INTEGRATING SOCIO-CONSTRUCTIVISM AND DIGITAL LITERACY IN SPEAKING INSTRUCTION: LESSONS FROM NORTH SUMATERA

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ABSTRACT

This study examines the integration of socio-constructivist principles and digital literacy in English speaking instruction within higher education in North Sumatera, Indonesia. Despite growing emphasis on communicative competence, students continue to face challenges in oral proficiency, confidence, and access to authentic interaction, highlighting a gap in the effective integration of pedagogy and technology. This research aims to design, implement, and evaluate digitally supported instructional practices that enhance speaking competence through collaborative learning environments. A convergent mixed-methods design was employed, involving 120 English education students and 12 lecturers from three universities. Data were collected through questionnaires, classroom observations, speaking performance assessments, and semi-structured interviews, and analyzed using complementary statistical and thematic techniques. The findings indicate that digital storytelling, podcast-based tasks, and collaborative multimedia projects substantially improve learners' fluency, motivation, and self-efficacy. These outcomes reflect core socio-constructivist principles, particularly interaction, scaffolding, and learner autonomy. While lecturers demonstrated increasing digital pedagogical competence, challenges related to infrastructure and professional training remain evident. This study concludes that the integration of socio-constructivist approaches within digitally enriched learning environments promotes more communicative, multimodal, and culturally responsive speaking instruction. The proposed framework offers a sustainable model for advancing technology-integrated English language teaching in similar higher education contexts.

Keywords: Digital Pedagogy, Socio-Constructivism, Speaking.

INTRODUCTION

The landscape of English Language Teaching (ELT) is rapidly evolving in response to digital transformation and the increasing demand for communicative competence in the 21st century (Dörnyei, 2009). However, speaking remains one of

the most challenging skills for learners in higher education, particularly in contexts where teacher-centered practices still dominate. Instruction often prioritizes grammatical accuracy over interactive communication, limiting students' opportunities to engage in authentic, meaningful speaking activities and resulting in low confidence and reduced communicative readiness (Pereira Loor & Guevara Peñaranda, 2025) .

These challenges are evident in English education programs in North Sumatera, Indonesia, including institutions such as Universitas Muhammadiyah Sumatera Utara (UMSU), Universitas Negeri Medan (UNIMED), and STKIP Al Maksum. Despite institutional goals to prepare students for global communication, classroom practices frequently lack integration of technology and collaborative learning (Boadu & Boateng, 2024). Students commonly experience speaking anxiety and limited exposure to real-world communication tasks, while lecturers face constraints related to infrastructure, digital pedagogical competence, and curriculum alignment (Correia et al., 2025).

Although socio-constructivist theory emphasizes interaction, scaffolding, and learner-centered engagement, and digital literacy offers opportunities for multimodal and authentic communication, the integration of these approaches in speaking instruction remains limited and underexplored in this context (Salieva, Z. I. 2026). Existing studies tend to address either pedagogical theory or digital tools in isolation, leaving a gap in understanding how both can be systematically combined to enhance speaking competence (Zega, 2025).

Therefore, this study aims to design, implement, and evaluate an integrated instructional framework that combines socio-constructivist principles with digital literacy to improve students' speaking skills (Hartono, 2026). By situating the research within the North Sumatran higher education context, this study contributes a contextually grounded and pedagogically relevant model for developing communicative, collaborative, and technology-enhanced speaking instruction (Gan, 2025).

The significance of this study lies in its potential to contribute both to theory and practice in ELT (AZAHRA et al., 2025) . On the theoretical side, it explores how socio-constructivism and digital literacy frameworks can jointly inform speaking instruction, shifting the paradigm from traditional, form-focused teaching to more learner-centered, interactive, and multimodal approaches. Empirically, by

focusing on higher education institutions in North Sumatera, this study offers contextually grounded evidence about what works (and what doesn't) in a regionally representative Indonesian setting (Saragih & Muthia, 2026). The findings promise to inform policy makers, curriculum designers, teacher education programs, and institutional administrators by highlighting systemic supports needed, pedagogical strategies that succeed, and barriers that must be addressed (Singun, 2025).

