

THE USE OF SMART BOX MEDIA IN TEACHING SYNONYMS AND ANTONYMS TO IMPROVE STUDENTS' VOCABULARY AT SMA KRISTEN 1 KUPANG

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Abstract. This study aimed to enhance vocabulary mastery in teaching synonyms and antonyms using smart box media among eleventh-grade students at SMA Kristen 1 Kupang. Employing a classroom experimental design, researchers conducted pre-tests, applied treatment using smart box media, and followed up with post-tests to evaluate outcomes. Quantitative analysis of the scores revealed significant improvement, substantiating the efficacy of the intervention. Initially, students in the experimental class scored a cumulative 790 in the pre-test. After implementing smart box media, their total post-test score increased to 1300, marking a 64% improvement. The calculation used for these scores involved dividing the number of correct responses by the total number of questions, multiplying by 100, and summing all individual scores. The overall percentage increase was derived using a formula where the difference between the final and initial results was divided by the initial score and multiplied by 100. These results indicate that smart box media is a powerful tool for enhancing vocabulary acquisition. The significant score increases highlights that integrating innovative teaching aids can substantially boost student engagement and learning effectiveness. Thus, the study concludes that the use of smart box media in teaching vocabulary, particularly synonyms and antonyms, is highly effective and beneficial for eleventh-grade students at SMA Kristen 1 Kupang, offering a promising approach for vocabulary instruction in similar educational contexts.

Keywords: Antonym, smart box, synonym, vocabulary



INTRODUCTION

Vocabulary acquisition is widely recognized as a crucial component of language learning, essential for effective communication and comprehension. The richness of a student's vocabulary greatly influences their academic success and ability to express ideas clearly and understand complex texts. Studies have shown that vocabulary depth, which includes the understanding of synonyms and antonyms, contributes significantly to the quality of text produced by students, indicating that a more nuanced vocabulary enhances both comprehension and expression in academic contexts (Alonso-Cortés-Fradejas et al., 2021; Hasannejad et al., 2014). Furthermore, the ability to utilize synonyms and antonyms allows learners to refine their language use, increasing precision and enabling them to grasp subtle differences in meaning, which is essential for effective communication (Hàng & Du, 2021). However, despite the importance of vocabulary, many high school students continue to face significant challenges in this area. Research indicates that traditional instructional methods often fall short in effectively teaching vocabulary, leading to persistent issues in vocabulary retention and usage among students (Alghamdi & Ahmed, 2018; Jannah et al., 2023). For instance, in many educational settings, vocabulary instruction tends to rely heavily on rote

memorization and passive learning strategies, which do not adequately engage students or promote active vocabulary use (Alghamdi & Ahmed, 2018). This lack of engagement can hinder students' ability to develop a robust vocabulary, which is critical for their overall academic performance and language proficiency (Dujardin et al., 2021).

In language classrooms, the struggle to develop and retain an extensive vocabulary remains a persistent issue, often due to the limitations of traditional instructional methods. Studies have shown that innovative teaching strategies, such as the use of glosses or interactive methods, can significantly enhance vocabulary acquisition and retention (X. Wang, 2022). Moreover, the integration of techniques that encourage active participation and contextual learning has been found to be more effective than conventional methods (Karbalaeei & Kord Afshari, 2019). This suggests that a shift towards more dynamic and engaging vocabulary instruction could help address the challenges faced by high school students in vocabulary acquisition, ultimately improving their language skills and academic outcomes (Hàng & Du, 2021; Hasannejad et al., 2014).

