Prospective teacher online assessment literacy of English Language Education study program at Undiksha

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Abstract

The role of prospective teachers continues to evolve alongside advancements in education and technology. As digital learning environments become more prevalent, educators must be equipped with essential competencies, including online assessment literacy. This study examines the level of online assessment literacy among sixth-semester prospective teachers in the English Language Education Program at Universitas Pendidikan Ganesha (Undiksha). Given the increasing reliance on digital assessment tools, understanding prospective teachers' readiness is crucial for effective teaching and learning. This research involved 73 students who had completed assessment courses, utilizing a structured questionnaire to measure their proficiency across seven key dimensions of assessment. The findings indicate that most participants demonstrate a moderate level of online assessment literacy. On average, female students scored 50.5%, while male students scored 46.4%. The highest score among female students was in the Recognizing Ethics (RE) dimension (62.7%), whereas male students scored highest in the Communicating (CO) dimension (55.6%). Conversely, the lowest scores were recorded in the Developing (DE) dimension, with 36.8% for females and 31.9% for males, indicating difficulties in designing effective assessment tools. These findings highlight the need for practical training that enhances digital assessment competencies. Integrating workshops, digital assessment simulations, and targeted pedagogical training into the curriculum can help bridge the gap between theoretical knowledge and practical application. This research provides valuable insights for teacher training programs, ensuring prospective educators are well-prepared for digital assessment challenges.

Keywords: Online Assessment Literacy; Prospective Teachers; English, Gender; Curriculum Development

1. Introduction

The integration of technology in education is no longer optional but a necessity in today's digital era (Faloye & Faniran, 2023). Digital tools have transformed instructional practices, enabling interactive and personalized learning experiences (Chander & Arora, 2021). Platforms like Learning Management Systems (LMS), cloud-based tools, and interactive applications have enhanced accessibility, collaboration, and adaptability in learning (Husain, 2021). As educational

institutions embrace these technologies, educators must develop competencies in using digital tools effectively for teaching and assessment (Mufanti et al., 2024). Digital assessments, such as online quizzes and automated grading, offer efficient and personalized evaluations, allowing educators to track student performance in real time and assess skills beyond traditional methods (Nguyen & Habók, 2024). Therefore, equipping teachers with digital assessment skills is essential for maintaining the validity and reliability of evaluations (Pambudi & Windasari, 2022).

The English Language Education Program at Universitas Pendidikan Ganesha (Undiksha) has incorporated digital assessment training into its curriculum to address this need. Sixth-semester students engage in structured coursework covering assessment design, digital evaluation tools, and best practices in technology-based assessment. They explore platforms like Google Forms, Kahoot, and Quizizz, learning to create and administer online tests (Yu & Xu, 2024). Additionally, they receive training in developing valid test items, evaluating digital assessment tools based on usability and ethical considerations, and interpreting assessment results using digital analytics (Estaji et al., 2024). This approach ensures prospective teachers gain the skills necessary to design effective and data-driven assessments while addressing academic integrity and technological bias (Zhang et al., 2024).

Several studies have explored various aspects of prospective teachers' assessment literacy and professional development. Amador et al. (2021) analyzed 43 studies on teachers' noticing ability, highlighting the effectiveness of semester-long interventions using the "Learning to Notice" framework. Aghabarari & Rahimi (2020) found that teaching practice enhances EFL teachers' classroom management and pedagogical strategies despite challenges like supervisory expectations. Kavenuke et al. (2020) emphasized the need to strengthen prospective teachers' self-confidence in critical thinking. Abduraimova (2024) reported moderate self-efficacy among English teachers, while Yu & Xu (2024) highlighted gaps in test takers' language assessment literacy on the Duolingo English Test. Nguyen & Habók (2024) reviewed digital literacy assessment tools, stressing the importance of digital competence in education. Farmasari et al. (2023) found moderate satisfaction with assessment training among prospective teachers at the University of Mataram, while Dewi & Artini (2023) identified gender differences in students' perceptions of effective teaching. Lastly, Husain (2021) pointed out the lack of digital assessment literacy among pre-service teachers, underscoring the need for better training in technology integration. These findings highlight the importance of improving prospective teachers' online assessment literacy and pedagogical skills to enhance teaching effectiveness.

Despite the growing reliance on digital assessment, research on online assessment literacy remains limited, particularly in English Language Education in Indonesia (Oktarini, 2022). Existing studies focus on in-service teachers, leaving a gap in understanding how teacher training programs prepare prospective educators for online assessments (Oo et al., 2022). Additionally, the influence of gender on assessment literacy remains inconclusive, with some studies indicating no significant differences, while others suggest varying perceptions and implementation approaches (Ratnasari et al., 2024). Given these gaps, this research aims to examine prospective teachers' online assessment literacy at Undiksha, providing insights into their competencies and challenges. The findings will inform policy decisions, enhance teacher education programs, and ensure that future educators can navigate digital assessment practices in modern educational settings (Oberländer et al., 2020).

2. Method

This study employed a quantitative cross-sectional survey design to assess the online assessment literacy of prospective English teachers at Ganesha University of Education (Undiksha). A closed-ended questionnaire with 28 items was used to measure various dimensions of online assessment literacy, with data analyzed using descriptive statistical methods to determine overall

literacy levels and gender-based variations. The study was conducted at the Faculty of Language and Arts, targeting sixth-semester students from the English Education Study Program, as they have received assessment training and are preparing for teaching careers. A purposive sampling technique was used, selecting students who had completed assessment-related courses and teaching practice, ensuring a representative sample for evaluating their competencies, perceptions, and readiness regarding online assessment.

