

Indonesian Teachers' Perceptions About the Potential of Technology-Enhanced Language Assessment (TELA)

Muhammad Haikal^{1*} , Cristina A. Huertas-Abril² ,
Francisco Javier Palacios-Hidalgo³ 

Abstract

Technology-enhanced language assessment (TELA) has significantly improved language evaluation by integrating digital tools to enhance accuracy, efficiency, and accessibility. This study aims to investigate the role of TELA in language assessment, particularly its advantages, challenges, and implications for pre-service teachers and learners. A mixed-method design was employed, combining closed-ended and open-ended questionnaire responses to provide both quantitative and qualitative insights. The findings reveal key trends in TELA, including the use of artificial intelligence, automated scoring systems, and adaptive testing. While TELA facilitates personalized and immediate feedback, concerns regarding digital equity, validity, and ethical considerations remain significant. This study concludes that a balanced approach is necessary for the effective implementation of TELA to ensure pedagogical effectiveness and ethical soundness. Future research should explore strategies to mitigate the challenges associated with digital assessments in language learning.

Keywords: artificial intelligence, digital tools, language assessment, learning technology, language technology-enhanced language assessment (TELA)

¹ Corresponding Author: PhD Candidate of the Programme "Languages and Cultures" of Universidad de Córdoba, Spain, & Lecturer at the English Language Teaching, Universitas Darussalam Gontor, Ponorogo, Indonesia; ORCID ID: <https://orcid.org/0000-0002-4340-3315>;

Email: muhammad.haikal@unida.gontor.ac.id

² Full professor, Department of English and German Studies, University of Córdoba, Córdoba, Spain; ORCID ID: <https://orcid.org/0000-0002-9057-5224>

³ Associate Professor, Department of English and German Studies, University of Córdoba, Córdoba, Spain; ORCID ID: <https://orcid.org/0000-0002-4326-209X>

1. Introduction

Assessment is a key aspect in measuring learning success, as it aims to identify learners' needs, monitor progress, and evaluate the effectiveness of teachers in performing their roles (Elmore, 2019). In the language teaching and learning context, assessment serves various purposes, including determining learners' language proficiency levels, allowing for individualized instruction, setting learning goals, ensuring teaching quality, providing feedback, and motivating learners (Theall & Franklin, 2010). According to Giraldo et al. (2023), the field of language assessment has increasingly emphasized the development of teachers' Language Assessment Literacy (LAL), recognizing its significant role in supporting effective classroom practices, as shown by empirical research (Firoozi et al., 2019; Lan & Fan, 2019; Ölmezer-Öztürk & Aydın, 2019; Tsağari & Vogt, 2017; Vogt et al., 2020).

As a result, LAL served as a fundamental aspect of the teaching profession, especially in the field of language education (Kremmel & Harding, 2020). Strong evidence shows that assessment literacy can enhance students' learning and academic performance (Davari Torshizi & Bahraman, 2019; Denton & McIlroy, 2018). Educators have shown a strong desire to acquire knowledge about assessment, particularly from a practical standpoint (Djoub, 2017; Zulaiha et al., 2020). This emphasis is mainly on the skills aspect of LAL, which can be developed through teacher training and professional development programs (Giraldo, 2021).

Concerning technology, its integration into education has attracted significant attention, impacting language instruction. Traditional language assessment methods have shifted to technology-assisted approaches, reflecting a growing interest in modernizing classroom practices (Derakhshan & Zhang, 2024; Qi & Derakhshan, 2025). The range of technology tools designed to aid teachers in meaningful assessment has expanded considerably. However, the incorporation of technology into assessment, or so-called technology-enhanced assessment, remains complex, influenced by individual, contextual, and technical factors (Derakhshan et al., 2026). Additionally, the emergence of Artificial Intelligence (AI) has made a notable impact, especially in education. AI's capacity to simplify and personalize language curricula and educational materials has enhanced teaching practices. Systems like ChatGPT streamline time-consuming aspects of teaching, providing timely and valuable feedback to students (Derakhshan et al., 2026). ChatGPT and similar technologies are poised to offer substantial support to teachers in addressing students' diverse needs (Derakhshan et al., 2026).

Considering the above, this study will investigate the perceptions of pre-service teachers regarding language assessment, including their experiences with Technology-Enhanced Language Assessment (TELA) in language teaching and learning. By contextualizing TELA, this study also seeks to contribute to the understanding of effective assessment practices in the language learning process, particularly in relation to the use of technology, which is fundamentally distinct from traditional assessment methods.

In the Indonesian context, however, several challenges remain, especially in conducting assessments with the assistance of technology. According to Festiyed et al. (2022), teachers face difficulties in designing synchronized learning instructions, including content, methods, assessment, and e-learning tools. Similarly, Hafizuddin Mohamed Jamrus et al. (2024) revealed issues during evaluation implementation, such as a lack of assessment materials and a limited understanding of application usage. On a positive note, Yang (2023) found that EFL teachers expressed positive attitudes toward the use of technology for formative assessment in higher education. However, there remains a gap in studies focusing on the application of technology in language assessment in Indonesia, suggesting that there must be further research to address these challenges and enhance assessment practices.

Research Question(s)

Based on the aforementioned research, and to the best of the researchers' knowledge, there is still a gap in studies focusing on the application of technology in language assessment in the Indonesian context. Therefore, this study aims to investigate the attitudes of Indonesian pre-service EFL teachers regarding the use of technology in their teaching, particularly in language assessment practices. To this end, the following research questions (RQs) are proposed:

1. Research Question 1 (RQ1). How do Indonesian pre-service EFL teachers perceive the effectiveness of TELA in terms of assessing students' language proficiency?
2. Research Question 2 (RQ2). What are the potential advantages and limitations of TELA, and how do Indonesian pre-service EFL teachers perceive these practices in comparison to traditional assessment methods?

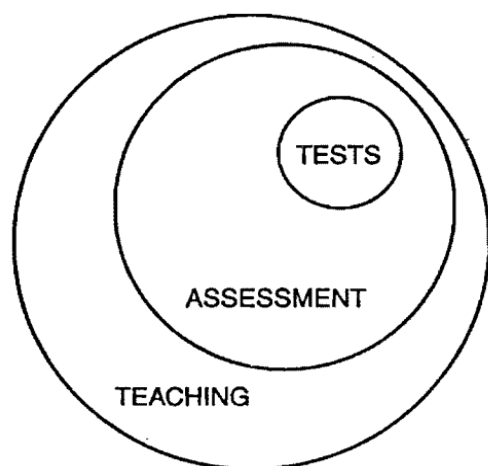
2. Literature Review

2.1. Understanding the Relationship Between Teaching, Assessment, and Testing

Understanding the hierarchical relationship between teaching, assessment, and testing is essential for effective language instruction (Pandey, 2024). Teaching represents the broadest domain, encompassing assessment, within which testing functions as a specific, formalized subset (Hamre et al., 2013). While all tests are assessments, not all assessments are tests; both, however, serve the overarching goals of teaching and learning (Barnes et al., 2017). As can be seen in Figure 1, effective language education therefore requires teachers to master diverse assessment practices—not only administering tests but also providing formative feedback, adapting instruction, and evaluating learning through observations, portfolios, and self-assessment (Giraldo & Yan, 2025; Estaji, 2024; Weng & Shen, 2022).

Figure 1

Relationship Diagram of Tests, Assessment, and Teaching (Brown, 2004, p. 5).



The integration of teaching and assessment, often referred to as alignment, promotes coherence among curriculum, instruction, standards, and assessment, thereby supporting high-quality learning outcomes (Bajarias et al., 2024; Yang, 2022; Zhao et al., 2023). With the increasing role of technology, teachers must develop strong assessment literacy to design, interpret, and apply both traditional and alternative methods effectively, ensuring that assessment enhances student learning rather than merely measuring it (Abdullaeva et al., 2024; Al-Bahlani & Ecke, 2023).

Nonetheless, some scholars argue that this traditional framework, while useful for explaining the basic concepts, is not fully relevant in the digital era. With the emergence of TELA, assessment can take place simultaneously with instruction—for instance, through real-time feedback via applications, gamified assessment, or AI-based feedback. This perspective provides the basis for viewing TELA both as a continuation of and a departure from conventional assessment practices (Bearman et al., 2022; Harden & Lilley, 2024; Nieminen et al., 2023).

2.2. Teachers' Role in Language Assessment

The role of teachers in language assessment carries particular significance. However, limited research has addressed this, with some studies encouraging teachers to adopt more critical stances toward assessment practices (Fan et al., 2020). Research has shown that teacher participation across all phases of assessment can improve test validity and effectiveness, and as key stakeholders with deep knowledge of students and curricula, teachers also offer invaluable feedback to assessment developers (So, 2014, Winke, 2011). Their perceptions further assist the teaching–learning process by shaping how student needs are identified, instructional strategies are developed, and professional collaboration is fostered (Carley Rizzuto, 2017; Cladis, 2020; Deng et al., 2023; Smata et al., 2021).