The objectives of this study are as follows:

a. To examine how socio-constructivist theories and digital literacy underpin current speaking instruction practices in select higher education institutions in North Sumatera.
b. To identify digital pedagogical strategies (e.g., digital storytelling, multimodal tasks, online collaboration platforms, context-based speaking tasks) that are most effective in improving linguistic, communicative, and affective aspects of speaking (fluency, confidence, creative expression).
c. To analyze key challenges in integrating socio-constructivist, digitally literate speaking instruction, particularly focusing on teacher readiness, infrastructural and access issues, and sustainability of digital integration.
d. To propose a practical, theoretically grounded framework for embedding socio-constructivism and digital literacy into speaking instruction in contexts similar to North Sumatera.

The theoretical foundations of this study draw primarily on socio-constructivism, digital literacy, and multiliteracy. Socio-constructivism, following the work of Vygotsky, emphasizes that learning, including language learning, occurs as individuals interact with more knowledgeable others, engage in collaborative activity, and scaffold new knowledge in socially meaningful contexts. In speaking instruction, this means tasks that require peer interaction, dialogue, negotiation of meaning, and scaffolding (both from peers and instructors) are central. Digital literacy theory, meanwhile, encompasses the skills, practices, and dispositions needed for learners to access, evaluate, produce, and interact with digital media and digital content. As digital

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communication becomes pervasive, digital literacy becomes integral not just for reading and writing but also for speaking—in video calls, podcasts, online discussions, etc. Multiliteracy adds another dimension, emphasizing multiple modes of communication (textual, visual, audio, gestural, digital) and encouraging learners to draw on a variety of semiotic resources (e.g., images, video, multimodal tasks) to construct meaning. Together, these theories provide the lens through which this study views speaking instruction not just as pronunciation + grammar, but as a richly mediated, interactive, socially situated, and multimodal practice. Recent related studies offer patterns that this research builds upon and extends. For example, Incorporating Multiliteracy Pedagogy Elements into EFL Speaking Class Through Digital Storytelling (Dewi, Hartono, Saleh, & Wahyuni, 2023) showed that digital storytelling allows learners to practice speaking in authentic contexts, conceptualize and analyze story content, and receive meaningful feedback, representing the four knowledge processes of multiliteracy (situated practice, overt instruction, critical framing, transformed practice). Similarly, Perceived Benefits of Digital Storytelling for Speaking Development Among Motivated Indonesian EFL Learners (Sulistianingsih, Fitriati, & Mujiyanto, 2023) found that digital storytelling improved learners' speaking fluency, idea formulation, and confidence in a private university setting.

Studies focused on teacher side have also revealed gaps: EFL Teacher's Strategies and Challenges in Developing Digital Competency: A Narrative Inquiry Mark Feng Teng (2025) highlighted that while teachers generally recognize the importance of digital tools and are willing to integrate them, many struggle with lack of training, institutional support, and knowledge of how to align technology with pedagogy rather than simply using tools. In another study, Teacher Readiness for Online Teaching Using Mobile Technology Serika & Mane (2025) reported that many English and non-English teachers in several secondary schools perceived their readiness to be moderate and identified technical, pedagogical, and attitudinal barriers toward mobile-based online instruction (Mudra, 2025).

Even more broadly, Digital Literacy in EFL Learning: University Students' Perspectives (Li, 2025) explored how students themselves perceive their digital literacy and found that their ability to use digital tools, search for authentic materials, interact online, etc., affects their

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language learning positively when such tools are well scaffolded in class. Another recent work, Investigating Multiliteracy Pedagogy Practices of EFL-Speaking Teachers in Indonesia (Dewi et al., 2025) explored how higher education EFL speaking teachers implement multiliteracy pedagogy; the study revealed that while many teachers use visual, audio and audiovisual modes in speaking classes, there remains inconsistency in integrating critical framing and transformed practice components (Osman et al., 2022). However, few of these studies focus specifically on the empirical classroom practices in the North Sumatera region, combining both student and educator perspectives, nor do they propose a framework grounded in socio-constructivism + digital literacy + multiliteracy tailored to local constraints (access, infrastructure, digital divide). Also, many studies are cross-sectional or pilot, with limited attention to long-term sustainability or institutional policy implications (Khan et al., 2025).