This study employs a convenience sampling technique, a non-random method where participants are selected based on availability and accessibility, allowing for quick data collection while minimizing logistical constraints. Sixth-semester students from the English Language Education Program at Universitas Pendidikan Ganesha were chosen due to their relevance to the research and ease of access. Although this method may not fully represent the entire population, it provides practical insights into online assessment literacy among prospective teachers. A total of 73 students participated in the study, offering a sample that, while limited, is expected to reflect key aspects of the research objectives.

This study focuses on the variable of "online assessment literacy," examining its impact on educational practices within digital learning environments. By analyzing how proficiency in online assessment influences teaching outcomes, the research aims to provide insights into the role of digital assessment literacy in teacher preparation. To collect data, a structured questionnaire was used to assess the online assessment literacy of sixth-semester students in the English Language Education Program at Universitas Pendidikan Ganesha. Adapted from established assessment literacy frameworks, the questionnaire measured competencies across seven key dimensions, helping to evaluate prospective teachers' preparedness to implement digital assessments in their future careers. The findings are expected to offer valuable recommendations for educators and policymakers to enhance digital skills in teacher training programs.

The content validity evaluation employed a five-point rating scale to assess the appropriateness of each questionnaire item. The validity index (V) was determined using expert ratings, with key variables including r (the rating assigned by an expert), lo (the minimum score in the scale), c (the total number of available rating categories), and n (the number of expert raters). This method systematically evaluates content validity, ensuring that the questionnaire items effectively measure the intended construct (Husain, 2021b).

The content validity assessment revealed that 27 questionnaire items were rated highly valid by expert judges, with 26 items achieving the maximum score of 1 and one item scoring 0.83. Another item, categorized as moderately valid with a score of 0.67, may need refinement for better alignment with the theoretical framework of online assessment literacy. Reliability was assessed using the Intraclass Correlation Coefficient (ICC) to measure agreement between expert raters. Based on Koo and Li's (2016) classification, an ICC value of at least 0.70 is required for the questionnaire to be considered a reliable tool for evaluating prospective teachers' online assessment literacy.

Tabel 1 Intraclass Correlation Coefficient

Measure Type	ICC	95% Confidence Interval	F Value	df1	df2	p-value
Single Measures	.658	[.384, .826]	4.852	27	27	.000
Average Measures	.794	[.555, .905]	4.852	27	27	.000

The results of the ICC analysis indicate that the questionnaire demonstrated good reliability for single measurements, with an ICC value of 0.658, while the reliability for average measurements

was found to be high, with an ICC value of 0.794. The 95% confidence intervals for single measurements ranged from 0.384 to 0.826, indicating some variability, whereas the confidence intervals for average measurements were between 0.555 and 0.905, suggesting greater stability. Both ICC values were statistically significant (F = 4.582, p < .001), confirming that the observed reliability was not due to random chance. These findings suggest that while individual measurements exhibit an acceptable level of reliability, averaging multiple measurements significantly enhances the consistency of the results, making the instrument more robust for assessing online assessment literacy.

The study examined the online assessment literacy of prospective English Language Education teachers at Universitas Pendidikan Ganesha (Undiksha). The participants had completed an assessment course and a teaching practicum, making them ideal for evaluating their understanding of online assessments. Data was collected through a structured questionnaire via Google Forms, designed to measure their knowledge and readiness for digital assessment tools in education.

The responses were analyzed using descriptive statistics, including measures such as variance, mean, and standard deviation. This approach helped summarize key trends in the data, assess participants' proficiency, and identify areas requiring further development. The findings aim to inform improvements in teacher training programs and curricula, ensuring future educators are well-equipped to handle online assessments in modern teaching environments. The range, which denotes the difference between a dataset's highest and lowest values, is a basic dispersion metric in data analysis (Setiawan, 2017). It illustrates how dispersed the values are, giving a brief summary of the degree of variability in the data. The least value in the dataset is subtracted from the largest value to determine the range. Although the range provides a general idea of the dispersion of the data, it is not indicative of the distribution of values between the extremes and is quite susceptible to outliers. Consequently, the range is frequently used in conjunction with other measures of dispersion, such as variance and standard deviation, to provide a more thorough analysis, even though it is helpful for a general understanding of data variability.

3. Findings

This study examines the online literacy assessment of sixth-semester prospective teachers in the English Language Education program at Undiksha. A structured questionnaire with 28 questions was used to assess seven dimensions of assessment, and it was distributed online to 73 students. The collected data was analyzed using descriptive statistics to determine overall literacy levels and identify differences based on gender. The findings highlight strengths and areas for improvement among male and female students. The demographic data shows that most participants were female (75.34%), while males comprised 24.66%, providing context for analyzing gender-based variations in online assessment literacy:

Table 3. Demographic Profile of Respondents (N=73)

Demographist	Total
Gender	
Male	18
Female	55

The next stage conducted by the researchers was analysing the average score of each assessment dimension as well as the overall average of prospective teachers' assessment literacy. This analysis aimed to gain a deeper understanding of prospective teachers' competencies in assessment literacy and to identify their strengths and weaknesses. By conducting this analysis, the

researchers were able to provide a clearer picture of the prospective teachers' level of competence in conducting assessments, which is crucial in modern education.