Furthermore, research by Amirian (2025) confirmed that teaching experience plays a greater role in shaping EFL teachers' formative assessment literacy than age, with an emphasis on teacher knowledge and teacher-student relationships that support effective assessment practices, while Ataie-Tabar et al.'s (2019) study demonstrated the importance of understanding socio-cultural conceptions in writing assessment literacy, which reinforces the need for relevant context in developing teachers' assessment skills, especially in integrating technology into language assessment practices.

From a different perspective, however, other studies indicated that, although teacher input is widely acknowledged as essential, in practice their roles often remain constrained. This reveals a persistent gap between the ideal expectations of teacher involvement and the realities observed in educational settings. While existing research consistently highlights teachers' expertise, these investigations primarily focus on experienced teachers within well-established educational systems, thereby overlooking pre-service teachers or those working in less-developed institutional

contexts (Jalilzadeh & Coombe, 2023; Pastore, 2023).

2.3. Teachers' Perceptions of Technology in Education

Several studies underlined the positive outcomes of integrating technology into classroom settings, enabling teachers and students to stay connected regardless of time and place. Teachers' preferences for using digital platforms both inside and outside schools to guide learning have also increased (Asad et al., 2021; Hodgson & Shah, 2017; Thaheem et al., 2022). In addition, there is an enhancement of peer interaction, facilitating students to overcome academic obstacles and maintain social engagement (Asad et al., 2021), while fostering self-efficacy among teachers who need to strengthen their pedagogical and technological skills through training programs, as proven during the shift to online instruction in the COVID-19 pandemic (Khan & Abid, 2021).

For learners, technology encourages them to access, select, create, and interpret information more effectively, offering innovative solutions during their learning process (Hashim et al., 2019). Various studies further affirmed its positive correlation with academic achievement and creativity, highlighting cloud computing as an adaptable and cost-effective tool that enhances performance and broadens access to diverse learning resources (Abbasi et al., 2022; Ali et al., 2018; Muhammad et al., 2020).

On the other hand, more recent research highlights several limitations that challenge these views. Rural teachers reported significantly lower TPACK and less positive attitudes toward technology integration compared to urban counterparts, revealing contextual barriers to effective implementation (Sepadi et al., 2025; Yousofi et al., 2025). Other studies also reported the risk of digital cognitive load, where the use of multiple technologies increases demands on learners and negatively impacts well-being (Ibrahim et al., 2025; Surbakti et al., 2024).

2.4. The Shift towards TELA

Advancements in technology have been widely recognized and have profoundly influenced the educational field, particularly in language teaching and assessment. Such recognition has led to a growing interest in integrating technology to facilitate meaningful TELA in classrooms (Bennett et al., 2017; Deeley, 2018). A wide range

of technological tools can now assist teachers in assessing students effectively. Some of the most commonly used types of TELA in language assessment include: Automated Language Proficiency Testing, to assess grammar, fluency, and pronunciation (Abdulaal et al., 2022; Bahari et al., 2023), technology-enhanced formative assessment to provide real-time feedback using platforms such as Classroom Response Systems (CRS) (Luthfiyyah et al., 2021); gamified assessment using digital tools for sentence building or error identification (Marchisio et al., 2019); Mobile-Assisted Language Learning (MALL) through apps and multimedia for language learning or assessment (Zhang & Hasim, 2023); and AI-Assisted Multilingual Systems, which adapt instructional assessment based on individual learners' profiles or levels (Lawrence et al., 2024).

With the increasing integration of digital technologies into education, language assessment practices have also undergone significant transformation. Technology-enhanced alternatives are now supplementing, or even replacing, traditional methods that heavily relied on paper-based tests and face-to-face evaluations. Collectively known as Technology-Enhanced Language Assessment (TELA), these approaches introduce new opportunities for personalization, interactivity, and efficiency in assessing language skills (Hasumi & Chiu, 2024; Huhta & Boivin, 2022; Kaur et al., 2023). Table 1 provides a comparative overview of traditional assessment and TELA, highlighting key differences across various pedagogical and technological dimensions.

Table 1*Traditional Assessment vs TELA*

Aspects	Traditional Assessment	TELA	Source
Media and Method	Mainly paper-based, written test, interview and direct observation	Using digital technology like AI, e-learning platform, online test and interactive multimedia	(Al-Shahri & Mudhsh, 2025; Okoye et al., 2023)
Flexibility	Usually done in a specific location in face-to-face setting	Could be conducted anytime and anywhere with internet access	(Štilić et al., 2023)
Personalization	Static in nature, with one type of item/question applied to all students	Adjust the difficulty level based on student performance	(Halimi & Seridi-Bouchelagh, 2021)
Efficiency	Require more time for manual grading	Automatic in correction and fast feedback	(Khalaf et al., 2020)
Interactivity	Limited to written test,	Able to involve	(Dayo et al.,

Aspects	Traditional Assessment	TELA	Source
Validity & Reliability	interview or direct practices Mainly focus on manual assessment which can lead to subjectivity	simulation, educational game and AI tutors Can use analytical data to analyse answer pattern and detect cheating	2024; Liao et al., 2024) (Dayo et al., 2024)
Accessibility	Does not require complex technological infrastructure	Requires access to technology (computers, internet), which can be a challenge in some regions	(See et al., 2022)
Security	Supervised directly by exam proctors, making it easier to control	Requires online proctoring or AI-based anti-cheating systems to prevent fraud	(Pauline-Graf et al., 2021)
Feedback	Feedback may be delayed as it requires manual grading	Instant and data-driven feedback to enhance learning	(Alruwaili et al., 2025; Sadiq et al., 2024)
Competency assessed	Suitable for memory-based tests, writing skills, and practical evaluations	Suitable for digital skills, data analysis, and interactive problem-solving	(Kim et al., 2022)

Source: Own elaboration.

However, the adoption of technology in assessment remains a complex process influenced by individual, contextual, and technical factors (Brady et al., 2019). Teachers' decisions to utilize technology for assessment often depend on their beliefs regarding its perceived benefits, its ability to meet assessment purposes, and its potential to enhance learner engagement through timely and constructive feedback. In this context, the concept of TELA has been emphasized in research and innovation, highlighting the use of advanced tools to improve both the process and outcomes of language assessment.

Furthermore, the integration of computer technology into language assessment offers distinct advantages. Brown and Abeywickrama (2019) highlighted improvements such as higher scoring accuracy, immediate reporting of results, and the ability to provide detailed statistical analyses, including strengths and weaknesses. However, differences in results between computer-based and paper-based tests suggest that scores from these formats are not directly comparable (Carpenter & Alloway, 2019; Jeong, 2014).

On the other hand, TELA also faces several obstacles, particularly in areas with limited resources, such as limited access to technology and the internet (Kormos &

Wisdom, 2021). Furthermore, low teacher literacy and understanding of TELA, particularly in remote areas of Indonesia, complicate its implementation (Juharyanto et al., 2023; Luschei & Zubaidah, 2012). Technical difficulties such as system errors, compatibility issues, and power outages also negatively affect assessment reliability (Abdelmalak et al., 2023; Julius Malatji & Cedrick Baloyi, 2023). Lastly, over-reliance on technology can diminish the crucial role of human evaluation by teachers (Mdhlalose & Mlambo, 2023; Romero Alonso et al., 2019).

3. Methodology

This study was conducted using a convergent parallel design, a mixed-methods approach, with the primary focus on collecting quantitative and qualitative data simultaneously, while the analysis was conducted separately. Creswell and Creswell (2018) asserted that this design is suitable when researchers aim to compare quantitative statistical results with qualitative findings to complement or enhance the understanding of the research problem. By conducting this study, it is expected to yield significant results in language teaching and learning, particularly for the future preparation of English language teachers.

3.1. Participants

The method used to determine the participants in this study was purposive sampling, where the focus of the population was specifically on pre-service EFL teachers from the University of Darussalam Gontor (Indonesia). The sample consisted of 203 participants, 23.65% male ($n = 48$) and 76.35% female ($n = 155$). The age range varied, with 80.9% of the participants between 18 and 25 years old ($n = 164$) and 19.1% between 26 and 35 years old ($n = 39$). The participants in this study were students of one of the researchers. The procedure involved asking them to complete the online questionnaire at the end of the class session. Additionally, some classes were contacted through a class group message, which included a link to the online questionnaire. Participation in completing the questionnaire was voluntary, with no coercion involved. The confidentiality of all participants' identities was ensured, as there was no section requesting their names. The professional relationship between the researchers and the participants was also maintained, ensuring that their responses were not influenced.

3.2. Instrument

This study employed a questionnaire designed ad hoc, consisting of three main categories related to assessment: (1) general perceptions of assessment (10 items), (2) perceptions of technological use in assessment (14 items), and (3) two open-ended questions related to TELA. The first two sections of the questionnaire utilized a five-point Likert scale ranging from “Totally Disagree” to “Totally Agree.” The questionnaire was administered via Google Forms due to its ease of use and accessibility for both researchers and participants.