To address the existing gap in vocabulary teaching practices, recent studies have highlighted the need for incorporating interactive and student-centered approaches in the classroom. Research indicates that such methods can significantly enhance vocabulary acquisition among learners. For instance, Maulidya emphasizes the effectiveness of using games, such as Board Games, to create engaging learning experiences that facilitate vocabulary retention and make language learning enjoyable (Maulidya et al., 2023). Similarly, the use of interactive media, such as the Kahoot application, has been shown to improve vocabulary mastery among students, reinforcing the idea that technology can play a pivotal role in modern vocabulary instruction (Mansur & Fadhilawati, 2019; Nurfaizana, 2024). However, despite the promising results of these interactive methods, there remains a limited body of research specifically examining their effectiveness in teaching synonyms and antonyms. This gap underscores the necessity for further exploration into innovative instructional aids. The Smart Box media, as proposed in this study, aligns with the findings of Chai et al., who advocate for the integration of visual aids and interactive instruction to enhance vocabulary achievement (Chai et al., 2021). Moreover, the use of creative electronic media has been recognized as a beneficial approach for developing vocabulary memorization skills, suggesting that tailored media can cater to diverse learning preferences (Phupunna, 2023).

This study explores the use of Smart Box media as an instructional aid to engage students and facilitate vocabulary learning at SMA Kristen 1 Kupang. The incorporation of such media not only aims to address the existing gaps in vocabulary teaching practices but also seeks to provide a more interactive and effective learning environment. Research has shown that utilizing various media, including mobile applications and visual aids, can significantly enhance students' motivation and engagement in vocabulary learning (Badroeni et al., 2022; Setiawan & Wiedarti, 2020). Thus, the current study is positioned to contribute valuable insights into the effectiveness of Smart Box media in improving vocabulary skills, particularly in the context of teaching synonyms and antonyms.

METHOD

The method of this research involves a quantitative experimental design aimed at assessing the impact of Smart Box media on vocabulary acquisition among

eleventh-grade students at SMA Kristen 1 Kupang. The study uses pre-tests and post-tests to measure the improvement in understanding synonyms and antonyms, comparing an experimental class that used the Smart Box media with a control class that did not. The research was conducted at SMA Kristen 1 Kupang, involving 34 students divided into a science class (control group) and a social sciences class (experimental group). Data were collected using multiple-choice tests consisting of ten questions for both pre-tests and post-tests. The procedure included preparing learning materials, administering the pre-test, conducting lessons with and without the media, applying the Smart Box intervention in the experimental class, and finally, analyzing the data using statistical methods to determine the effectiveness of the Smart Box in enhancing students' vocabulary.

RESULT AND DISCUSSION

Result

The findings reveal that the use of Smart Box media had a significant impact on improving students' vocabulary in the experimental class compared to the control class. Therefore, the results indicated that the experimental class, which received instruction using Smart Box media, showed substantial improvement, with a 64% increase in vocabulary scores. In contrast, the control class, which did not use Smart Box media, displayed only minimal gains. The analysis confirmed that Smart Box media is an effective tool for enhancing vocabulary learning, supporting the hypothesis that innovative teaching aids can lead to better educational outcomes.

Table 1. Outcome of Control class (XI IPA)

No	Students	Score	
		Pre-test	Post-test
1	SL	30	40
2	HS	50	50
3	EP	70	80
4	WB	40	60
5	WYB	40	60
6	CSL	70	90
7	SN	20	40
8	JK	70	90
9	TSA	30	40
10	LRM	80	90
11	SAN	60	70
12	IMR	30	40
13	YM	40	50
14	UR	60	80
15	TL	60	80
16	ST	40	50
17	OT	60	70
18	NK	20	60
19	GN	70	70
Total : 19		940	1.220

Table 2. Outcome of Experiment class (XI IPA)

No	Students	Score	
		Pre-test	Post-test
1	BRK	20	80
2	DMAT	50	90
3	AA	70	90
4	RJF	20	80
5	DT	70	90
6	JT	50	90
7	SM	50	70
8	NB	60	80
9	MAT	60	90
10	DN	20	80
11	VET	60	90
12	SP	60	90
13	DP	60	100
14	CZ	80	90
15	HB	60	90
Total : 15		790	1.300

According to the pre-test and post-test results from the experimental class, as presented in the table, 15 students initially achieved a total pre-test score of 790, which increased to a total post-test score of 1,300. Prior to the intervention involving Smart Box media, students completed a ten-item multiple-choice pre-test focused on synonyms and antonyms, where the lowest score recorded was 20, and the highest was 80, achieved by a single student. Following the treatment using Smart Box media, the minimum score improved to 70, also by a single student, while the highest score increased to 100, attained by one student. Overall, the data indicate that students who received instruction with Smart Box media demonstrated a significantly higher improvement in scores compared to those in the control class.