The novelty of the present study is therefore multi-fold: first, it focuses specifically on North Sumatera institutions, contributing regionally specific data in a part of Indonesia underrepresented in ELT research on digital pedagogy. Second, it combines literature-based inquiry with empirical data (classroom observations, interviews, questionnaires) to triangulate perspectives from both lecturers and students. Third, it emphasizes the integration of socio-constructivism + digital literacy + multiliteracy as a combined conceptual frame for speaking instruction, rather than treating each in isolation. Fourth, the study addresses not only pedagogical strategies but also institutional, infrastructural, and sustainability issues which are vital for real gains in practice.

The contribution of this study is expected to be significant at several levels. Practically, it will offer a context-sensitive framework and set of recommendations for lecturers and curriculum designers in North Sumatera (and similar Indonesian or Southeast Asian settings) to redesign speaking instruction in more interactive, multimodal, learner-centered ways. It will provide evidence about which digital strategies are perceived as effective by both learners and educators, and clarify what supports (technical, institutional, professional development) are needed. Theoretically, the study will enrich ELT theory by demonstrating how socio-constructivism, digital literacy, and multiliteracy interact in speaking pedagogy in a non-Western, resource-constrained higher education context. It

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may also help refine operational definitions of digital literacy in speaking-oriented tasks, and contribute to multiliteracy scholarship in ELT. The study's empirical findings about teacher readiness, infrastructure constraints, and sustainability will help fill a gap in ELT research, particularly in Indonesia, where much of the existing literature focuses on tools or anecdotal successes, less on systematic frameworks grounded in theory and local institutional realities.

The implications of the present study are both pedagogical and policy-oriented. From a pedagogical standpoint, English lecturers in North Sumatera and beyond should consider redesigning their speaking tasks to include multimodal and digital elements: e.g., digital storytelling, peer collaboration via online platforms, context-based speaking (role-plays, simulated real-life tasks), interactive multimedia; these tasks facilitate not just language fluency but motivation, creativity, confidence, and learner autonomy. Teacher education programs and professional development must include more than technical training: they must build pedagogical digital literacy, capacity for socio-constructivist scaffolding, and multiliteracy awareness. At the policy level, institutional leadership (in universities, departments of education) must invest in reliable infrastructure (connectivity, hardware, access), develop policies incentive for digital innovation, support sustained integration rather than one-off projects, and design curricula that embed digital speaking competencies. The study also suggests that further research should consider longitudinal designs to investigate sustainability over time, explore cross cultural comparisons, and examine emerging technologies (AI, VR, etc.) as potential enhancers of speaking instruction.

In summary, this study sets out to explore how integrating socio-constructivism and digital literacy in speaking instruction can address persistent problems in ELT in North Sumatera, offering both theoretical insights and practical guidance, filling gaps in current literature, and aiming toward more equitable, interactive, and effective speaking pedagogy geared for the digital age.

REVIEW OF RELATED LITERATURES

Socio-constructivism continues to inform contemporary research in English language teaching, particularly in promoting interactive and learner-centered

speaking instruction. Recent empirical studies (2020–2025) consistently demonstrate that collaborative and scaffolded learning environments enhance speaking performance. For example, Susanti (2025) found that group-based communicative tasks significantly improved EFL learners' fluency and confidence in Indonesian higher education contexts. Similarly, Hassan et al. (2021) reported that structured peer interaction and guided speaking activities increased students' self-efficacy and reduced speaking anxiety. More recent findings by Rokhayati et al. (2025) indicate that collaborative problem-based speaking tasks promote not only fluency but also critical thinking and negotiation of meaning. Across these studies, a clear pattern emerges: socio-constructivist speaking practices—characterized by interaction, scaffolding, and shared meaning-making—consistently lead to improved communicative competence and learner engagement.

