning preferences with available instructional materials. Data were gathered from 99 seventh-grade students using a needs analysis questionnaire and from four English teachers through semi-structured interviews at SMP Negeri 5 Pangkalpinang. Quantitative data demonstrate that whereas students exhibit robust basic communication abilities (93% accuracy in welcomes), substantial deficiencies are seen in morphosyntax and tense construction (55% accuracy). Students demonstrated a strong inclination for interactive, audiovisual learning (92%) on subjects including Family (85%) and Environment (82%). Qualitative findings from teacher interviews indicate a "Infrastructure Paradox": although there is complete computer access in schools, bureaucratic obstacles and insufficient teacher confidence hinder successful utilisation. Educators recognised an urgent requirement for a "ready-to-use," offline-capable toolbox to address these logistical challenges and conform to the Kurikulum Merdeka. The triangulated findings highlight the urgent need for a contextually relevant, mobile-responsive digital platform designed according to TPACK principles to enhance student engagement and assist instructors in addressing particular pedagogical and infrastructural challenges.

Keywords: English LAT's activity; TPACK-based analysis; English learning; Multimodality; TPACK Needs Analysis; English materials

INTRODUCTION

The swift incorporation of technology in education has revolutionised teaching and learning methodologies, underscoring the significance of Technological Pedagogical Content Knowledge (TPACK) for effective instruction. TPACK denotes the framework that amalgamates the trends of technology with pedagogy and content understanding, empowering educators to convey subject matter proficiently while integrating technological tools (Cheung & Jang, 2020a; Usman et al., 2022; Wu, 2013).

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In response to this necessity, Learning Activity Types (LATs), which provide diverse instructional activities aligned with specific learning outcomes, have evolved as an effective framework for building technology-enhanced learning experiences (Harris, 2009; Harris & Hofer, 2011; Hutchison & Woodward, 2014).

Notwithstanding the increasing acknowledgement of TPACK and LATs, a substantial gap persists in meeting the distinct educational requirements of varied student demographics, especially in areas like Bangka Belitung, Indonesia. The distinctive socio-cultural environment, along with the advancing technical framework, offers both opportunities and problems in the implementation of TPACK-based Learning and Teaching strategies (Devi & Ikhsanudin, 2023; Rohmitawati, 2018). Furthermore, seventh-grade children necessitate a tailored approach that corresponds with their cognitive development, regional curricular standards, and accessible resources. Indonesian educators should base their technological integration on explicit learning objectives, pertinent tools, established engagement principles, and robust theoretical frameworks—rather than depending solely on personal experience—are more inclined to create effective language learning tasks that truly enhance student achievement (Mali, 2024).

In Bangka Belitung, as in numerous regions of Indonesia, the incorporation of English learning resources into educational methodologies encounters various persistent obstacles. The challenges arise from deficiencies in infrastructure, teacher proficiency, curricular limits, and socio-cultural influences (Handayani & Aprilliandari, 2022; Handayani & Kurnia, 2022; Manalu, 2019a). On top of that, the majority of learners communicate in local dialects or languages at home, with Bahasa Indonesia serving as a second language for some. Acquiring English necessitates traversing many linguistic strata, which may hinder the utilisation of English learning resources that are not tailored to local linguistic settings. The cultural significance and updated of media is essential for student engagement, and foreign-produced digital content may lack resonance with students, moreover in areas such as Bangka Belitung (Hamied, 2012; Ratri & Tyas, 2022). Unfortunately, teachers in Indonesia frequently demonstrate a deficiency in confidence and proficiency in employing ICT for language instruction, instead depending on conventional methodologies due to inadequate professional development (Cahyani & Cahyono, 2012; Pradnyawati et al., 2023; Susandi, 2023a; Zatulo, 2022). This research paper focuses on conducting a comprehensive needs analysis of a TPACK-based LATs website tailored for seventh-grade students in Bangka Belitung. The analysis aims to identify the specific technological, pedagogical, and content-related needs of students and educators in the region, with the goal of creating an online platform that enhances both teaching and learning. By addressing these needs, this study seeks to contribute to the development of contextually relevant, technology-integrated instructional practices that improve learning outcomes for seventh-grade students in Bangka Belitung.