Additionally, apart from the free availability of the platform, the Google Forms framework ensured that all items were fully completed, ensuring the consistency and comparability of the collected data (Mondal et al., 2018). To address the construct validity of the instrument, an initial pilot study was conducted. This piloting phase involved a panel of subject-matter experts from the field of educational technology who assessed the questionnaire's items for clarity, relevance, and representativeness of the target constructs, following the Delphi method (Sablitzky, 2022). Experts' feedback was instrumental in refining the instrument, thereby strengthening its construct validity and ensuring it accurately measured the intended variables before full-scale deployment. This step also ensured that the items on the scale comprehensively addressed the concepts and their relevance (Almanasreh et al., 2019). For reliability, Cronbach's alpha was calculated, resulting in a value of 0.894, which indicates consistent results when the questionnaire is tested under different conditions.

3.3. Data Analysis

The data analysis in this study applied both quantitative and qualitative analysis techniques. As for quantitative data, SPSS v. 26 was used, applying a statistical approach to obtain significant perceptions. The analysis focused on computing the mean and Standard Deviation (SD) to examine trends and patterns in the participants' responses to the variables under study. Specifically, this quantitative technique evaluated participants' opinions and perceptions regarding the integration of technology in language assessments. The use of SPSS and statistical techniques is believed to increase the precision of the data being analyzed, thus providing more accurate interpretations of the results. For the qualitative data, Atlas. ti v.23 was employed, identifying and coding the main themes in participants' responses through content analysis.

4. Results

4.1. Quantitative Results

There are two highlights in the questionnaire for this study: participants' perceptions of assessment in general (Q1-Q10) and their perceptions of the use of TELA (Q11-Q24). In addition, participants' responses were presented in the form of percentages per item based on the Likert scale, along with the mean and SD of the questionnaire items. These are presented in Table 2 for Q1-Q10 and Table 3 for Q11-Q24 below.

Table 2
Descriptive Results about General Perceptions on Assessments

Item	N	%					M	SD
		1	2	3	4	5		
Q01	203	71.9	26.1	2.0	0	0	4.70	0.501
Q02	203	55.7	40.9	3.0	0	0	4.51	0.608
Q03	203	52.2	38.9	4.4	0.5	0	4.43	0.666
Q04	203	58.1	35.5	5.9	0	0	4.51	0.632
Q05	203	49.3	42.4	6.4	1.0	1.0	4.38	0.737
Q06	203	44.3	45.3	6.4	2.5	0	4.32	0.724
Q07	203	49.3	41.4	7.4	0.5	0	4.39	0.669
Q08	203	38.4	53.7	7.9	0.5	0	4.30	0.624
Q09	203	36.5	39.4	7.9	3.0	0	4.09	0.830
Q10	203	52.2	42.9	8.4	0.5	0	4.47	0.607

Note. 1 = Totally agree, 2 = Agree, 3 = Neutral, 4 = Disagree, 5 = Totally disagree. M = mean, SD = standard deviation.

Source: Own elaboration.

Most participants in this study demonstrated positive perceptions regarding various aspects that need to be considered in the assessment (Table 2). Starting with Q01, 71.9% of the participants ($n = 154$) strongly agreed that before designing an assessment, teachers need to identify the purpose of the assessment itself. It was then followed by Q02, emphasizing that teachers should consider students' needs when designing assessments as well as highlighting the importance of aligning what is taught in class with what is assessed (Q03). Also, 58% of the participants ($n = 118$) and 35.5% of the participants ($n = 72$) strongly agree and agree with emphasizing the significance of assessments being meaningful to students (Q04). Additionally, 186

participants shared similar voices that teachers should explicitly explain how to complete the tasks or assessments (Q05), with only two participants disagreeing.

Meanwhile, most participants, 44.3% ($n = 90$) and 45.3% ($n = 92$), respectively, emphasized the need for teachers to clearly explain the expected outcomes of an assessment (Q06) and highlighted the importance of teachers supporting students when they encounter challenges during assessments (Q07). Another finding was related to item Q08, where 38% of the participants ($n = 77$) agreed that marking criteria should be connected to the purpose of the assessment and aligned with students' characteristics. Additionally, 36.5% of the participants ($n = 74$) emphasized the necessity of providing detailed information about assessment criteria (Q09).

Lastly, in Q10, most participants agreed that feedback greatly helps students improve their future performance. However, this statement also had the highest percentage of neutral responses regarding assessment, with 8.4% of the participants ($n = 17$) expressing a neutral opinion.

Table 3

Descriptive Results about The Use of Technology on Assessments

Item	N	%					M	SD
		1	2	3	4	5		
Q11	203	50.2	43.3	8.9	0	0	4.44	0.613
Q12	203	26.6	42.9	9.9	4.9	0	3.91	0.846
Q13	203	32.0	45.3	10.3	3.0	0	4.06	0.797
Q14	203	28.1	50.2	10.8	3.0	0	4.03	0.767
Q15	203	35.0	47.8	14.8	1.5	0.5	4.15	0.765
Q16	203	26.1	36.0	15.3	13.8	2.0	3.70	1.063
Q17	203	35.0	48.8	17.7	1.5	0	4.17	0.728
Q18	203	46.8	40.9	18.7	2.5	0	4.32	0.752
Q19	203	27.6	51.7	18.8	2.5	0.5	4.03	0.773
Q20	203	27.2	53.0	19.2	0.5	0.5	4.06	0.724
Q21	203	29.6	48.3	19.7	2.5	0.5	4.04	0.795
Q22	203	47.8	37.9	21.2	3.0	0.5	4.30	0.815
Q23	203	47.8	39.9	22.2	2.0	0.5	4.33	0.742
Q24	203	41.4	49.8	25.6	1.0	0	4.32	0.659

Note. 1 = Totally agree, 2 = Agree, 3 = Neutral, 4 = Disagree, 5 = Totally disagree. M = mean, SD = standard deviation.

Source: Own elaboration.

The data in Table 3 indicate that most participants held positive views, either strongly agreeing or agreeing, regarding the use of technology in assessment. The first aspect highlighted is Q11, where TELA was perceived as beneficial in

supporting the evaluation of language learning. Similarly, Q12 showed that it can help students focus more on learning compared to traditional assessment methods. Additionally, 45.3% of the participants agreed that TELA can increase students' motivation for learning (Q13). Moreover, 50.2% of the participants agreed that it enables teachers to provide better feedback than traditional assessment methods (Q14) and that it facilitates the collection of more comprehensive information about students' potential to use the target language effectively (47.8%, as shown in Q15).

Furthermore, 36.0% of the participants ($n = 73$) agreed that designing TELA increases their workload (Q16), while 15.3% ($n = 31$) remained neutral, and 13.8% ($n = 28$) disagreed. A similar pattern can also be observed in Q17, where teachers expressed interest in using technology in assessments, partly because it can save time (Q18) and help teachers stay more focused when planning assessments (Q19). Additionally, item Q20 suggests that TELA has a positive impact on students' learning outcomes and improves their English proficiency (Q21). Regarding guidance, participants also agreed that teachers need to provide support for using technological tools to complete assessment tasks (Q22), both at home and in class (Q23). Lastly, item Q24 emphasizes the importance of teachers' support for the use of technological tools in language assessment.

4.2. Qualitative Results

To explore this topic more deeply, participants in this study were also asked to respond to two open-ended questions. The first question was, "Do you think the use of technology in assessment makes it easier for students to cheat or plagiarize? Why/why not?" Table 4 summarizes the results of the thematic analysis.

Table 4

Thematic Analysis of Responses on The Impact of Technology in Assessment

Theme	Total number of coded responses	Percentage of coded responses
Supervision	150	25%
Tools and Platforms	120	20%
Student Behaviour	95	16%
Teacher Role	110	18%
Technology	90	15%
Advantages/Disadvantages		
Plagiarism Detection Tools	80	13%
Neutral or Mixed Opinions	45	8%

Source: Own elaboration.

Supervision has emerged as one of the most frequently mentioned themes, with 25% of responses highlighting the importance of preventing cheating when TELA is implemented. Many participants believe that a lack of monitoring by teachers or other stakeholders can allow students to exploit various resources or work dishonestly, whether individually or in groups. Some participant statements below relate to the importance of supervision.

Leaving the students unattended when they use technology during assessment activities may give them the freedom to access any information that will improve their work, thus cheating and not a manifestation of their real abilities. (Participant 6)

I think doing online assessments makes it easier for the students to cheat unless the teacher has a strategy to handle this with other applications/ways of doing supervision. (Participant 25)

...students can open many applications that can help them to answer the assessment as long as the instructor doesn't supervise them properly. (Participant 13)

Therefore, monitoring tools and clear guidelines are needed as solutions. Furthermore, tools and platforms ranked as the second-highest theme, with 20% of the participants emphasizing this aspect.