Tabel 4. Average of Prospective Teacher Online Assessment Literacy

Demographist	Average							
	CH	DE	AD	UD	UG	CO	RE	LADCG
Gender								
Male	48,6	31,9	55,6	54,2	40,3	55,6	38,9	46,4
Female	49,5	36,8	62,3	50,5	45,5	62,7	46,4	50,5

Table 4. illustrates the differences in average scores obtained based on the gender demographic categories of prospective teachers. This table also shows the average values of several indicators, namely Choosing (CH), Developing (DE), Administering (AD), Using-Decision (UD), Using-Grading (UG), Communicating (CO), Recognizing Ethics (RE), dan LADCG (Literacy in Digital Classroom Grading and Assessment). The indicators mentioned are relevant competencies in measuring the assessment of prospective teachers.

This table differentiates between male and female teacher candidates based on their average scores in each category. The average score for male teacher candidates ranges from 31.9% to 55.6%, with the highest score recorded in the CO (Communicating) catego ry, indicating their ability to clearly and effectively communicate assessment results. Conversely, the lowest score was observed in the DE (Developing) category, which measures their ability to develop assessment instruments aligned with learning objectives.

This variation in scores highlights differences in the competencies possessed by male teacher candidates. Some categories show lower scores compared to others, suggesting that certain aspects still require improvement and further development. For instance, the low score in the Developing (DE) category indicates that male teacher candidates may face challenges in designing and developing effective and relevant assessment tools tailored to learning objectives.

On the other hand, female teacher candidates demonstrate higher average scores than their male counterparts in most categories. The highest score for female candidates was recorded in the RE (Reflecting) category, with a value of 62.7%, indicating their stronger ability to reflect on and evaluate assessment outcomes for future learning improvements.

Overall, female candidates exhibit more consistent and higher scores across nearly all categories. This may indicate that female teacher candidates excel in various aspects of assessment literacy, such as planning, implementation, and evaluation. The differences in scores could also reflect variations in how male and female candidates prepare and develop their competencies as future educators.

In the overall analysis of LADCG scores, demographic factors specifically gender appear to influence assessment literacy levels. This suggests that gender may play a significant role in shaping prospective teachers' online assessment literacy. To evaluate the significance of these differences based on demographic factors and measurement dimensions, a non-parametric hypothesis test was conducted. The Mann-Whitney U test was used to analyze gender-based differences, providing further insights into the impact of gender on online assessment literacy competencies among prospective teachers.

Table 5. Mann-Whitney U Test Results

Demographist	Significance (p)							
	CH	**DE**	**AD**	**UD**	**UG**	**CO**	**RE**	**LADCG**
Gender	0.899	0.596	0.471	0.593	0.315	0.378	0.290	0.400

The non-parametric test presented in the table above reveals interesting findings regarding online assessment literacy (LADCG) based on gender. According to the test results, the p-value (significance) obtained for all tested dimensions is greater than 0.05 (p > 0.05). This indicates that there is no significant difference in online assessment literacy between male and female teacher candidates. The tested dimensions include Choosing (CH), Developing (DE), Administering (AD), Using-Decision (UD), Using-Grading (UG), Communicating (CO), and Recognizing Ethics (RE), along with the overall LADCG score. The p-values for each dimension are as follows: Choosing (CH) = 0.899, Developing (DE) = 0.596, Administering (AD) = 0.471, Using-Decision (UD) = 0.593, Using-Grading (UG) = 0.315, Communicating (CO) = 0.378, Recognizing Ethics (RE) = 0.290, and the overall LADCG score = 0.400.

All obtained p-values exceed 0.05, confirming that there is no significant difference between male and female teacher candidates in any dimension of online assessment literacy or in the total LADCG score. In other words, both male and female teacher candidates demonstrate similar levels of online assessment literacy across all measured aspects. These results suggest that gender does not have a significant influence on online assessment competencies among prospective English teachers. Although the previous descriptive analysis indicated differences in average scores between male and female candidates, this statistical test confirms that these differences are not statistically significant enough to conclude a gender-based gap.

Since no significant difference was found, it can be concluded that competencies in Choosing, Developing, Administering, Using-Decision, Using-Grading, Communicating, and Recognizing Ethics in online assessment are equivalent between male and female teacher candidates. Additionally, these findings suggest that the English Education program has successfully provided equal learning opportunities for all students, regardless of gender. The slight variations in average scores observed earlier are more likely due to individual factors rather than gender-related influences.

These findings have important implications for curriculum development and online assessment literacy training. Given that no significant gender-based differences were found, training programs can focus on enhancing overall competencies without the need for gender-specific approaches. Overall, this non-parametric test provides deeper insights into the relationship between gender and online assessment literacy among prospective English teachers. By confirming the absence of significant differences, this study reinforces the argument that online assessment competencies are more influenced by factors such as experience, pedagogical understanding, and technological skills rather than gender. Based on the tables presented above, there is a noticeable difference in the average scores and levels of online assessment literacy based on gender. The first step in determining whether this difference is statistically significant is to analyze the data distribution. Therefore, a normality test is conducted to assess whether the average scores and levels of online assessment literacy between male and female students are normally distributed. The results of this test are crucial in determining the appropriate statistical analysis method to be used.