METHODS

This study employed a concurrent triangulation mixed-methods design to thoroughly explore the needs for a TPACK-based Learning Activity Types (LATs) website among seventh-grade students and their English teachers. In this design, quantitative data from student questionnaires gave statistical proof of learner proficiency levels, topic preferences, and technology attitudes, analyzed through descriptive statistics (means, frequencies, percentages). Simultaneously, qualitative data (QUAL) from semi-

structured teacher interviews offered in-depth insights into pedagogical facts, application barriers, and professional needs, analyzed via thematic coding. The two strands were collected concurrently, analyzed separately, then integrated through data triangulation to identify convergence (e.g., shared perceptions of grammar gaps), complementarity (e.g., teachers explaining student survey paradoxes), and expansion (e.g., logistical barriers invisible in student data). This technique addresses Creswell's emphasis on mixed methods for capturing complex educational phenomena while validating findings across stakeholder perspectives (Creswell, 2012). The study was conducted at SMP Negeri 5 Pangkalpinang, an urban public junior secondary school serving 210 seventh-grade students in Bangka Belitung, Indonesia. Convenience sample of 99 seventh-grade students (48 males, 51 females; ages 12–13). Of these, 91% (n=90) reported enjoying English class (M=4.3/5, SD=0.8), yet only 8% (n=8) participated in extracurricular programs, with 78% (n=77) relying solely on formal instruction—indicating high motivation but limited exposure. Purposive sample of 4 English teachers (2 experienced [>10 years]; selected for clarity in TPACK proficiency and teaching tenure. Questionnaires and interviews were administered during regular school hours with institutional approval. Participation was voluntary, with informed consent obtained.

Student needs analysis questionnaire (Cronbach's $\alpha=0.82$): A 15-item instrument aligned with TPACK domains, including four sections: 1) biodata (gender, prior school, resource access), 2) English proficiency (7 multiple-choice grammar/vocabulary items), 3) Topic preferences (5 multi-select items: family, environment, technology, friends, school life), 4) Media/activities (3 Likert-scale items [1=Strongly Disagree–5=Strongly Agree] on textbook vs. technology-enhanced learning). Meanwhile, the teacher Semi-structured interview guide: A 9-item protocol (30–45 minutes per interview) organised into three TPACK domains: (a) technological knowledge, (b) Pedagogical Content Knowledge/Curriculum, (c) TPACK integration/website needs. Interviews were audio-recorded, transcribed verbatim, and conducted in Bahasa Indonesia with English translation for analysis. To analyse the data, the author applied SPSS v.26 program to generate descriptive statistics such as means, SD, frequencies, percentages, to assess proficiency gaps, preferences, and attitudes. While the qualitative data were analysed by applying many procedures; familiarizing the data, first coding, establishing the theme, reviewing, and interpreting.

RESULTS

Students need

Ninety-nine seventh-grade students filled out the questionnaire distributed by the researchers. Among the four sections asked within the instrument, two topics will be discussed in the results, they are; English prior knowledge and English learning activities preferences.

English prior knowledge

In this section, ten questions were provided, but only 7 questions covered the English grammar questions, and the other three were the get-to-know questions. The first question is about the right way to greetings in English. Table 1 presents performance on grammar and foundational communication items. The overall mean score was 6.2/7

(SD=1.4), indicating moderate proficiency with notable gaps in morphosyntactic domains.