In addition, some platforms, including Google Forms used in exams, enable students to open other tabs and search for answers during the exam because they lack integrated security features. Consequently, it is recommended to use Pijar as a safer option, which is widely adopted by many schools in Indonesia. Pijar is a digital education platform by Telkom Indonesia that offers various features, such as application-based school exams, digital books, and a school management information system, to support more effective and engaging learning. In addition to assisting with exam administration and school management, Pijar also aims to create equal educational opportunities across Indonesia, including in remote and underserved areas, by integrating technology into the learning process (Pijar Camp, 2024).

Based on my experience in the Teaching Practicum/Internship, during the exam period, the school used *Pijar*, as this app does not allow students to open any other tabs. However, when using Google Forms, some students were able to open other tabs to access information on the internet. (Participant 10)

Student behavior also emerged as a significant theme, with 16% of the participants focusing on ethics, self-discipline, and motivation. This indicates that many students lack confidence or awareness of the consequences of cheating. On the other hand, students who value originality in their work tend to avoid dishonest practices such as cheating or other similar actions.

Plagiarism is not determined by the tools they use. They should be encouraged to build self-confidence and recognize the value of their own ideas. Their environment should appreciate and support their ideas to help boost their confidence. It is important to let them know that their ideas matter, no matter the perspective. (Participant 17)

Many students today tend to be less inclined to read, as they prioritize efficiency over deep learning. They often take pride in using technology for quick results. Moreover, while some applications are designed to support learning, they are frequently misused for cheating instead of their intended educational purpose. (Participant 15)

It depends on the students; plagiarism is not solely influenced by the tools they use. Instead, students need more motivation to build self-confidence and recognize the value of their own ideas. Their environment should foster appreciation for originality, helping them understand that their thoughts and perspectives matter. (Participant 25)

Additionally, the role of teachers is also considered crucial in reducing cheating practices, with 18% of the participants recommending the design of diverse and time-bound assessments and the use of tools such as Turnitin. The importance of proper training was also mentioned, particularly training on the use of technology in assessments.

It depends on the platform and the rules you establish, such as setting a time limit for each question or assessment. However, if teachers fail to recognize potential cheating methods or do not carefully design the tasks, it becomes easier for students to cheat. Therefore, as educators, we should take proactive measures to minimize the possibility of plagiarism and dishonesty. (Participant 3)

As teachers, we must remind our students about the risks of cheating and plagiarism so they understand their academic responsibility. In my view, the use of technology in assessments does not necessarily make it easier for students to cheat.

especially since we now have advanced tools to detect plagiarism effectively. (Participant 20)

In some cases, technology and the internet make it easier for students to cheat, as they can simply search for answers online and copy-paste information. However, technology also provides solutions, such as Turnitin, which allows educators to detect and prevent plagiarism in online assignments and evaluations. (Participant 30)

Finally, the impact of technology itself, both in terms of advantages and disadvantages, accounted for 15%. While tools that can detect plagiarism and simplify teachers' work were recognized as beneficial, there are also drawbacks, such as the misuse of AI tools like ChatGPT. Plagiarism detection tools ranked sixth, with 13% of responses indicating that good control is effective in detecting plagiarism, though this depends on whether institutions are willing to invest in and provide training to staff on their usage.

Technology in assessments has both advantages and challenges when it comes to cheating and plagiarism. On one hand, it gives students quick access to information, which may encourage dishonest practices. On the other hand, the widespread use of online resources and easy copy-paste functions increases the risk of plagiarism. (Participant 9)

...there are many tools available today that make it easier for students to cheat or plagiarize, such as AI-powered tools like ChatGPT. While these technologies can support learning, they are often misused to complete assignments dishonestly. (Participant 4)

Lastly, 8% of the participants expressed neutral or mixed opinions, stating that cheating or plagiarism depends on several factors, such as the design of the assessments, the types of technology tools used, students' mindsets, or other factors. Figure 2 visualizes the key terms derived from participants' responses regarding the impact of technology on assessment. The size of each word represents its frequency, meaning that the larger the word, the more frequently it was mentioned by participants.

Figure 2*Word Cloud of Key Terms: The Impact of Technology in Assessment*

In this word cloud, the most frequently repeated words include “tools” and “teachers,” indicating that educators and the resources they utilize play a crucial role in TELA. Additionally, terms such as “supervision,” “monitoring,” and “detect” highlight the importance of maintaining academic integrity in both the learning process and assessments. Lastly, words like “plagiarism,” “cheat,” “security,” and “ethics” emphasize the necessity of ensuring honesty in assessments, reflecting educators’ concerns about potential misconduct and academic dishonesty.

The second open-ended question addressed was, “Do you think the use of technology in assessment will eventually replace more traditional assessment methods? If so, in what way(s)?” Table 5 provides the thematic analysis results with regard to it:

Table 5*Thematic analysis of responses on TELA vs traditional assessment*

Theme	Total number of coded responses	Percentage of coded responses
Support Replacement	180	27%
Oppose Replacement	90	13%
Conditional Replacement	130	19%
Technology Advantages	160	24%
Traditional Methods Strengths	110	16%

Source: Own elaboration.

From Table 5, it is evident that 27% of the responses expressed the significant potential for TELA to replace traditional assessments due to its efficiency, time-saving features, and varied functionalities such as automated grading, instant feedback, and integrated assessment processes. This includes the use of tools like

Google Forms, Moodle, and Quizizz, which were frequently mentioned. Additionally, 24 of the responses highlighted the advantages of TELA, particularly its ability to simplify assessment processes, provide rapid results, and make the learning process more interactive.

I think the use of technology in assessment has been steadily increasing over the years and will likely continue to evolve. While technology offers numerous benefits, such as efficiency, accessibility, and data analysis, it is unlikely to completely replace traditional assessment methods in all educational settings. (Participant 11)

...today's technology makes assessments more practical, saves time, and eliminates the need for paper-based tests. Automated grading systems help teachers reduce their workload and provide students with real-time feedback. (Participant 4)

Using technology in teaching and learning benefits both teachers and students. While there are pros and cons to using technology for assessment, I believe that incorporating technology into language learning has improved efficiency and saved time. It reduces the burden of grading and reporting students' assessments while allowing for more creative and innovative teaching methods. Additionally, students can take tests from anywhere, providing greater flexibility. (Participant 7)

On the other hand, only 13% of the participants opposed the notion that technology could replace traditional assessments. The main reasons for this opposition included the lack of direct human interaction and the inability of technology to assess subjective skills, such as creativity and critical thinking. Meanwhile, 16% emphasized that traditional assessments are better suited for comprehensive evaluations, especially for skills that cannot or are extremely difficult to assess through digital tools.

...technology needs to be operated and verified by teachers. While artificial intelligence and machine learning can generate information and perform evaluative tasks, they still require human oversight, as they are not always accurate.

Technology lacks human interaction, and language skills often require social engagement for proper assessment. Therefore, technology cannot fully replace traditional assessments, as human judgment remains essential. (Participant 37)

...not all aspects of learning can be assessed using technology. For example, competency-based assessments and skill-based evaluations require direct observation

and human judgment, which technology cannot fully replicate. (Participant 29)

Lastly, 19% of the participants supported a hybrid approach, suggesting that the use of technology should be tailored to the type of assessment, student needs, and available resources. While technology was considered useful for tasks like automated grading, traditional methods remain essential for assessing skills that require direct observation or interaction. Overall, these findings underscore the importance of a balanced approach, integrating the strengths of both traditional and technology-enhanced methods to ensure comprehensive and effective assessments.

I don't think traditional assessment methods will be entirely replaced. Instead, a balanced approach should be adopted. Some skills require human evaluation, while others can benefit from technology-based assessments. (Participant 10)

Not all aspects of assessment can rely on technology. While automated grading is efficient, assessing students' creativity, problem-solving skills, and oral communication still requires human observation. (Participant 23)

In my opinion, technology may not entirely replace traditional assessments, but it can simplify and improve efficiency. For example, in writing assessments, technology can quickly identify spelling and grammar errors, while teachers focus on evaluating content and critical thinking skills. (Participant 37)

Figure 3 illustrates the key terms generated from participants' responses comparing TELA and traditional assessment. Similar to Figure 2, the size of each word indicates its frequency, representing more commonly mentioned concepts.

Figure 3

Word Cloud of Key Terms: TELA vs Traditional Assessment



Technology, traditional, and replacement are the most prominent terms, highlighting the debate on whether TELA should ultimately replace traditional methods or complement them. Additionally, terms like “efficiency,” “saving,” and “modernization” suggest the perceived benefits of TELA, such as time efficiency and flexibility. However, the presence of opposition, limitations, and empirical evidence reflects skepticism regarding TELA’s effectiveness and accessibility compared to traditional assessment.

4.3. Integration of Quantitative and Qualitative Findings

The integration of quantitative and qualitative results provides a more comprehensive understanding of pre-service EFL teachers’ perceptions of TELA. Overall, the quantitative data indicated positive views: for instance, most participants agreed that TELA facilitates the evaluation of language learning (Q11) and helps students remain more focused compared to traditional assessments (Q12). This trend was reinforced by qualitative findings, which emphasized the efficiency, accessibility, and motivational benefits of technology-based assessments (e.g., Participant 7).