At the same time, research on digital literacy has expanded rapidly, highlighting its role in transforming speaking instruction through technology-mediated communication. Studies between 2020 and 2025 show that digital tools provide learners with more authentic, flexible, and multimodal speaking opportunities. For instance, Hockly (2020) demonstrated that video-based tasks and online speaking platforms enhance learner autonomy and motivation. Likewise, Rahmawati (2022) found that podcast-based assignments significantly improved students' speaking fluency and reflective learning. In addition, Putri et al. (2024) reported that multimedia presentations and asynchronous speaking tasks enable learners to rehearse, evaluate, and refine their oral performance over time. These findings suggest that digital literacy not only expands access to speaking practice but also supports continuous improvement through multimodal and self-paced learning environments.

2.1 The Relation between Theory and Digital Pedagogy

Recent studies increasingly integrate socio-constructivism and digital literacy within the framework of multiliteracies, emphasizing the importance of multimodal communication in language learning. Building on the work of The New London Group, contemporary research highlights how learners construct meaning across linguistic, visual, and digital modes.

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Empirical evidence supports this integration. For example, Kessler (2022) found that digital storytelling projects foster collaboration and significantly enhance speaking fluency and creativity. Similarly, Hafner (2021) demonstrated that video-based assignments improve learners' multimodal communicative competence and audience awareness. A more recent study by Wijaya (2024) revealed that integrating collaborative digital projects with socio-constructivist strategies leads to higher student engagement and more meaningful speaking interactions.

However, despite these advancements, most existing studies still examine socio-constructivist pedagogy and digital literacy separately or focus on isolated instructional tools. There is limited research that systematically integrates both perspectives into a comprehensive instructional framework for speaking development, particularly in higher education contexts in Indonesia. This gap underscores the need for research that combines collaborative learning principles with digital literacy practices to create more effective, contextually relevant, and sustainable models of speaking instruction.

2.2 Recent Studies

Recent empirical studies in English as a Foreign Language contexts provide strong support for the effectiveness of integrating digital tools with socio constructivist pedagogies. Digital storytelling, for example, has been widely recognized as an effective strategy for developing speaking skills because it combines narrative construction, personal expression, and multimedia production. Learners who engage in digital storytelling activities tend to demonstrate improvements in fluency, coherence, and confidence, as well as increased motivation to participate in speaking tasks. Similarly, podcast based assignments and collaborative multimedia projects have been shown to foster learner autonomy, peer interaction, and authentic language use. These findings indicate that digital pedagogy, when aligned with socio constructivist principles, can create meaningful and engaging speaking experiences.

However, the implementation of digitally mediated and socio constructivist speaking instruction is not without challenges. A growing body of literature highlights issues related to teacher readiness, technological infrastructure,

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and institutional support. Many educators report limited training in integrating digital tools in pedagogically meaningful ways. In addition, unequal access to reliable internet connectivity and digital devices may restrict students' participation in technology enhanced learning activities. These challenges point to the need for comprehensive professional development programs and supportive institutional policies to ensure sustainable integration of digital pedagogy in language classrooms.

Despite the increasing number of studies on digital pedagogy and socio constructivism, there remains a gap in research that examines their integrated application within specific regional contexts, particularly in North Sumatera, Indonesia. Much of the existing literature focuses on isolated interventions or generalized findings, with limited attention to contextual factors such as local educational practices, resource availability, and institutional constraints. Therefore, a context sensitive investigation that combines theoretical perspectives with empirical classroom practices is necessary to provide a more comprehensive understanding of effective speaking instruction.

In response to these gaps, the present study seeks to extend the existing body of knowledge by examining the integration of socio constructivism, digital literacy, and multiliteracies in higher education contexts in North Sumatera. By incorporating perspectives from both students and lecturers, this study aims to identify effective digital pedagogical strategies, analyze existing challenges, and propose a sustainable framework for speaking instruction. The findings are expected to contribute to both theoretical development and practical implementation in English language teaching, particularly in contexts characterized by limited resources and diverse cultural backgrounds.

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METHODS

This study adopts a convergent mixed-methods design integrating two complementary components: (1) a systematic literature review of studies published between 2019 and 2024, and (2) an empirical classroom investigation conducted at three higher education institutions in North Sumatera—

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Universitas Muhammadiyah Sumatera Utara (UMSU), Universitas Negeri Medan (UNIMED), and STKIP Al Maksum. The design enables a comprehensive examination of how socio-constructivist approaches and digital literacy intersect in speaking instruction.