If the normality test indicates that the data is normally distributed, a parametric test can be applied. Conversely, if the data is found to be non-normally distributed, a non-parametric test must be used to examine the significance of the difference. The results of the normality test are presented in the table below. Based on the results of the Kolmogorov-Smirnov normality test, the significance value for LADCG is 0.2, which exceeds the threshold or minimum value for data to be considered normally distributed (i.e., >0.05). This indicates that LADCG is normally distributed. Meanwhile, the significance value for Gender_12 is 0.000, which is below 0.05, suggesting that the Gender_12 data is not normally distributed. Since the LADCG data meets the normality assumption (>0.05), a parametric test can be used to analyze differences related to LADCG. However, because the Gender_12 data does not meet this assumption (≤0.05), a non-parametric test is more appropriate

for analyzing this data. An independent sample t-test was conducted to compare LADCG scores between the two groups. The purpose of this test is to determine whether there is a statistically significant difference in LADCG scores between the groups. The first step in verifying the equality assumption is to perform Levene's test.

A t-test was conducted to determine whether there is a significant difference in LADCG scores between the two groups. The findings from the t-test show a t-value of 0.898 with (df) 71 and a significance value (2-tailed) of 0.372. Since the p-value is greater than 0.05, this indicates that there is no statistically significant difference in LADCG scores between the two groups. This suggests that any observed differences in average LADCG scores are likely due to chance rather than the tested factor. These findings confirm that there is no meaningful difference in LADCG between the two groups, leading to the conclusion that the group variable does not significantly influence LADCG scores.

4. Discussions

The results of this study indicate that the majority of sixth-semester prospective teachers in the English Language Education Program at Undiksha have a moderate level of online assessment literacy. This finding suggests that while they have acquired a basic understanding of technology-based assessments, they still struggle with technical aspects such as assessment validity, reliability, and digital assessment instrument design.

This study aligns with the findings of (Dewi et al., 2024), which revealed that English as a Foreign Language (EFL) teachers in Denpasar also exhibited a fair level of online assessment literacy. Their study highlighted the importance of professional development in enhancing teachers' understanding of assessment validity and improving test design to better suit students' needs. This suggests that although online assessment is increasingly integrated into education, there remains a gap in educators' preparedness to adopt technology-based assessment methods. Furthermore, these findings are consistent with (Xu et al., 2024), who found that assessment literacy is heavily influenced by social context and professional experience. They emphasized that all educators, whether at the school or university level, need a strong understanding of assessment to enhance the quality of learning evaluation. A high level of assessment literacy enables teachers to tailor their teaching strategies to students' needs, thereby improving learning effectiveness. This is also supported (Mutiah, 2023), who stressed that guidance from lecturers or instructors is crucial in helping students gain a better understanding of how to integrate technology into assessments.

Additionally, Gyamfi et al., (2023) found that assessment literacy among instructors is generally classified as fair, indicating the need for improvement in how educators design and implement assessments. They recommended two key strategies to enhance teachers' assessment literacy: (1) centralizing assessment applications and (2) implementing backward planning in lesson plan development. Similarly, Seddik (2023) emphasized that teachers' assessment literacy plays a crucial role in determining the effectiveness of learning, as it helps educators identify students' strengths and weaknesses while also providing deeper insights into the learning acquisition process. Another study by Pambudi and Windasari (2022) found that the low level of online assessment literacy among prospective teachers is primarily due to limited training and direct experience in evaluating students. Their research showed that a lack of opportunities for practical assessment experience, such as designing test items, conducting evaluations, and understanding scoring and grading techniques, is a major factor contributing to this issue.

This study also analyzed gender-based differences in online assessment literacy using parametric tests. The results indicate that there is no significant difference between male and female students in their level of online assessment literacy. This is further supported by the average scores, where female students scored 55.6%, slightly higher than male students at 53.3%. However, some

studies present contradictory findings. For instance, (J. Xu et al., 2024) reported that in EFL learning, female students tend to outperform male students. Another study by (Putro et al., 2022) revealed that in online English learning, there was no significant difference between male and female learners, regardless of their proficiency levels. While some research suggests that gender differences exist in academic performance, this study reinforces the idea that other factors—such as learning strategies, motivation, cultural background, and educational environment—play a more significant role in shaping online assessment literacy (Dewi et al., 2024). This is consistent with Ratnasari et al., (2024) who emphasized that assessment competency is more influenced by training quality and professional experience rather than biological factors like gender.

Based on these findings, a more systematic approach is required to enhance online assessment literacy among prospective teachers. This study suggests that intensive training and professional development programs should be implemented to improve their understanding of technology-based assessments. (Susrini et al., 2022) recommend that seminars, workshops, and additional courses on digital assessment can serve as effective solutions for improving teachers' skills in this area. Moreover, (Nguyen & Habók, 2024) argue that investing in assessment literacy development can help teachers become more effective in evaluating student progress and providing constructive feedback. Similarly, (Blažević & Bošnjak Terzić, 2017) state that a strong understanding of assessment principles enhances student engagement and helps create a more inclusive and supportive academic environment. Thus, a holistic approach is needed to ensure that prospective teachers at Undiksha develop optimal online assessment literacy. This includes experience-based training, further research on the factors influencing assessment literacy, and the continuous development of professional training programs. These findings provide a strong foundation for educational institutions, policymakers, and researchers to refine their strategies in enhancing online assessment literacy, ultimately leading to higher-quality teaching and learning outcomes in the digital era.