Table 1. English Prior Knowledge

| Question Topic | Example Item | Correct Answer | % Correct (n) | % Incorrect Breakdown | Mean Score |
|-------------------------|----------------------------------|-----------------------------|---------------|--------------------------------|--|
| Communicative Basics | | | | | |
| Greetings | What do you say in the morning? | Good morning / How are you? | 93% (92) | 7% (wrong time/phrase) | Strong foundational knowledge |
| Self-introduction | "How do you introduce yourself?" | My name is... / I am... | 95.8% (95) | 4.2% (grammatical errors) | Highest performance |
| Morphosyntax | | | | | |
| Possessive pronouns | "This is ___ book." | my | 72% (71) | 28% (his 10%, her 12%, our 6%) | Moderate difficulty |
| Subject-verb agreement | "He ___ to school every day." | goes | 58% (57) | 36% go, 4% went, 2% has | Significant gap |
| Gender pronouns | "I have a sister. ___ is smart." | she | 58% (57) | 19% he, 15% they, 8% it | Conceptual confusion I |
| I Plural copula (to be) | They ___ happy. | are | 65% (64) | 25% is, 10% was/am | Singular overgeneralization |
| Tense Formation | | | | | |
| Simple past | Yesterday I ___ football. | played | 55% (54) | 30% play, 15% plays/playing | Lowest performance; -ed suffix confusion |
| Overall Mean (SD) | | | 72% | | 6.2/7 (1.4) |

The data showed that approximately 58% of pupils recognise that the correct completion of the pronoun "he" involves the addition of the verb "go" with the suffix "es," resulting in "goes." Approximately 36% of students selected the term "go," while the remainder opted for "went" and "has." The second question about the selection of a pronoun for a female topic revealed that approximately 58% chose "she," 19% opted for "he," while the remainder selected "they" and "it." The final

two images depict the enquiries regarding basic tenses. The kids demonstrated strong comprehension, as reflected by over 50% answering the first question correctly. Moreover, the right to be picked was "are" in the final question and was addressed successfully by the students. In addition, Students demonstrated strong proficiency in communication tasks (greetings 93%, introductions 95.8%) but encountered difficulties with grammatical morphology and tense construction. The 58% accuracy in subject-verb agreement and 55% in the simple past indicate a necessity for systematic, scaffolded grammar instruction—ideal possibilities for LAT-based exercises and audiovisual support.

English learning activities preferences

For the topics of English learning preferences, the researchers provided some topics to be selected such as family, environment, friendships, schools, and technology. As many as 46% chose to have these topics to be studied at school. The description is described in Table 2.

Table 2. Topic preferences

| Topic | % Selecting (n) | Example LAT Match |
|-------------|-----------------|--------------------------|
| Family | 85%(85) | Digital storytelling |
| Environment | 82%(74) | Collaborative projects |
| Technology | 78%(77) | Webquests/quizzes |
| Friends | 75%(74) | Role-play dialogues |
| School life | 62%(61) | Simple writing structure |

The students are also asked about the media preferences which can be selected in multi-select: websites 89% (88), videos 71% (70), apps 62% (61), games 55% (54). Likert results (Table 3) showed consensus on tech integration.

Table 3. Likert scale result

| Statement | M (SD) | % Agree/Strongly Agree |
|--|-----------|------------------------|
| Prefer websites over textbooks | 4.6 (0.7) | 94% |
| Need audiovisual and learning projects | 4.5 (0.8) | 92% |
| Current English classes lack tech | 4.2 (0.9) | 85% |

Teachers' perspectives

Infrastructure accessibility and usage

A significant discovery from the qualitative data is the disparity between technology availability and its actual use in the classroom. All four teachers affirmed that the school has a computer lab and internet connectivity, although they collectively characterised these facilities as almost unusable for daily instruction. Educators indicated that reserving the computer lab necessitates traversing intricate bureaucratic obstacles that deplete essential instructing time.

"We have the computers, yes. But to use them, I must book the room days in advance. Then, moving 30 students there takes 10 minutes. By the time they log in, half the lesson is gone. It is easier to just stay in the classroom

and use the textbook." — Teacher T2

Unreliable internet was identified as a key obstacle to the development of website-based education. Educators reported recurrent Wi-Fi disruptions, slow loading speeds, and simultaneous bandwidth contention across multiple courses, leading to their hesitation to base entire lessons on online resources.