At the same time, the quantitative results also revealed concerns, such as the perception that TELA increases teachers’ workload (Q16) and highlights the need for guidance in using technological tools (Q22-Q23). These concerns were echoed in the qualitative data, where many participants highlighted the risk of cheating due to insufficient supervision, particularly when using widely available platforms such as Google Forms. As a solution, participants suggested the use of more secure, government-designed platforms such as *Pijar*, which includes features aimed at minimizing academic dishonesty.

Finally, integrating both data sets offered new perspectives, particularly regarding how assessment should be implemented in the future. The quantitative results showed that 27% of participants supported replacing traditional assessments with TELA, whereas 13% opposed it. These findings were also mirrored in the qualitative data: for instance, Participant 4 emphasized TELA’s efficiency, time-saving potential, and capacity for rapid feedback, while Participant 23 highlighted the irreplaceable role of human interaction and the need to assess creativity and critical thinking.

5. Discussion

The aim of this study was to explore the perceptions of pre-service EFL teachers regarding the use of TELA, particularly its effectiveness, advantages, and limitations compared to traditional assessment methods. Overall, the findings showed a predominantly positive perception, with most participants believing that TELA offers more benefits than drawbacks, such as enhancing assessment efficiency, providing immediate feedback, and fostering student engagement. However, concerns were also raised regarding technological accessibility, which may increase risks such as cheating, as well as the need for teacher training to ensure effective implementation. These findings align with previous studies that emphasize the transformative role of technology in assessment (Bennett et al., 2017; Deeley, 2018) while also acknowledging the challenges associated with its implementation (Brady et al., 2019).

At this point, it seems necessary to revisit the research questions of the study. Regarding the first research question, it concerned Indonesian pre-service EFL teachers' perceptions of the effectiveness of TELA in assessing language proficiency. The findings indicate that most participants viewed TELA as an effective tool for this purpose. Participants believe that TELA allows for a more comprehensive assessment due to its ability to create more varied question formats, enable automatic grading, and provide real-time feedback. This perception aligns with previous research emphasizing the role of technology in facilitating adaptive learning and personalized assessment (Kim et al., 2022; Liao et al., 2024). Furthermore, participants also stated that TELA allows a more interactive and engaging assessment experience, enhancing its effectiveness in measuring students' proficiency across various language skills.

Nonetheless, some participants expressed concerns about whether TELA can accurately measure language competence, which is inherently complex, especially in productive skills such as speaking and writing. This concern is justified, as studies have underscored the challenges of technology in assessing subjective skills, where human judgment is still essential for ensuring accuracy and depth in evaluation (Carpenter & Alloway, 2019; Jeong, 2014). Furthermore, despite the presence of AI-based tools like ChatGPT, which are considered highly beneficial for providing fast and automated feedback (Koraishi, 2023), participants still emphasized that human involvement remains crucial, particularly to ensure the depth and accuracy of language assessments.

The findings were also reinforced by the qualitative data. Participants emphasized

the necessity of strict supervision when implementing TELA to prevent academic dishonesty. Many opined that without adequate monitoring, students could easily access unauthorized sources. Furthermore, participants also highlighted the importance of student discipline as a crucial factor in the success of TELA, particularly in fostering ethical awareness and digital responsibility in educational settings. This aligns with studies that emphasize the role of teacher oversight and structured guidance in maintaining assessment integrity (Pauline-Graf et al., 2021; Sadiq et al., 2024).

In relation to RQ2, the study investigated the potential advantages and limitations of Technology-Enhanced Language Assessment (TELA) and examined how Indonesian pre-service EFL teachers perceive these practices in comparison to traditional assessment methods. The study investigated several advantages of TELA, namely efficiency, accessibility, and personalization. Most participants stated that TELA reduces teachers' workload by automating grading and streamlining assessment processes, which aligns with previous studies highlighting the time-saving benefits of digital assessments (Khalaf et al., 2020). Additionally, TELA also allows for flexible assessment scheduling, so if there is an internet connection and adequate devices, students can easily take assessments regardless of time and place (Štilić et al., 2023). This flexibility can be particularly beneficial in remote learning contexts, where traditional assessment methods may be less feasible.

Regarding disadvantages, EFL pre-service teachers are also aware of several limitations that may arise from TELA. One major concern is the increased risk of cheating and plagiarism, as students may exploit loopholes to access unrestricted sources during assessments. This aligns with studies highlighting the need for strong security measures, especially in online assessments, to ensure academic integrity (Pauline-Graf et al., 2021; Sadiq et al., 2024). Participants emphasized the importance of implementing proctoring software or AI-based anti-cheating tools to mitigate these risks, although there is still ongoing debate about their effectiveness (Dayo et al., 2024).

Furthermore, there were also findings regarding whether TELA will eventually replace traditional assessment. In this regard, there were mixed opinions. Many participants believed that TELA offers advantages in enhancing efficiency and engagement, while others argued that traditional assessment still holds greater value, particularly in evaluating critical thinking, creativity, and other complex cognitive skills that may not be easily measured by automated systems (Deng et al., 2023). This

supports the argument that a blended approach, combining traditional assessment and TELA, provides an effective assessment strategy (See et al., 2022).

6. Conclusion

This study examined the perceptions of Indonesian EFL pre-service teachers about implementing TELA in terms of its effectiveness, drawbacks, and limitations, including comparisons to traditional assessment. The study also showed that TELA provides extensive benefits, particularly in purpose-focused assessment, alignment with instructional objectives, and meaningful feedback to students. However, some concerns also emerged regarding academic integrity, teacher workload, and assessment validity. Many participants suggested the need for close supervision and anti-cheating mechanisms to ensure fair assessments. The study also presented a debate on whether TELA can displace traditional assessments, with some supporting a balanced approach that integrates digital tools with traditional evaluation methods to enhance reliability and comprehensiveness.

The findings recommend specific training to reinforce teachers' digital and assessment literacy to optimize the effectiveness of TELA practices. Additionally, institutions such as schools and universities are strongly advised to invest in secure technology infrastructures to reduce the risk of dishonesty. Policymakers and other stakeholders should work collaboratively to develop a hybrid approach, ensuring that technology complements rather than replaces traditional assessment methods.

This study presents significant insights; however, it focuses solely on pre-service EFL teachers in Indonesia, meaning that its findings may not be fully generalizable to other contexts. Therefore, several aspects could be further developed in future research. First, the study could be expanded by also examining the perspectives of in-service teachers, allowing for a comparative analysis across different experience levels. Second, it could also incorporate students' perspectives to gain a deeper understanding of their views on the implementation of TELA. Lastly, it is essential to investigate the role of AI in assessment to determine to what extent AI can enhance language testing while maintaining ethical and pedagogical soundness.

Ultimately, the presence of TELA is fundamentally aimed at bringing innovation to language assessment. This innovation is intended to ease teachers' workload and introduce new variations in the field of assessment. However, it is also crucial to

consider how its implementation takes shape, including thoughtful integration, teacher preparedness, and ethical considerations. By addressing these challenges, educational institutions can effectively utilize technology to support learning outcomes, particularly through TELA, while ensuring the integrity of assessment remains intact.

References

- Abbasi, W. T., Ibrahim, A. H., & Ali, F. B. (2022). Perceptions about English as a second language teachers' technology-based English language teaching in Pakistan: Attitudes, uses of technology and challenges. In M. Al-Emran, M. A. Al-Sharaf, M. N. Al-Kabi, & K. Shaalan (Eds.), *Proceedings of International Conference on Emerging Technologies and Intelligent Systems* (pp. 314–325). Springer. https://doi.org/10.1007/978-3-030-82616-1_28
- Abdelmalak, M., Cox, J., Ericson, S., Hotchkiss, E., & Benidris, M. (2023). Quantitative resilience-based assessment framework using EAGLE-I Power Outage Data. *IEEE Access*, 11, 7682–7697. <https://doi.org/10.1109/ACCESS.2023.3235615>
- Abdulaal, M. A. A., Alenazi, M. H., Tajuddin, A. J. A., & Hamidi, B. (2022). Dynamic vs. diagnostic assessment: Impacts on EFL learners' speaking fluency and accuracy, learning anxiety, and cognitive load. *Language Testing in Asia*, 12(1). <https://doi.org/10.1186/s40468-022-00179-0>
- Abdullaeva, B. S., Çakmak, F., & Abdullaev, D. (2024). Paper assessment or online assessment: Exploring the impact of assessment modes on EFL students' language learning outcomes and personal development. *Language Testing in Asia*, 14(1). <https://doi.org/10.1186/s40468-024-00309-w>
- Al-Bahlani, S. M., & Ecke, P. (2023). Assessment competence and practices including digital assessment literacy of postsecondary English language teachers in Oman. *Cogent Education*, 10(2). <https://doi.org/10.1080/2331186X.2023.2239535>
- Al-Shahri, H., & Mudhsh, B. A. (2025). Generative AI in Modern Education: Exploring Teachers's Readiness, Benefits, and Challenges. *Language Related Research*, 16(5), 431. <https://doi.org/10.48311/LRR.16.5.7>
- Ali, M. M., Hamid, M. O., & Hardy, I. (2018). Ritualisation of testing:

- Problematizing high-stakes English-language testing in Bangladesh. *Compare: A Journal of Comparative and International Education*, 50(4), 533–553. <https://doi.org/10.1080/03057925.2018.1535890>
- Almanasreh, E., Moles, R., & Chen, T. F. (2019). Evaluation of methods used for estimating content validity. *Research in Social and Administrative Pharmacy*, 15(2), 214–221. <https://doi.org/10.1016/j.sapharm.2018.03.066>
- Alruwaili, A. R., Kianfar, Z., & Azari Noughabi, M. (2025). Exploring EFL Teachers' Motivation and Influential Factors in Adopting AI for Language Teaching. *Language Related Research*, 16(5), 93–124. <https://doi.org/10.48311/LRR/lrr.2025.1654>
- Amirian, S. M. R. (2025). Understanding EFL teachers' formative assessment literacy: Insights from a mixed-methods study. *Language Testing in Asia*, 15(1). <https://doi.org/10.1186/s40468-025-00363-y>
- Asad, M. M., Hussain, N., Wadho, M., Khand, Z. H., & Churi, P. P. (2021). Integration of e-learning technologies for interactive teaching and learning process: An empirical study on higher education institutes of Pakistan. *Journal of Applied Research in Higher Education*, 13(3), 649–663. <https://doi.org/10.1108/JARHE-04-2020-0103>
- Ataie-Tabar, M., Zareian, G., Amirian, S. M. R., & Adel, S. M. R. (2019). A study of socio-cultural conception of writing assessment literacy: Iranian EFL teachers' and students' perspectives. *English Teaching & Learning*, 43(4), 389–409. <https://doi.org/10.1007/s42321-019-00035-0>
- Bahari, A., Wu, S., & Ayres, P. (2023). Improving computer-assisted language learning through the lens of cognitive load. *Educational Psychology Review*, 35(2). <https://doi.org/10.1007/s10648-023-09764-y>
- Bajarias, N., Ramos, R., De Guzman, R., Largo, P., Galicia, D., & Cayogyog, A. (2024). Dynamics of curriculum alignment: Experiences of elementary school teachers in focus. *International Journal of Research and Innovation in Social Science*. <https://doi.org/10.47772/ijriss.2024.807145>
- Barnes, N., Fives, H., & Dacey, C. M. (2017). U.S. teachers' conceptions of the purposes of assessment. *Teaching and Teacher Education*, 65, 107–116. <https://doi.org/10.1016/j.tate.2017.02.017>

- Bearman, M., Nieminen, J. H., & Ajjawi, R. (2022). Designing assessment in a digital world: An organising framework. *Assessment & Evaluation in Higher Education*, 48(3), 291–304. <https://doi.org/10.1080/02602938.2022.2069674>
- Bennett, S., Dawson, P., Bearman, M., Molloy, E., & Boud, D. (2017). How technology shapes assessment design: Findings from a study of university teachers. *British Journal of Educational Technology*, 48(2), 672–682. <https://doi.org/10.1111/bjet.12439>
- Brady, M., Devitt, A., & Kiersey, R. A. (2019). Academic staff perspectives on technology for assessment (TfA) in higher education: A systematic literature review. *British Journal of Educational Technology*, 50(6), 3080–3098. <https://doi.org/10.1111/bjet.12742>
- Brown, H. D. (2004). *Language assessment: Principles and classroom practices*. Pearson Education.
- Brown, H. D., & Abeywickrama, P. (2019). *Language assessment: Principles and classroom practices* (3rd ed.). Pearson.
- Carley Rizzuto, K. (2017). Teachers' perceptions of ELL students: Do their attitudes shape their instruction? *The Teacher Educator*, 52(3), 182–202. <https://doi.org/10.1080/08878730.2017.1296912>
- Carpenter, R., & Alloway, T. (2019). Computer versus paper-based testing: Are they equivalent when it comes to working memory? *Journal of Psychoeducational Assessment*, 37(3), 382–394. <https://doi.org/10.1177/0734282918761496>
- Cladis, A. E. (2020). A shifting paradigm: An evaluation of the pervasive effects of digital technologies on language expression, creativity, critical thinking, political discourse, and interactive processes of human communications. *E-Learning and Digital Media*, 17(5), 341–364. <https://doi.org/10.1177/2042753017752583>
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE.
- Davari Torshizi, M., & Bahraman, M. (2019). I explain, therefore I learn: Improving students' assessment literacy and deep learning by teaching. *Studies in Educational Evaluation*, 61, 66–73. <https://doi.org/10.1016/j.stueduc.2019.03.002>
- Dayo, N., Said Metwaly, S., & Van Den Noortgate, W. (2024). Evaluating

- technology-enhanced learning by using single-case experimental design: A systematic review. *British Journal of Educational Technology*, 55(6), 2457–2477. <https://doi.org/10.1111/bjet.13468>
- Deeley, S. J. (2018). Using technology to facilitate effective assessment for learning and feedback in higher education. *Assessment & Evaluation in Higher Education*, 43(3), 439–448. <https://doi.org/10.1080/02602938.2017.1356906>
- Deng, L., Zhang, L. J., & Mohamed, N. (2023). Exploring native and non-native English speaker teachers' perceptions of English teacher qualities and their students' responses. *Frontiers in Psychology*, 14. <https://doi.org/10.3389/fpsyg.2023.1175379>
- Denton, P., & McIlroy, D. (2018). Response of students to statement bank feedback: the impact of assessment literacy on performances in summative tasks. *Assessment & Evaluation in Higher Education*, 43(2), 197–206. <https://doi.org/10.1080/02602938.2017.1324017>
- Derakhshan, A., & Zhang, L. J. (2024). Applications of psycho-emotional traits in technology-based language education (TBLE): An introduction to the special issue. *The Asia-Pacific Education Researcher*, 33, 741–745. <https://doi.org/10.1007/s40299-024-00881-y>
- Derakhshan, A., Corral-Robles, S., Ortega-Martín, J. L., & Ortega-Rodríguez, P. (2026). Unpacking Spanish EFL teachers' perceptions about the role of artificial intelligence (AI) technologies in their pedagogical decision-making: A phenomenological analysis. *European Journal of Education*, 61, e70639 <https://doi.org/10.1111/ejed.70639>
- Derakhshan, A., Karimpour, S., Alizadeh Oghyanous, P., & Nazari, M. (2026). The interconnection between teacher motivation and identity construction: An interpretative phenomenological approach. *Applied Linguistics Review*, 17(1), 25–46. <https://doi.org/10.1515/applirev-2024-0157>
- Derakhshan, A., Park, Y., & Lalli, G. S. (2026). Exploring the role of AI technology adoption in at-risk students' absenteeism and boredom. *International Journal of TESOL Studies*, 8(1), 128–145. <https://doi.org/10.58304/ijts.260402>
- Djoub, Z. (2017). Assessment literacy: Beyond teacher practice. In R. Al-Mahrooqi, C. Coombe, F. Al-Maamari, & V. Thakur (Eds.), *Revisiting EFL assessment* (pp. 9–27). Springer. https://doi.org/10.1007/978-3-319-32601-6_2

- Elmore, R. F. (2019). The future of learning and the future of assessment. *ECNU Review of Education*, 2(3), 328–341. <https://doi.org/10.1177/2096531119878962>
- Estaji, M. (2024). Unveiling the impact of language assessment teacher education on EFL teachers' assessment agency and professional development trajectory: Perceptions, opportunities, and challenges. *Language Testing in Asia*, 14(1). <https://doi.org/10.1186/s40468-024-00292-2>
- Fan, J., Frost, K., & Liu, B. (2020). Teachers' involvement in high-stakes language assessment reforms: The case of Test for English Majors (TEM) in China. *Studies in Educational Evaluation*, 66, 100898. <https://doi.org/10.1016/j.stueduc.2020.100898>
- Festiyed, F., Novitra, F., Yohandri, Y., & Asrizal, A. (2022). Networked-based inquiry: An effective physics learning in the new normal COVID-19 era in Indonesia. *International Journal of Instruction*, 15(2), 997–1016. <https://doi.org/10.29333/iji.2022.15255a>
- Firoozi, T., Razavipour, K., & Ahmadi, A. (2019). The language assessment literacy needs of Iranian EFL teachers with a focus on reformed assessment policies. *Language Testing in Asia*, 9(1), 2. <https://doi.org/10.1186/s40468-019-0078-7>
- Giraldo, F. (2021). Language assessment literacy: Insights for educating English language teachers through assessment. *HOW*, 28(3), 78–92. <https://doi.org/10.19183/how.28.3.673>
- Giraldo, F., & Yan, X. (2025). Evaluating an online assessment course: Teachers' voices on their language assessment literacy. *PROFILE: Issues in Teachers' Professional Development*, 27(1), 97–114. <https://doi.org/10.15446/profile.v27n1.113304>
- Giraldo, F., Naranjo-Trujillo, D. E., & Ariza-Villa, J. A. (2023). From the design of assessments to language assessment literacy. *Folios*, 58. <https://doi.org/10.17227/folios.58-16385>
- Hafizuddin Mohamed Jamrus, M., Asnawi Zamri, A., Hafidzudeen Norazizan, M., & Haekal Kamarulzaman, M. (2024). Using peer evaluation as a tool in English language learning in Malaysian classroom. *International Journal of Research and Innovation in Social Science*, 8(9), 121–132. <https://doi.org/10.47772/IJRIS.2024.809010>
- Halimi, K., & Seridi-Bouchelaghem, H. (2021). Students' competencies discovery