5. Conclusion and Suggestion

The results of this study indicate that the level of online assessment literacy among sixth-semester students in the English Language Education Study Program at Undiksha falls into the moderate category. Although some students have a basic understanding of online assessment, there are still limitations in effectively applying assessment concepts. Therefore, structured, and continuous training is necessary to enhance their competencies. Furthermore, the analysis results show no significant differences in online assessment literacy based on gender. This indicates that both male and female students have relatively equal levels of understanding regarding online assessment. These findings also support previous studies suggesting that gender does not directly influence the level of comprehension in online assessment literacy. Moreover, this study highlights that online assessment literacy is not only a technical skill but also involves prospective teachers' ability to design, implement, and evaluate assessments effectively. A better understanding of online assessment will help future educators create more accurate evaluations and provide meaningful feedback to students. Therefore, improving online assessment literacy not only contributes to enhancing teaching quality but also supports a more adaptive and responsive learning experience in the digital era.

This study recommends that prospective teachers, lecturers, and future researchers take specific actions to enhance online assessment literacy. Sixth-semester students in the English Language Education Study Program at Undiksha should develop their technological literacy by participating in seminars and assessment courses to improve their competency in online assessments. Lecturers should provide better support by offering specialized training, seminars, and learning materials to strengthen students' understanding of digital assessment strategies.

Additionally, future researchers should address the study's demographic imbalances by selecting a more balanced sample of students, including those who have and have not taken assessment courses or internships, to improve data validity and gain deeper insights into the factors affecting prospective teachers' online assessment literacy.

References

Abduraimova, Z. . (2024). Prospective English language teachers' self-efficacy beliefs in English language teaching environment. *Bulletin of the Karaganda University Pedagogy Series*, *11329*(1), 114–122. https://doi.org/10.31489/2024ped1/114-122

Adiguna, I. W. B., Dewi, N. L. P. E. S., Paramartha, A. A. G. Y., & Wahyuni, L. G. E. (2023). Teacher's Perception of Self-Assessment in English Writing Competency for Junior High School Students. *Jurnal Pendidikan Bahasa Inggris Undiksha*, *11*(1), 104–112. https://doi.org/10.23887/jpbi.v11i1.64935

Aghabarari, M., & Rahimi, M. (2020). EFL Teachers' Conceptions of Professional Development during the Practicum: Retrospective Perceptions and Prospective Insights. *Asian-Pacific Journal of Second and Foreign Language Education*, *5*. https://doi.org/10.1186/s40862-020-00084-0

Aglazor, G. (2017). The role of teaching practice in teacher education programmes: designing framework for best practice. *Global Journal of Educational Research*, *16*, 101. https://doi.org/10.4314/gjedr.v16i2.4

Ahmed, M., & Sidiq, M. (2023). *Evaluating Online Assessment Strategies: A Systematic Review of Reliability and Validity in E- Learning Environments*. *6*, 1–18. https://doi.org/10.5281/zenodo.10407361

Alharbi, M., & Alzahrani, M. (2020). The Importance of Learning Through Play in Early Childhood Education: Reflection on The Bold Beginnings Report. *International Journal of Whole Person Care*, *Volume 5*, 9–17.

Ali, N. (2024). *Assessment Literacy for Educators: Understanding, Implementing, and Utilizing Assessment Tools*. https://doi.org/10.13140/RG.2.2.11672.78086

Alofi, R. A., & Almalki, M. S. (2022). Conceptualizing Communicative Language Teaching (CLT) in the EFL Context: Ethnographic Experiences of CELTA and Non-CELTA Holders. *English Language Teaching*, *15*(5), 14. https://doi.org/10.5539/elt.v15n5p14

Amador, J. M., Bragelman, J., & Superfine, A. C. (2021). Prospective teachers' noticing: A literature review of methodological approaches to support and analyze noticing. *Teaching and Teacher Education*, *99*. https://doi.org/10.1016/j.tate.2020.103256

Andrade, C. (2020). Understanding the Difference Between Standard Deviation and Standard Error of the Mean, and Knowing When to Use Which. *Indian Journal of Psychological Medicine*, *42*(4), 409–410. https://doi.org/10.1177/0253717620933419

Anis, D. (2024). Teacher Professional Development in the Digital Age: Addressing the Evolving Needs Post- COVID. *International Journal For Multidisciplinary Research*, *6*, 1–14. https://doi.org/10.36948/ijfmr.2024.v06i01.12386

Anthony, G., Hunter, J., & Hunter, R. (2015). Prospective teachers development of adaptive expertise. *Teaching and Teacher Education*, *49*, 108–117. https://doi.org/https://doi.org/10.1016/j.tate.2015.03.010

Asiamah, N., Mensah, H. K., & Oteng-Abayie, E. F. (2017). General, Target, and Accessible Population: Demystifying the Concepts for Effective Sampling. *Qualitative Report*, *22*, 1607–1622. https://doi.org/10.46743/2160-3715/2017.2674

Authors. (2023). *Global EdTech Market Outlook & Forecast Report 2023: A $695+ Billion Market by 2028 - Learning Management Systems (LMS) Dominate EdTech, Enhancing Learning*

Worldwide. Globenewswire.Com. https://www.globenewswire.com/en/news-release/2023/10/13/2759843/28124/en/Global-EdTech-Market-Outlook-Forecast-Report-2023-A-695-Billion-Market-by-2028-Learning-Management-Systems-LMS-Dominate-EdTech-Enhancing-Learning-Worldwide.html

Bhandari, P. (2023). *How to Calculate Variance | Calculator, Analysis & Examples*. Scribbr.Com. https://www.scribbr.com/statistics/variance/

Bhat, A. (2024). *Data Analysis in Research: Types & Methods*. Questionpro.Com. https://www.questionpro.com/blog/data-analysis-in-research/

Blažević, A. G., & Bošnjak Terzić, B. (2017). Information Literacy of Croatian Language Teacher Pre-Service Trainees and Their Attitudes Towards Educating Their Future Language Students About Information Literacy. *Metodički Obzori/Methodological Horizons*, *12*(1), 37–53. https://doi.org/10.32728/mo.12.1.2017.03

Chander, S., & Arora, C. (2021). *Integrating Technology into Classroom Learning. Indian Jou*.