"I am afraid to plan a lesson around a website. If the Wi-Fi goes down—which happens often—I have no backup. I need a tool that works offline or is very light to load." — Teacher T1

Several teachers added that they sometimes resort to using their personal mobile data to show short videos, but this strategy is unsustainable and depends on the teacher's own device and internet quota. This structural constraint directly explains the quantitative finding that 78% of students rely solely on formal, non-digital instruction and have limited exposure to tech-enhanced learning, despite 100% reporting that their school has technological facilities. It suggests that the proposed LATs website must support offline functionality, low-bandwidth design, or mobile-based access that can be used directly in the regular classroom, without relying on lab bookings or heavy streaming.

Pedagogical skill

The interviews revealed a stark contrast between the teachers' desire to use technology and their confidence in doing so. All participants expressed strong support for the idea of TPACK-based instruction (aligning with the students' 92% demand for interactive media), but admitted to lacking the technical skills to create it themselves. Teachers view themselves as consumers of content rather than creators. They are eager to use high-quality digital tools if provided but feel overwhelmed by the prospect of designing them.

"I know the students are bored with the book. I want to show them videos or play games like the students want. But I don't know how to make a quiz app or a website. If you give me the link, I will use it. But I cannot build it." — Teacher T2

Teachers highlighted specific deficits in Technological Content Knowledge (TCK). They struggle to find digital resources that match specific grammar points like the "Past Tense," which the quantitative data identified as a major student weakness (55% accuracy).

"Teaching 'Simple Past' is hard. I need a video that compares Indonesian time markers with English verbs. I can't find one that fits our local context." — Teacher T1

Others remarked that numerous online activities are either excessively advanced, overly vague, or misaligned with the examples and frameworks mandated by Kurikulum Merdeka, compelling them to revert to conventional explanations and board work. These narratives indicate that the issue extends beyond mere "low technological proficiency" to encompass the lack of reliable, curriculum-aligned digital resources that educators may readily utilise. This discovery confirms the necessity for the proposed website to function as a "ready-to-use" toolkit—offering

pre-assembled, curriculum-aligned Learning Activity Templates (LATs) (e.g., digital storytelling templates, interactive grammar exercises, and basic webquests) that necessitate minimal technical configuration and can be seamlessly incorporated into existing lesson plans with minimal extra preparation. This finding validates the need for the proposed website to be a "ready-to-use" toolkit—providing pre-packaged, curriculum-aligned LATs (e.g., digital storytelling templates) that require minimal technical setup from the teacher.

Curriculum challenges with local wisdom

A third element that emerged from the interviews concerns curriculum implementation and indigenous knowledge. Educators indicated that numerous English-language websites and applications they see are predominantly centred on Western contexts, incorporating subjects, names, and scenarios from locales such as London or New York that seem remote from the experiences of pupils in Bangka Belitung. This discrepancy frequently diminishes student engagement, especially among lower-proficiency learners who already face challenges with language and background knowledge. Teachers stated that many English-language websites are overly focused on the West and lack sufficient "Bangka Belitung" cultural content to interest students.

"The internet has many English materials, but they are about London or New York. My students live in Bangka. They want to discuss our beaches and our food. Sometimes it is difficult for us to grasp the concepts of international understanding because our students are not yet internationalised, even though we hope they will be. But the point is that to imagine unknown cities to them indeed a little bit of a challenge." — Teacher T2

Teachers associated this issue with the requirements of Kurikulum Merdeka, which prioritises project-based evaluations and contextually pertinent themes. The new curriculum requires that students undertake initiatives concerning family, environment, and community; yet, they lack the necessary digital tools and templates to execute these duties systematically. This observation aligns with quantitative data indicating that 85% of students selected "Family" and 82% selected "Environment" as their preferred themes; nevertheless, the majority of their current learning activities remain predominantly textbook-based or worksheet-oriented. The new curriculum requires project-based examinations, but teachers lack the digital tools to implement them. This corresponds to the quantitative finding, in which 85% of students chose "Family" and 82% chose "Environment" as their favourite themes. Teachers verified that these are critical curriculum subjects, but they lack digital project templates. Certain educators recounted their improvisation by asking students to create posters or compose brief paragraphs about local beaches or traditional cuisine; however, they believed these activities could be significantly enhanced through the integration of digital storytelling tools, structured project outlines, and audiovisual stimuli that showcase Bangka Belitung environments and figures. The lack of such materials imposes a significant preparation load on instructors and restricts their ability to incorporate local knowledge into technology-enhanced lectures.