- and assessment using learning analytics and semantic web. *Australasian Journal of Educational Technology*, 37(5), 77–97. <https://doi.org/10.14742/ajet.7116>
- Hamre, B. K., Pianta, R. C., Downer, J. T., DeCoster, J., Mashburn, A. J., Jones, S. M., Brown, J. L., Cappella, E., Atkins, M., Rivers, S. E., Brackett, M. A., & Hamagami, A. (2013). Teaching through interactions. *The Elementary School Journal*, 113(4), 461–487. <https://doi.org/10.1086/669616>
- Harden, R. M., & Lilley, P. (2024). A traditional or an innovative approach to assessment: The Assessment PROFILE. *Medical Teacher*, 47(1), 50–57. <https://doi.org/10.1080/0142159X.2024.2436443>
- Hashim, H., Rafiqah M. Rafiq, K., & Md. Yunus, M. (2019). Improving ESL learners' grammar with gamified learning. *Arab World English Journal (AWEJ) Special Issue on CALL*, 5, 41–50. <https://doi.org/10.24093/awej/call5.4>
- Hasumi, T., & Chiu, M. S. (2024). Technology-enhanced language learning in English language education: Performance analysis, core publications, and emerging trends. *Cogent Education*, 11(1). <https://doi.org/10.1080/2331186X.2024.2346044>
- Hodgson, V., & Shah, U. (2017). A phenomenographic study of lecturers' conceptions of using learning technology in a Pakistani context. *Learning, Media and Technology*, 42(2), 198–213. <https://doi.org/10.1080/17439884.2016.1154074>
- Huhta, A., & Boivin, N. (2022). Changes in language assessment through the lens of new materialism. In *Language assessment in the digital age* (pp. 39–56). Springer. https://doi.org/10.1007/978-3-031-13847-8_3
- Ibrahim, R. K., Marar, Y. A. A., Salman, M., Jehad, S., Hamza, M. G., Abouelnasr, A. S., Abdelaliem, S. M. F., Alahmedi, S. H., & Hendy, A. (2025). Impact of multiple educational technologies on well-being: The mediating role of digital cognitive load. *BMC Nursing*, 24(1). <https://doi.org/10.1186/s12912-025-03655-z>
- Jalilzadeh, K., & Coombe, C. (2023). Correction: Constraints in employing learning-oriented assessment in EFL classrooms: Teachers' perceptions. *Language Testing in Asia*, 13(1). <https://doi.org/10.1186/s40468-023-00226-4>
- Jeong, H. (2014). A comparative study of scores on computer-based tests and paper-

- based tests. *Behaviour & Information Technology*, 33(4), 410–422. <https://doi.org/10.1080/0144929X.2012.710647>
- Juharyanto, J., Arifin, I., Sultoni, S., Adha, M. A., & Qureshi, M. I. (2023). Antecedents of primary school quality: The case of remote areas schools in Indonesia. *SAGE Open*, 13(1). <https://doi.org/10.1177/21582440221144971>
- Julius Malatji, E., & Cedrick Baloyi, N. (2023, July 28). Analysis of ramifications of power outages on online teaching and learning in South Africa. *Proceedings of the 9th International Conference on New Findings in Humanities and Social Sciences*. <https://doi.org/10.33422/9th.hsconf.2023.07.130>
- Kaur, P., Kumar, H., & Kaushal, S. (2023). Technology-assisted language learning adaptive systems: A comprehensive review. *International Journal of Cognitive Computing in Engineering*, 4, 301–313. <https://doi.org/10.1016/j.ijcce.2023.09.002>
- Khalaf, K., El-Kishawi, M., Mustafa, S., & Al Kawas, S. (2020). Effectiveness of technology-enhanced teaching and assessment methods of undergraduate preclinical dental skills: A systematic review of randomized controlled clinical trials. *BMC Medical Education*, 20(1), 286. <https://doi.org/10.1186/s12909-020-02211-4>
- Khan, Z. H., & Abid, M. I. (2021). Distance learning in engineering education: Challenges and opportunities during COVID-19 pandemic crisis in Pakistan. *The International Journal of Electrical Engineering & Education*. Advance online publication. <https://doi.org/10.1177/0020720920988493>
- Kim, A. A., Tywoniw, R. L., & Chapman, M. (2022). Technology-enhanced items in Grades 1–12 English language proficiency assessments. *Language Assessment Quarterly*, 19(4), 343–367. <https://doi.org/10.1080/15434303.2022.2039659>
- Koraishi, O. (2023). Teaching English in the age of AI: Embracing ChatGPT to optimize EFL materials and assessment. *Language Education and Technology Journal*, 3(1). <http://langedutech.com>
- Kormos, E., & Wisdom, K. (2021). Rural schools and the digital divide. *Theory & Practice in Rural Education*, 11(1). <https://doi.org/10.3776/tpre.2021.v11n1p25-39>
- Kormos, E., & Wisdom, K. (2023). Digital divide and teaching modality: Its role in technology and instructional strategies. *Education and Information Technologies*,

- 28(8), 9985–10003. <https://doi.org/10.1007/s10639-022-11488-5>
- Kremmel, B., & Harding, L. (2020). Towards a comprehensive, empirical model of language assessment literacy across stakeholder groups: Developing the language assessment literacy survey. *Language Assessment Quarterly*, 17(1), 100–120. <https://doi.org/10.1080/15434303.2019.1674855>
- Lan, C., & Fan, S. (2019). Developing classroom-based language assessment literacy for in-service EFL teachers: The gaps. *Studies in Educational Evaluation*, 61, 112–122. <https://doi.org/10.1016/j.stueduc.2019.03.003>
- Lawrence, L., Echeverria, V., Yang, K., Aleven, V., & Rummel, N. (2024). How teachers conceptualise shared control with an AI co-orchestration tool: A multiyear teacher-centred design process. *British Journal of Educational Technology*, 55(3), 823–844. <https://doi.org/10.1111/bjet.13372>
- Liao, X., Zhang, X., Wang, Z., & Luo, H. (2024). Design and implementation of an AI-enabled visual report tool as formative assessment to promote learning achievement and self-regulated learning: An experimental study. *British Journal of Educational Technology*, 55(3), 1253–1276. <https://doi.org/10.1111/bjet.13424>
- Luschei, T. F., & Zubaidah, I. (2012). Teacher training and transitions in rural Indonesian schools: A case study of Bogor, West Java. *Asia Pacific Journal of Education*, 32(3), 333–350. <https://doi.org/10.1080/02188791.2012.711241>
- Luthfiyyah, R., Aisyah, A., & Sulisty, G. H. (2021). Technology-enhanced formative assessment in higher education: A voice from Indonesian EFL teachers. *EduLite: Journal of English Education, Literature and Culture*, 6(1), 42–54. <https://doi.org/10.30659/e.6.1.42-54>
- Marchisio, M., Barana, A., Floris, F., Marell, C., Pulvirenti, M., Rabellino, S., & Sacchet, M. (2019). Adapting STEM automated assessment system to enhance language skills. In *Proceedings of the 15th International Scientific Conference eLearning and Software for Education* (pp. 403–410). <https://doi.org/10.12753/2066-026X-19-126>
- Marsh Runyon, K. R., D. Montilus, K., Nachman, L., Smith Herrick, K., & Ferrara, L. (2022). ETS® AI Labs™ ways of working tutorial: How to build evidence-based, user-obsessed, AI-enabled learning solutions in an agile framework. In M. M. Rodrigo, N. Matsuda, A. I. Cristea, & V. Dimitrova (Eds.), *Artificial intelligence in education. Posters and late breaking results, workshops and*