Data were collected concurrently using both quantitative and qualitative techniques. Quantitative data included questionnaires and pre- and post-speaking performance assessments, while qualitative data were obtained through semi-structured interviews, classroom observations, and student-produced artifacts (e.g., digital storytelling projects and podcasts). All instruments were developed to capture key constructs of interaction, scaffolding, learner autonomy, and digital engagement.

Data analysis was conducted separately for each strand using appropriate statistical and thematic procedures, followed by an integrative phase to generate meta-inferences. This approach allows for triangulation across data sources and strengthens the validity of findings by linking empirical classroom practices with broader evidence from the literature..

3.1 Sites & population

a. Sites (purposive): Universitas Muhammadiyah Sumatera Utara (UMSU), Universitas Negeri Medan (UNIMED), STKIP Al Maksum chosen because they represent diverse program types and documented needs in speaking instruction in North Sumatera.
b. Population: Undergraduate students enrolled in English Education / Tadris English programs and lecturers who teach speaking courses in the selected institutions.

3.2 Sampling Technique

This study employed a multi-stage purposive and stratified sampling technique to ensure the inclusion of representative participants from different institutional contexts and speaking proficiency levels across North Sumatera. The combination of purposive and stratified strategies was chosen to capture rich and contextually grounded data while maintaining analytical comparability among subgroups

a. Stage 1 Site Selection (Purposive Sampling)

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In the first stage, three tertiary institutions were selected purposively: Universitas Muhammadiyah Sumatera Utara (UMSU), Universitas Negeri Medan (UNIMED), and STKIP Al Maksum. These institutions were deliberately chosen to represent diverse institutional profiles in North Sumatera—one large private university, one state university, and one teacher training college. Each offers English Education programs with established speaking courses and varying degrees of digital integration. This purposive site selection enabled the study to capture inter-institutional differences in pedagogical practices, technological access, and learner backgrounds.

The inclusion criteria for the institutions were:

1. Availability of undergraduate English Education programs.
2. Active implementation of at least one speaking course at the time of data collection.
3. Institutional willingness to provide access for classroom observations and participant recruitment.

By focusing on these three diverse institutional types, the study aimed to increase the ecological validity of findings and allow for cross-contextual comparisons in the adoption of digital pedagogy and socio-constructivist approaches to speaking instruction.

b. Stage 2 Participant Stratification (Purposive + Stratified Sampling)

The second stage involved stratified selection of participants within each institution. Two major participant groups were included—students and lecturers—each representing distinct but complementary perspectives in the teaching–learning ecosystem.

a) Student Participants.

Student participants were stratified based on year level or course level (first-year and third-year students) to capture variations in language proficiency, digital literacy exposure, and familiarity with speaking pedagogy. First-year students represent those who are still developing foundational speaking competence and digital learning habits, whereas third-year students typically possess higher linguistic maturity and may have prior experience with digital projects or blended learning.

A total of approximately 120 students (around 40 per institution) were targeted, providing a balanced representation across sites and sufficient

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statistical power for descriptive and inferential analyses. This sample size aligns with recommendations for small-to-medium effect sizes in educational research, as indicated by power analysis using G*Power (Faul et al., 2009), where an effect size of f = 0.25, α = 0.05, and power = 0.80 suggests a minimum of 102 participants for one-way ANOVA comparisons. Expanding to 120 students allows for potential attrition while ensuring robust results.

Students were recruited voluntarily through departmental announcements and class briefings by course lecturers. Inclusion criteria were:

a. enrolled in a speaking course (Speaking I, II, or III).
b. Willingness to participate in questionnaires, classroom observations, and digital task submissions.
c. Consent to be audio/video recorded for speaking assessments.

b) Lecturers

Lecturers were selected purposively, focusing on those currently teaching speaking courses or recently integrating digital tools in instruction. To ensure variation in pedagogical experience and digital engagement, both experienced and novice lecturers were included. This enabled the study to explore differing instructional philosophies, levels of digital competence, and perceived barriers to digital pedagogy adoption.

A total of 9–15 lecturers (3–5 from each institution) constituted the lecturer sample. This range allows adequate representation for cross-institutional comparison while keeping the qualitative data manageable for in-depth thematic analysis.

c) Interview Subsamples.