DISCUSSION

This mixed-methods study's findings strongly affirm the initial hypothesis that seventh-grade children in Bangka Belitung necessitate technology-enhanced English learning materials that are closely aligned with their linguistic requirements, learning preferences, and local environment. Quantitative results indicated that students demonstrate proficient performance in fundamental communicative functions (e.g., greetings and self-introduction), yet face significant challenges in morphosyntax and tense formation, especially in subject-verb agreement (58% accuracy) and simple past tense (55% accuracy). These trends support previous findings that Indonesian EFL learners frequently have difficulties with grammatical morphology owing to cross-linguistic discrepancies and insufficient explicit form-focused practice (Hamied, 2012; Susandi, 2023b). The exceptionally high levels of satisfaction (91%) and interest in English shown by students indicate that the primary concern is not motivation, but rather the discord between current instructional methods and learner requirements.

From a TPACK perspective, these findings indicate a disparity among content knowledge (CK), pedagogical knowledge (PK), and technology knowledge (TK), with technological-pedagogical integrations remaining insufficiently implemented in classroom practice (Harris, 2009; Harris & Hofer, 2011; Wu, 2013). Students exhibit a pronounced inclination towards websites (89%), videos (71%), and integrated audiovisual project activities (92%), reflecting the overarching trend towards technology-enhanced, advanced language acquisition as evidenced in English Learning Innovation, which includes the incorporation of data-driven learning and task-based language instruction to promote critical thinking (Erlangga et al., 2025; Setoningsih, 2023). Nevertheless, qualitative data indicated that these preferences have not yet been incorporated into daily training. Teacher interviews revealed a "infrastructure paradox": despite the school's possession of a computer lab and internet access, bureaucratic booking procedures, time limitations, and inconsistent connectivity render these resources nearly impractical for regular English instruction. This study corroborates earlier Indonesian studies indicating that the principal obstacle to ICT integration pertains more to access, policies, and practical limitations than to hardware scarcity (Cahyani & Cahyono, 2012; Manalu, 2019b; Rusydiyah et al., 2020).

The qualitative component also underscored a significant "confidence gap" in instructors' technology and technological-content understanding. Although educators conceptually supported TPACK-based instruction and recognised students' enthusiasm for multimedia-rich tasks, they regarded themselves as consumers rather than creators of digital materials, reflecting findings from narrative studies on TPACK implementation among English teachers documented in (Hermawis et al., 2025). This aligns with other Indonesian TPACK research that reports elevated pedagogical understanding yet diminished trust in the selection, adaptation, or creation of digital materials (Cheung & Jang, 2020b; Jamaludin et al., 2022; Taopan et al., 2024). This study reveals that teachers encountered difficulties in identifying digital resources that correspond to their students' grammatical deficiencies (e.g., past tense and subject-verb agreement) and align with Kurikulum Merdeka themes, supporting Mali's (Mali, 2024) assertion that technology integration should be grounded in explicit learning objectives and principled task design rather than incidental tool utilisation. The Learning Activity Types (LATs) framework serves as a pragmatic platform, offering structured classifications of activities that assist educators in designing technology-

enhanced tasks without necessitating advanced technical proficiency (Amelia et al., 2021; Harris & Hofer, 2015).

Contextual and cultural significance surfaced as another primary theme. Data from survey responses from students and teacher narratives highlighted the significance of themes such as family, environment, technology, friendships, and school life, all of which overlap with local identities and everyday experiences. Educators denounced the prevalence of Western-centric online resources and highlighted the motivational advantages of content rooted in Bangka Belitung's local wisdom, which corresponds with the focus on localised and culturally responsive English Language Teaching materials (Amelia et al., 2024; Handayani & Aprilliandari, 2022; Handayani & Kurnia, 2022). This study advances the existing research by demonstrating that junior high EFL learners in Bangka Belitung benefit from localised digital materials, highlighting the importance of localisation in the design of a TPACK-based website.