- tutorials, industry and innovation tracks, practitioners' and doctoral consortium (pp. 119–122). Springer. https://doi.org/10.1007/978-3-031-11647-6_21
- Mdhlalose, D., & Mlambo, G. (2023). Integration of technology in education and its impact on learning and teaching. *Asian Journal of Education and Social Studies*, 47(2), 54–63. <https://doi.org/10.9734/ajess/2023/v47i21021>
- Mondal, H., Mondal, S., Ghosal, T., & Mondal, S. (2019). Using Google Forms for medical survey: A technical note. *International Journal of Clinical and Experimental Physiology*, 5(4), 216–218. <https://doi.org/10.5530/ijcep.2018.5.4.26>
- Muhammad, A., Palitha Edirisingha, Ali, R., & Shehzad, S. (2020). Teachers' practices in blended learning environment: Perception of students at secondary education level. *Journal of Education and Educational Development*, 7(2). <https://doi.org/10.22555/joeed.v7i2.19>
- Nieminen, J. H., Bearman, M., & Ajjawi, R. (2022). Designing the digital in authentic assessment: Is it fit for purpose? *Assessment & Evaluation in Higher Education*, 48(4), 529–543. <https://doi.org/10.1080/02602938.2022.2089627>
- Okoye, K., Daruich, S. D. N., De La O, J. F. E., Castano, R., Escamilla, J., & Hosseini, S. (2023). A text mining and statistical approach for assessment of pedagogical impact of students' evaluation of teaching and learning outcome in education. *IEEE Access*, 11, 9577–9596. <https://doi.org/10.1109/ACCESS.2023.3239779>
- Ölmezer-Öztürk, E., & Aydın, B. (2019). Voices of EFL teachers as assessors: Their opinions and needs regarding language assessment. *Journal of Qualitative Research in Education*, 7(1), 1–18. <https://doi.org/10.14689/issn.2148-2624.1.7c1s.17m>
- Pandey, G. P. (2024). Language testing reimaged: Enhancing teaching and learning in English education. *Journal of Practical Studies in Education*, 5(6), 16–24. <https://doi.org/10.46809/jpse.v5i6.92>
- Pastore, S. (2023). Teacher assessment literacy: A systematic review. *Frontiers in Education*, 8. <https://doi.org/10.3389/feduc.2023.1217167>
- Pauline-Graf, D., Mandel, S. E., Allen, H. W., & Devnew, L. E. (2021). Assumption validation process for the assessment of technology-enhanced learning. *Contemporary Educational Technology*, 13(4), ep316.

<https://doi.org/10.30935/cedtech/11071>

Pijar Camp. (2024). *Tentang Pijar Camp*. <https://camp.pijarmahir.id/help/about-us>

Qi, S., & Derakhshan, A. (2025). Technology-based collaborative learning: EFL learners' social regulation and modifications in their academic emotions and academic performance. *Education and Information Technologies*, 30(7), 8611–8636. <https://doi.org/10.1007/s10639-024-13167-z>

Romero Alonso, R., Riquelme Plaza, I., & Halal Orfali, C. (2019). Barriers in teacher perception about the use of technology for evaluation in higher education. *Digital Education Review*, 35, 170–185. <https://doi.org/10.1344/der.2019.35.170-185>

Sablatzky, T. (2022). The Delphi method. *Hypothesis: Research Journal for Health Information Professionals*, 34(1). <https://doi.org/10.18060/26224>

Sadiq, N., Fatima, S. H., Shabnam, N., & Rauf, A. (2024). Empowering health professions educators: Enhancing curriculum delivery through customized e-tutorial training on fundamental digital tools. *Frontiers in Medicine*, 11. <https://doi.org/10.3389/fmed.2024.1342654>

See, B. H., Gorard, S., Lu, B., Dong, L., & Siddiqui, N. (2022). Is technology always helpful? A critical review of the impact on learning outcomes of education technology in supporting formative assessment in schools. *Research Papers in Education*, 37(6), 1064–1096. <https://doi.org/10.1080/02671522.2021.1907778>

Sepadi, M., Kgaphola, T., & Molapo, K. (2025). Teachers' understanding of technology usage in rural schools. *Frontiers in Education*, 10. <https://doi.org/10.3389/feduc.2025.1548457>

Smata, S., Gillies, R., McLay, K., & Nguyen, H. (2021). Second language teachers' perceptions of their pedagogical practices, collaborations, and relationships with other teachers through professional development. *Australian Journal of Teacher Education*, 46(9), 39–54. <https://doi.org/10.14221/ajte.2021v46n9.3>

So, Y. (2014). Are teacher perspectives useful? Incorporating EFL teacher feedback in the development of a large-scale international English test. *Language Assessment Quarterly*, 11(3), 283–303. <https://doi.org/10.1080/15434303.2014.936936>

Štilić, A., Puška, E., Puška, A., & Božanić, D. (2023). An expert-opinion-based evaluation framework for sustainable technology-enhanced learning using z-

- numbers and fuzzy logarithm methodology of additive weights. *Sustainability*, 15(16), 12253. <https://doi.org/10.3390/su151612253>
- Surbakti, R., Umboh, S. E., Pong, M., & Dara, S. (2024). Cognitive load theory: Implications for instructional design in digital classrooms. *International Journal of Educational Narratives*, 2(6), 483–493. <https://doi.org/10.70177/ijen.v2i6.1659>
- Thaheem, S. K., Zainol Abidin, M. J., Mirza, Q., & Pathan, H. U. (2022). Online teaching benefits and challenges during pandemic COVID-19: A comparative study of Pakistan and Indonesia. *Asian Education and Development Studies*, 11(2), 311–323. <https://doi.org/10.1108/AEDS-08-2020-0189>
- Theall, M., & Franklin, J. (2010). Assessing teaching practices and effectiveness for formative purposes. In K. J. Gillespie & D. L. Robertson (Eds.), *A guide to faculty development* (2nd ed., pp. 151–168). Jossey-Bass.
- Tsagari, D., & Vogt, K. (2017). Assessment literacy of foreign language teachers around Europe: Research, challenges and future prospects. *Studies in Language Assessment*, 41–63. <https://doi.org/10.58379/UHIX9883>
- Vogt, K., Tsagari, D., Csépes, I., Green, A., & Sifakis, N. (2020). Linking learners' perspectives on language assessment practices to teachers' assessment literacy enhancement (TALE): Insights from four European countries. *Language Assessment Quarterly*, 17(4), 410–433. <https://doi.org/10.1080/15434303.2020.1776714>
- Weng, F., & Shen, B. (2022). Language assessment literacy of teachers. *Frontiers in Psychology*, 13. <https://doi.org/10.3389/fpsyg.2022.864582>
- Winke, P. (2011). Evaluating the validity of a high-stakes ESL test: Why teachers' perceptions matter. *TESOL Quarterly*, 45(4), 628–660. <https://doi.org/10.5054/tq.2011.268063>
- Yang, X. (2023). Formative assessment methods of English language application competence based on consistency evaluation. *Computer-Aided Design and Applications*, 84–103. <https://doi.org/10.14733/cadaps.2023.S12.84-103>
- Yang, Y. (2022). Assessing alignment between curriculum standards and teachers' instructional practices in China's school music education. *Research Studies in Music Education*, 45(1), 56–76. <https://doi.org/10.1177/1321103X221099852>
- Yousofi, R., Golzar, J., & Yacoub, O. (2025). Digital divides and bridges: Equity

implications of EdTech in ESL education. *Frontiers in Education*, 10. <https://doi.org/10.3389/feduc.2025.1590828>

Zhang, S., & Hasim, Z. (2023). Gamification in EFL/ESL instruction: A systematic review of empirical research. *Frontiers in Psychology*, 13. <https://doi.org/10.3389/fpsyg.2022.1030790>

Zhao, L., Zhao, B., & Li, C. (2023). Alignment analysis of teaching–learning–assessment within the classroom: How teachers implement project-based learning under the curriculum standards. *Disciplinary and Interdisciplinary Science Education Research*, 5(1). <https://doi.org/10.1186/s43031-023-00078-1>

Zulaiha, S., Mulyono, H., & Ambarsari, L. (2020). An investigation into EFL teachers' assessment literacy: Indonesian teachers' perceptions and classroom practice. *European Journal of Contemporary Education*, 9(1). <https://doi.org/10.13187/ejced.2020.1.189>

About the Authors

Muhammad Haikal is a lecturer in the Department of English Language Teaching at the University of Darussalam Gontor (Indonesia) and a PhD candidate in the Department of Language and Culture at the University of Córdoba (Spain). He is a member of the Research Group HUM-1122 *Research in Languages, Technology and Education* (RELATED). His research interests focus on Computer-Assisted Language Learning (CALL), Teaching English as a Foreign Language (TEFL), bilingual education, and the integration of educational technologies into language teaching and learning.

Cristina A. Huertas-Abril is a Full Professor in the Department of English and German Studies at the University of Córdoba (Spain), where she teaches at the Faculty of Education Sciences and Psychology. She is the principal investigator of the Research Group HUM-1122 *Research in Languages, Technology and Education* (RELATED). Her research interests include Computer-Assisted Language Learning (CALL), Collaborative Online International Learning (COIL), Teaching English as a Foreign Language (TEFL), bilingual education, and teacher education

Francisco Javier Palacios-Hidalgo is an Associate Professor in the Department of English and German Studies at the University of Córdoba (Spain), where he teaches at the Faculty of Education Sciences and Psychology. He is a member of the Research Group HUM-1122 *Research in Languages, Technology and Education* (RELATED). His research focuses on Teaching English as a Foreign Language (TEFL), language teacher education, bilingual education, educational technologies, teacher digital literacy, and queer pedagogy.