A purposive subsample of approximately 20–30 students (6–10 from each institution) was drawn from the main participant pool for semi-structured interviews. Selection considered gender balance, proficiency level, and willingness to articulate experiences with digital and socio-constructivist learning.

All participating lecturers (9–15) were also interviewed to obtain triangulated qualitative insights regarding instructional design, scaffolding strategies, and perceived affordances of digital storytelling, podcasting, and other digital tools.

d. Rationale for Sampling Strategy

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The combination of purposive and stratified techniques ensured the inclusion of participants who were both informationally rich and representative of key subgroups in the research context (Patton, 2015). Stratification by institution and learner level minimized potential bias and enhanced the generalizability of findings within the province's English education context. Purposive sampling of lecturers and interviewees supported the mixed-methods design's qualitative strand by enabling maximum variation sampling, capturing diverse pedagogical voices and lived experiences (Miles, Huberman, & Saldaña, 2020). This dual approach balanced the need for breadth (quantitative representativeness) and depth (qualitative insight), aligning with the study's convergent mixed-methods framework.

e. Ethical and Logistical Considerations

All participants received detailed information sheets and informed consent forms before participation. Recruitment was coordinated through official institutional channels to ensure transparency and compliance with ethical protocols. Each participant was assigned a unique pseudonym code to protect confidentiality during data analysis and reporting. Participation was strictly voluntary, and students were assured that their academic standing would not be affected by their decision to participate or withdraw.

3.3 Instrumentation and Instrument Development

To obtain comprehensive, triangulated data that captured both quantitative trends and qualitative depth, this study employed multiple research instruments developed and validated through a systematic, multi-phase process. The instruments were designed to measure learners' digital literacy, speaking self-efficacy, and perceptions of digital pedagogy, while also documenting lecturers' pedagogical practices, classroom interactions, and digital tool integration. Qualitative instruments were developed to elicit rich experiential data and authentic evidence of teaching–learning dynamics consistent with the socio-constructivist and digital literacy frameworks underpinning the research.

3.4 Instruments and Their Purposes

Six primary instruments were developed and utilized:

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a. Student Questionnaire – to collect data on demographic information, digital literacy self-assessment, speaking self-efficacy, attitudes toward digital pedagogy, and frequency of digital tool use. The questionnaire used a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree) for scale-based items, complemented by categorical and open-ended questions.
b. Lecturer Questionnaire – to assess lecturers' digital competence, pedagogical beliefs, teaching practices, perceived institutional support, and barriers to technology adoption.
c. Semi-Structured Interview Guides – separate guides were designed for students and lecturers to explore deeper insights into experiences, perceptions, and challenges in implementing socio-constructivist, digitally mediated speaking instruction.
d. Classroom Observation Protocol / Checklist – to record empirical evidence of socio-constructivist teaching behaviors (peer interaction, scaffolding, feedback), digital integration (use of multimedia, collaboration tools), and task authenticity (real-world simulation, multimodal engagement).
e. Speaking Performance Task and Analytic Rubric – standardized speaking tasks (storytelling, role-play, or podcast production) were used to assess learners' speaking competence objectively. The rubric, adapted from the Common European Framework of Reference (CEFR) and validated ELT rubrics (Brown, 2015; Derakhshan et al., 2022), included five criteria: fluency and coherence, lexical resource, grammatical accuracy, pronunciation and intelligibility, and interactional competence.
f. Artifact Collection Template – used to organize and evaluate student-created digital products such as videos, podcasts, and digital stories, which served as qualitative evidence of speaking performance and multimodal literacy.

This multi-instrument approach ensured both methodological triangulation and data validity by combining self-

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reports, performance-based measures, and observational data (Dörnyei, 2020; Creswell & Plano Clark, 2018).

3.5 Instruments Development Procedures

The process of instrument development followed five systematic stages consistent with best practices in educational measurement (Fitriani et al., 2025)

a. Stage 1 – Construct Definition and Item Generation

Each instrument's constructs were derived from theoretical and empirical foundations.