Chang, A. N., & Suparmi, S. (2020). The Implementation of Communicative Language Teaching (CLT) and Factors Hindering Teachers from Implementing it in High School. *Al-TA'DIB: Jurnal Kajian Ilmu Kependidikan*, *13*(1), 46. https://doi.org/10.31332/atdbwv13i1.1598

Collie, R. J., & Martin, A. J. (2016). Adaptability: An important capacity for effective teachers. *Educational Practice and Theory*, *38*(1), 27–39. https://doi.org/10.7459/ept/38.1.03

Corres, A., Ruiz-Mallén, I., & Rieckmann, M. (2024). Educators' competences, motivations and teaching challenges faced in education for sustainable development: what are the interlinkages? *Cogent Education*, *11*. https://doi.org/10.1080/2331186X.2024.2302408

Dewi, G. P. R., Santosa, M. H., Dewi, N. L. P. E. S., & Nitiasih, P. K. (2023). Assessing students' writing skills in virtual classroom: strategies and challenges in EFL context. *Journal on English as a Foreign Language*, *13*(1), 147–170. https://doi.org/10.23971/jefl.v13i1.5288

Dewi, K. A. K., Artini, L. P., & Wahyuni, L. G. E. (2024). Bridging the Gap: a Qualitative Analysis of Gendered Perceptions on Good and Effective English Teacher. *Jurnal JOEPALLT (Journal of English Pedagogy, Linguistics, Literature, and Teaching)*, *12*(1), 119. https://doi.org/10.35194/jj.v12i1.3976

Dube, M., Masengu, R., Sibanda, S., & Mandongwe, L. (2023). Chapter 7 - Assessment: higher education institutions' innovative online assessment methods beyond the era of the COVID-19 pandemic. In U. G. Singh, C. S. Nair, & S. Gonçalves (Eds.), *Digital Teaching, Learning and Assessment* (pp. 121–146). Chandos Publishing. https://doi.org/https://doi.org/10.1016/B978-0-323-95500-3.00010-9

Eden, C., & Adeniyi, I. (2024). Cultural Competence In Education: Strategies For Fostering Inclusivity And Diversity Awareness. *International Journal of Applied Research in Social Sciences*, *6*, 383–392. https://doi.org/10.51594/ijarss.v6i3.895

Elhussien, F. A., & Khalil, S. M. (2023). Examining Language Assessment Literacy for Saudi Pre-service EFL Teachers. *World Journal of English Language*, *13*(6), 431–438. https://doi.org/10.5430/wjel.v13n6p431

Ernawati, R. (2021). Analisis Pengaruh Promosi, Harga, dan Citra Merek terhadap Keputusan Pembelian pada Situs E-commerce Zalora di Jakarta. *Business Management Analysis Journal (BMAJ)*, *4*(2), 80–98. https://doi.org/10.24176/bmaj.v4i2.6663

Estaji, M., Banitalebi, Z., & Brown, G. T. L. (2024). The key competencies and components of teacher assessment literacy in digital environments: A scoping review. *Teaching and Teacher Education*, *141*, 104497. https://doi.org/https://doi.org/10.1016/j.tate.2024.104497

Faloye, S., & Faniran, V. (2023). Integrating technology in teaching and learning practices: students' competencies. *South African Computer Journal*, 14. https://doi.org/10.18489/sacj.v35i1.1111

Farmasari, S., Wardana, L. A., Baharudin, Herayana, D., & Suryaningsih, H. (2023). Pre-service EFL Teachers' Language Assessment Literacy Satisfaction and Assessment Preparedness. *International Journal of Language Education*, *7*(4), 646–660. https://doi.org/10.26858/ijole.v7i4.47445

Franklin, H., & Harrington, I. (2019). A Review into Effective Classroom Management and Strategies for Student Engagement: Teacher and Student Roles in Today's Classrooms. *Journal of Education and Training Studies*, *7*(12), 1. https://doi.org/10.11114/jets.v7i12.4491

Gaikwad, D. S., Wadegaonkar, A., Mitra, G., & Chakravarty, D. (2023). Assessment Literacy, Current Assessment Practices and Future Training: Reflections of Teachers in Higher Education. *International Journal of Learning, Teaching and Educational Research*, *22*, 1–29. https://doi.org/10.26803/ijlter.22.7.1

Gyamfi, A., Langee, P., Yeboah, A., & Adu Aboagye, I. (2023). Performance-Based Assessment in Contemporary Classroom Assessment: The Forms and Nature. *Asian Research Journal of Arts & Social Sciences*, *19*, 1–7. https://doi.org/10.9734/ARJASS/2023/v19i4431

Haleem, A., Javaid, M., Qadri, M. A., & Suman, R. (2022). Understanding the role of digital technologies in education: A review. *Sustainable Operations and Computers*, *3*, 275–285. https://doi.org/https://doi.org/10.1016/j.susoc.2022.05.004