The overall results indicate that a meticulously designed TPACK-oriented LATs website could effectively address three interconnected deficiencies: enduring grammatical weaknesses despite elevated motivation, insufficient use of existing infrastructure stemming from logistical and confidence-related obstacles, and a lack of locally pertinent, curriculum-aligned digital activities. Consistent with Wilda's research on differentiated instruction combined with innovation (Toding et al., 2024), the proposed platform must provide adaptable, level-differentiated activity pathways (e.g., structured drills for lower-proficiency learners and project-based tasks for advanced students), all based on LAT categories and enhanced with multimodal, culturally relevant content. The findings emphasise that technological solutions alone are inadequate; continuous professional development in TPACK, institutional support to facilitate access to digital infrastructure, and persistent evaluation of classroom implementation are essential to transition from potential to enduring impact (Taopan et al., 2020; Usman et al., 2022).

CONCLUSION

This study demonstrates that a TPACK-based Learning Activity Types (LATs) website is not merely an optional innovation but an essential response to a structural misalignment among learner profiles, technical infrastructure, and instructional practices in Bangka Belitung. Quantitative findings indicate that seventh-grade students exhibit strong motivation and foundational communicative skills. Yet, they face ongoing challenges in morphosyntax—specifically in subject–verb agreement and the simple past tense—that are inadequately addressed by existing textbook-centred methodologies. Simultaneously, learners demonstrate a distinct preference for interactive, multimedia-enriched, and contextually relevant content, particularly on themes such as family and the environment, suggesting that their engagement potential is considerably underutilised. Qualitative data provide essential insight into the “Infrastructure Paradox”: despite schools claiming 100% access to computer labs and internet, bureaucratic booking processes, transition periods, and inconsistent connectivity render these resources impractical for daily instruction. Additionally, teachers’ “consumer mindset” and lack of confidence in creating technology-enhanced tasks hinder their ability to utilise the available tools effectively. The converging strands indicate three interconnected deficiencies: pedagogical

(inadequate scaffolded grammar support), technological-practical (underutilised infrastructure and absence of classroom-appropriate tools), and contextual-curricular (foreign resources misaligned with Kurikulum Merdeka and local realities)—which collectively hinder effective technology integration.

Given these deficiencies, the study contends that any effective digital intervention must transcend a mere store of resources and function as a teacher-enablement toolkit specifically designed for the restrictions and objectives stated in this context. The platform must be mobile-responsive and capable of offline functionality, allowing teachers and students to access activities through smartphones or classroom devices without dependence on lab-based, high-bandwidth settings, thus alleviating the Infrastructure Paradox and minimising connectivity-related concerns. The curriculum must be pre-populated with LATs aligned to educational standards that specifically address identified learner deficiencies—such as tense formation and subject-verb agreement—while integrating locally relevant themes such as family, environment, friendships, and school life, and providing tiered task variations to facilitate differentiated instruction in heterogeneous classrooms. Pre-designed templates for digital storytelling, project-based inquiry, and interactive grammar exercises can reduce preparation time, exemplify TPACK-informed design choices, and progressively transition educators from passive users to more assured, reflective technology integrators. The study recommends integrating website development with ongoing professional development and institutional support, and advocates for future design-based and implementation studies to assess the impact of a TPACK-based LATs website on student outcomes and the advancement of teachers' TPACK in actual classroom environments.

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CONFLICT OF INTERESTS

The authors declare that they have no conflict of interest.

AUTHOR(S) CONTRIBUTION

Amelia, P.: Conceptualization (lead), methodology (lead), writing–original draft (lead), review (supporting), research’s proposal lead. Handayani, R.: Conceptualization (supporting), methodology (supporting), writing –original draft (supporting), review (lead), editing (lead).

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