1. For the student questionnaire, constructs were informed by the European Digital Competence Framework self-efficacy theory, alongside indicators from speaking anxiety and motivation scales
2. The lecturer questionnaire incorporated dimensions from Technological Pedagogical Content Knowledge (TPACK) (Mishra & Koehler, 2006) and the Technological Readiness Index
3. Interview guides and observation checklists were grounded in socio-constructivist theory and the multiliteracies, emphasizing interaction, collaboration, and multimodal meaning-making.

Items were initially drafted in English to maintain construct precision, then translated into Bahasa Indonesia to ensure accessibility for all participants. Back-translation was used to maintain semantic equivalence.

b. Stage 2 – Face and Content Validity

To establish face validity, the draft instruments were reviewed by a panel of five experts in English language teaching, educational measurement, and digital pedagogy. The reviewers evaluated each item for clarity, relevance, and alignment with research objectives. For content validity, each expert rated the relevance of items on a 4-point scale (1 = Not Relevant, 4 = Highly Relevant). The Item-level Content Validity Index (I-CVI) and Scale-level Content Validity Index/Average (S-CVI/Ave) were computed following Polit and Beck's (2006) procedure. Items with I-CVI values below 0.78 were revised or removed. The final S-CVI/Ave values exceeded 0.90 for all instruments, confirming high content validity.

c. Stage 3 – Pilot Testing

Pilot testing was conducted with a small group of 30 students and 5 lecturers from one non-participating institution with similar characteristics. The pilot aimed to assess item clarity, response time, and initial reliability. Feedback indicated that minor linguistic adjustments were needed for certain items to ensure contextual relevance. The pilot also validated the functionality of the digital delivery format (Google Forms) and the usability of the observation checklist during live classroom sessions.

d. Stage 4 – Reliability and Construct Validation

Reliability analysis was conducted using Cronbach's Alpha and item-total correlations. The student questionnaire achieved internal consistency coefficients ranging from $\alpha = 0.81$ to $\alpha = 0.89$ across subscales (digital literacy, speaking self-efficacy, digital pedagogy attitudes). The lecturer questionnaire achieved $\alpha = 0.84$, indicating high reliability. Construct validity was assessed through exploratory factor analysis (EFA) using principal component extraction and Varimax rotation. Factor loadings above 0.50 were retained, confirming alignment between observed variables and theoretical constructs. The final instruments showed clear factor structures consistent with their respective conceptual models.

e. Stage 5 – Finalization and Administration Preparation

All instruments were finalized following validation and reliability procedures. Administration guidelines were prepared, detailing standardized instructions, informed consent protocols, and contingency procedures for online or paper-based delivery.

1. The questionnaires were formatted in Google Forms with logical skip patterns and anonymity options.
2. The interview guides were organized by theme (digital learning experiences, challenges, cultural relevance, and socio-constructivist interaction).
3. The observation protocol included both a checklist of observable indicators and open comment sections for qualitative field notes.
4. The speaking rubric was formatted in a 4-point analytic scale, accompanied by a rater training manual to ensure scoring consistency across evaluators.

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RESULTS AND DISCUSSION

The findings indicate that students who participated in digital storytelling and video-based speaking tasks demonstrated measurable improvement in both fluency and confidence. Quantitative analysis of pre- and post-speaking scores shows a consistent increase in performance, particularly in fluency, pronunciation, and coherence. In addition, questionnaire results reveal that a majority of students reported higher levels of confidence when engaging in technology-mediated speaking activities. The improvement in students' fluency and confidence supports previous findings on the effectiveness of digital storytelling in enhancing oral communication. The ability to rehearse and reflect on recorded performances appears to play a crucial role in facilitating language development, an affordance that is often limited in traditional classrooms. This finding aligns with Lev Vygotsky's concept of the Zone of Proximal Development, where learning progresses through guided practice and self-regulation.

Moreover, the role of peer interaction and collaborative learning confirms earlier research highlighting the importance of interactional scaffolding in developing communicative competence. The findings suggest that speaking development is not solely the result of individual practice but is significantly enhanced through socially mediated and digitally supported engagement.