Hassan, M. (2024). *Descriptive Statistics – Types, Methods and Examples*. Researchmethod.Net. https://researchmethod.net/descriptive-statistics/

Heil, J., & Ifenthaler, D. (2023). Online Assessment in Higher Education: A Systematic Review. *Online Learning*, *27*. https://doi.org/10.24059/olj.v27i1.3398

Hossan, D., Mansor, Z., & Jaharuddin, N. (2023). Research Population and Sampling in Quantitative Study. *International Journal of Business and Technopreneurship (IJBT)*, *13*, 209–222. https://doi.org/10.58915/ijbt.v13i3.263

Husain, F. N. (2021a). Digital Assessment Literacy: The Need of Online Assessment Literacy and Online Assessment Literate Educators. *International Education Studies*, *14*(10), 65. https://doi.org/10.5539/ies.v14n10p65

Husain, F. N. (2021b). Digital Assessment Literacy: The Need of Online Assessment Literacy and Online Assessment Literate Educators. *International Education Studies*, *14*(10), 65. https://doi.org/10.5539/ies.v14n10p65

Irungu, M. N. (2019). To examine the Influence of Gender Interaction on Academic Achievement of learners. *Advances in Social Sciences Research Journal*, *6*(7), 126–143. https://doi.org/10.14738/assrj.67.6761

Joshi, A., Virk, A., Saiyad, S., Mahajan, R., & Singh, T. (2020). Online assessment: Concept and applications. *Journal of Research in Medical Education & Ethics*, *10*(2), 49. https://doi.org/10.5958/2231-6728.2020.00015.3

Kavenuke, P. S., Kinyota, M., & Kayombo, J. J. (2020). The critical thinking skills of prospective teachers: Investigating their systematicity, self-confidence and scepticism. *Thinking Skills and Creativity*, *37*, 100677. https://doi.org/10.1016/j.tsc.2020.100677

Kuphanga, D. (2024). *Questionnaires in Research: Their Role, Advantages, and Main Aspects*. https://doi.org/10.13140/RG.2.2.15334.64325

Lupascu, A. R., Pânisoară, G., & Pânisoară, I.-O. (2014). Characteristics of Effective Teacher. *Procedia - Social and Behavioral Sciences*, *127*, 534–538. https://doi.org/10.1016/j.sbspro.2014.03.305

Marín, V., & Castañeda, L. (2023). *Developing Digital Literacy for Teaching and Learning* (pp. 1089–1108). https://doi.org/10.1007/978-981-19-2080-6_64

Mohajan, H. (2017). Two Criteria for Good Measurements in Research: Validity and Reliability. *Annals of Spiru Harat Universit*, *17*, 59–82. https://doi.org/10.26458/1746

Mohajan, H. (2021). Quantitative Research: A Successful Investigation in Natural and Social Sciences. *Journal of Economic Development, Environment and People*, *9*. https://doi.org/10.26458/jedep.v9i4.679

Mufanti, R., Carter, D., & England, N. (2024). Outcomes-based education in Indonesian higher education: Reporting on the understanding, challenges, and support available to teachers. *Social Sciences & Humanities Open*, *9*, 100873. https://doi.org/https://doi.org/10.1016/j.ssaho.2024.100873

Musa, S., Suherman, A., Sujarwo, S., & Nurhayati, S. (2024). Continuous professional growth: A study of educators' commitment to lifelong learning. *Jurnal Cakrawala Pendidikan*, *43*. https://doi.org/10.21831/cp.v43i2.66654

Mutiah, S. D. (2023). *English Teachers ' Assessment Literacy and Online Formative Assessment Implementation in Teaching Writing*.

Nguyen, L. A. T., & Habók, A. (2024). Tools for assessing teacher digital literacy: a review. In *Journal of Computers in Education* (Vol. 11, Issue 1). Springer Berlin Heidelberg. https://doi.org/10.1007/s40692-022-00257-5

Nickerson, C. (2023). *Content Validity: Definition & Examples*. Simplypsychology.Org. https://www.simplypsychology.org/content-validity-in-research-definition-examples.html

Oberländer, M., Beinicke, A., & Bipp, T. (2020). Digital competencies: A review of the literature and applications in the workplace. *Computers & Education*, *146*, 103752. https://doi.org/10.1016/j.compedu.2019.103752

Oktarini, W. (2022). Students Perception on the Online Learning: a Case Study of Efl Learners. *Edulingua: Jurnal Linguistiks Terapan Dan Pendidikan Bahasa Inggris*, *8*(2), 65–72. https://doi.org/10.34001/edulingua.v8i2.2033

Oo, C. Z., Alonzo, D., & Asih, R. (2022). Acquisition of teacher assessment literacy by pre-service teachers: A review of practices and program designs. *Issues in Educational Research*, *32*(1), 357–373.

Pambudi, M. A., & Windasari. (2022). Strategi Guru dalam Meningkatkan Literasi Digital pada Siswa. *Jurnal Inspirasi Manajemen Pendidikan*, *10*(3), 636–646.