In terms of motivation, the results corroborate studies which emphasize the motivational impact of technology-mediated learning. The integration of multimedia and creative tasks provides learners with authentic communicative purposes, bridging formal instruction with real-world digital practices. This supports the notion of "authentic digital contexts" ,where learners engage in meaningful and contextually relevant language use.

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From a socio-constructivist perspective, increased motivation can be attributed to learners' active participation in collaborative meaning-making processes. Students are positioned not merely as recipients of knowledge but as contributors within a learning community. This finding is consistent with Zoltán Dörnyei's framework, which highlights the importance of autonomy, relatedness, and competence in sustaining learner engagement.

Table 1. Speaking Rubric

No	Criterion	1 (Limited)	2 (Developing)	3 (Proficient)	4 (Advanced)	Criterion	1 (Limited)
1	Fluency & Coherence	Frequent pauses, fragmented	Moderate pauses, uneven flow	Generally fluent	Smooth, natural flow	Fluency & Coherence	Frequent pauses, fragmented
2	Lexical Resource	Limited range, repetitive	Adequate range, occasional misuse	Good range, mostly appropriate	Wide range, precise use	Lexical Resource	Limited range, repetitive
3	Grammar	Frequent errors impede meaning	Some errors, partial control	Generally accurate	High accuracy, complex forms	Grammar	Frequent errors impede meaning
4	Pronunciation	Often unclear	Understandable, some interference	Clear, natural rhythm	Native-like clarity	Pronunciation	Often unclear
5	Interactional Competence	Minimal response	Partial engagement	Cooperative turn-taking	Initiates and sustains interaction	Interactional Competence	Minimal response

The findings of this study provide a comprehensive understanding of how socio-constructivist and digital literacy principles can be effectively integrated into English speaking instruction within higher education contexts in North Sumatera. Data collected from 112 English education students and 12 lecturers across three institutions—Universitas Muhammadiyah Sumatera Utara (UMSU), Universitas Negeri Medan (UNIMED), and STKIP Al

Maksum—reveal that digital pedagogy implementation substantially improves learners' speaking performance, engagement, and motivation. Quantitative data from pre- and post-intervention surveys demonstrate measurable improvement in students' self-perceived fluency, confidence, and communicative competence, while qualitative data from interviews and classroom observations highlight increased learner collaboration, creativity, and critical reflection. These results validate the proposition that a socio-constructivist approach, when supported by digital literacy practices, creates a transformative learning environment that fosters authentic communication and 21st-century competencies. Students who participated in digital storytelling and video-based speaking tasks reported significant improvement in fluency and confidence. The findings align with previous studies emphasizing the role of digital storytelling in promoting oral expression and reducing anxiety Learners expressed that using mobile-assisted tools and multimedia platforms allowed them to rehearse, record, and evaluate their performance repeatedly—an affordance rarely available in conventional classrooms. This iterative practice supports Vygotsky's (1978) concept of the Zone of Proximal Development (ZPD), wherein learners progress through guided participation and self-reflection. Similarly, socio-constructivist interaction through peer feedback and collaborative online discussion provided authentic communicative contexts, confirming earlier evidence that interactional scaffolding facilitates fluency and pragmatic competence The results underscore that fluency in speaking emerges not only from linguistic practice but also from socio-digital engagement that encourages autonomy and self-efficacy.

CONCLUSIONS

This study shows that integrating socio-constructivist principles with digital literacy can effectively support the development of students' speaking skills in higher education contexts in North Sumatera. Evidence from improved speaking performance scores, increased learner participation, and positive student perceptions indicates gains in fluency, confidence, and motivation. The use of digital storytelling, multimedia tasks, and collaborative activities also promotes

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learner autonomy and meaningful interaction, aligning with the goals of communicative language teaching.

However, these outcomes should be interpreted alongside several limitations. Variations in digital access, differing levels of lecturer readiness, and the relatively limited scope of institutional contexts may affect the generalizability of the findings. These constraints highlight the importance of providing adequate training and infrastructural support when implementing digital pedagogy.

Despite these challenges, the study contributes by proposing a contextually grounded model of socio-digital speaking instruction that can inform classroom practice and curriculum development. Future research is recommended to test the scalability of this model across broader educational settings and to examine its long-term impact on learners' communicative competence.

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