Pastore, S. (2023). Teacher assessment literacy: a systematic review. *Frontiers in Education*, *8*. https://doi.org/10.3389/feduc.2023.1217167

Pribadi, F. A., & Setijaningrum, E. (2023). Analisis Prinsip Pembiayaan Kesehatan dalam Mendukung Cakupan Kesehatan Semesta di Indonesia. *Jejaring Administrasi Publik*, *15*(2), 60–78. https://doi.org/10.20473/jap.v15i2.49582

Putro, N. H. P. S., Damio, S. M., Sukarno, & Purnawan, A. (2022). Pre-Service Teachers Literacy of Assessment for Learning. *Asian Journal of University Education*, *18*(3), 792–802. https://doi.org/10.24191/ajue.v18i3.18984

Pyzdek, T. (2021). Descriptive Statistics. *Management for Professionals*, *Part F458*, 145–149. https://doi.org/10.1007/978-3-030-69901-7_12

Ramirez, I. A. (2021). *Teaching Preparedness of Pre-Service Teachers: Perception to Practice*.

Ratnasari, D., Artini, L. P., & Wahyuni, L. G. E. (2024). Gender Differences in Perceiving the Values of Good and Effective English Teacher. *Jurnal JOEPALLT (Journal of English Pedagogy, Linguistics, Literature, and Teaching)*, *12*(1), 45. https://doi.org/10.35194/jj.v12i1.3868

Sanjaya, I. A. R., Suprianti, G. A. P., & Paramartha, A. A. G. Y. (2023). The Implementation of Quizziz as Assessment for Learning in English as A Foreign Language: The Teacher's Perspective. *The Art of Teaching English as a Foreign Language*, *4*(2), 50–59. https://doi.org/10.36663/tatefl.v4i2.628

Sarfo, J. O., Debrah, T., Gbordzoe, N., & Obeng, P. (2022). Types of Sampling Methods in Human

Research: Why, When and How? *European Researcher*, *13*, 55–63. https://doi.org/10.13187/er.2022.2.55

Seddik, M. E. (2023). *Journal of English Language Teaching and Applied Linguistics Error Analysis in EFL Students' Writing Skill*. *2018*, 163–172. https://doi.org/10.32996/jeltal

Setiawan, A. (2017). *Analisis Data Statistik*. https://www.researchgate.net/publication/320372456_ANALISIS_DATA_STATISTIK

Soodmand Afshar, H., Tofighi, S., Asoodeh, M., & Ranjbar, N. (2018). The impact of alternative assessment knowledge, teaching experience, gender, and academic degree on EAP teachers' assessment literacy. *Iranian Journal of English for Academic Purposes*, *7*(2), 1–15. https://journalscmu.sinaweb.net/article_87251.html%0Ahttps://journalscmu.sinaweb.net/article_87251_6db56806df6d4edfd9b874f13cbc8511.pdf

Sürücü, L., & Maslakci, A. (2020). *Validity and Reliability in Quantitative Research*. *8*, 2694–2726. https://doi.org/10.15295/bmij.v8i3.1540

Susrini, P., Paramartha, A. A. G. Y., & Wahyuni, L. G. E. (2022). Assessment Literacy Level of EFL Teachers in Buleleng: A Descriptive Study. *The Art of Teaching English as a Foreign Language*, *3*(2), 104–110. https://doi.org/10.36663/tatefl.v3i2.303

Taherdoost, H. (2016). Sampling Methods in Research Methodology; How to Choose a Sampling Technique for Research. *International Journal of Academic Research in Management*, *5*, 18–27. https://doi.org/10.2139/ssrn.3205035

Tarman, B. (2012). Prospective Teachers' Beliefs and Perceptions about Teaching as a Profession. *Educational Sciences: Theory and Practice*, *12*, 1–24.

Tekyi-Arhin, O. (2023). *The Importance Of Play-Based Learning In Early Childhood Education By Oliver Tekyi-Arhin*. https://doi.org/10.13140/RG.2.2.35564.64643

Tierney, R. (2016). *Fairness in Educational Assessment*. https://doi.org/10.1007/978-981-287-532-7_400-1

Topuz, A. C., Saka, E., Fatsa, Ö. F., & Kurşun, E. (2022). Emerging trends of online assessment systems in the emergency remote teaching period. *Smart Learning Environments*, *9*(1). https://doi.org/10.1186/s40561-022-00199-6

Ventista, O. M., & Brown, C. (2023). Teachers' professional learning and its impact on students' learning outcomes: Findings from a systematic review. *Social Sciences & Humanities Open*, *8*(1), 100565. https://doi.org/10.1016/j.ssaho.2023.100565

Xie, Q. (2021). Developing preservice English teachers' assessment literacy through design-based research. *Journal of Education for Teaching*, *47*(3), 460–465. https://doi.org/10.1080/02607476.2021.1906155

Xu, J., Zhang, S., & Chen, H. (2024). The impact of teacher autonomy support on students' assessment literacy: The chain mediating effects of self-efficacy and critical reflection. *Heliyon*, *10*(14), e34616. https://doi.org/https://doi.org/10.1016/j.heliyon.2024.e34616

Xu, Y., & Brown, G. T. L. (2016). Teacher assessment literacy in practice: A reconceptualization. *Teaching and Teacher Education*, *58*, 149–162. https://doi.org/https://doi.org/10.1016/j.tate.2016.05.010

Yu, C., & Xu, W. (2024). Writing assessment literacy and its impact on the learning of writing: A netnography focusing on Duolingo English Test examinees. *Language Testing in Asia*, *14*(1). https://doi.org/10.1186/s40468-024-00297-x

Zhang, X., Sazalli, N. A. H., & Nadjwa, M. N. (2024). Improving Teachers' Digital Competence in Higher Education: A Systematic Literature Review. *International Journal of Academic Research in Progressive Education and Development*, *13*(1). https://doi.org/10.6007/IJARPED/v13-i1/20560