After calculating the students' results, the subsequent step involves presenting the percentage distribution of students across five classifications: excellent, good, average, poor, and very poor.

Table 3. The Data Percentage of Students Pre-Test Scores

Classification	Frequency of Control Class	Percentage (%)	Frequency of Experimental Class	Percentage (%)
Excellent	0	0	0	0
Good	5	26%	3	20%
Average	5	26%	9	60%
Poor	7	37%	0	0
Very Poor	2	11%	3	20%
Total	19	100%	15	100%

The table shows that pre-test results from both the control and experimental classes were generally low. In the control class, 26% of students were categorized as good, 26% as average, 37% as poor, and 11% as very poor, with none achieving an

excellent rating. In the experimental class, 20% were categorized as good, 60% as average, and 20% as very poor. Percentages were calculated by dividing the frequency of each category by the total number of students and multiplying by 100.

After the treatment—where the control class did not use Smart Box media and the experimental class did—students completed a post-test to determine any improvements. The percentages of students' post-test performance are presented in the table below.

Table 4. The Data Percentage of Students Post-Test Scores

Classification	Frequency of Control Class	Percentage (%)	Frequency of Experimental Class	Percentage (%)
Excellent	3	16%	10	67%
Good	6	32%	5	33%
Average	5	26%	0	0
Poor	5	26%	0	0
Very Poor	0	0	0	0
Total	19	100%	15	100%

The table indicates that post-test results improved significantly in the experimental class, while there was also a noticeable increase in the control class. In the control class, 16% of students achieved an excellent score, 32% were categorized as good, 26% as average, and 26% as poor, with no students in the very poor category. In contrast, the experimental class showed remarkable results, with 67% of students categorized as excellent and 33% as good, leaving none in the lower categories. Percentages were calculated by dividing the frequency of each category by the total number of students and multiplying by 100. For example, in the control class, 32% of students were classified as good, while in the experimental class, 67% reached the excellent level. Using the formula:

$$\text{Percentage} = \frac{\text{Thefinalresult} - \text{Preliminaryresults}}{\text{Preliminaryresults}} \times 100\%$$

$$\text{Percentage} = \frac{1300-790}{790} \times 100\% = 64\%$$

The vocabulary improvement in the experimental class was calculated to be 64%, demonstrating the effectiveness of Smart Box media in teaching synonyms and antonyms.

Discussion

The results from this study indicate the effectiveness of Smart Box media in improving vocabulary, specifically in teaching synonyms and antonyms. The experimental class that used the Smart Box media exhibited a significant improvement in vocabulary scores, as opposed to the minimal gains observed in the control class. This substantial increase aligns with research on active and interactive learning methods, which highlight that incorporating engaging educational tools can significantly enhance students' language acquisition. For instance, Chen et al., (2023) discusses how digital technology in language education promotes attitudinal change and enhances learning through interactive cultural artifacts, which resonates with the findings of this study. Furthermore, Palanisamy emphasizes the importance of task-based language teaching (TBLT),

where communicative activities serve as the core of language learning, thereby supporting the notion that interactive tools like Smart Box media can facilitate meaningful language use and comprehension (Palanisamy & Rajasekaran, 2024).

The use of Smart Box media leverages these principles, providing a tactile and visual experience that traditional methods often lack. Research by Ningrum highlights the effectiveness of playful learning strategies, such as board games, in enhancing vocabulary acquisition among young learners, suggesting that interactive and engaging methods can lead to significant improvements in language skills (Ningrum et al., 2024). Additionally, Zhang's exploration of technology's role in language education underscores the transformative potential of digital tools in creating immersive learning environments that foster language acquisition (Zhang et al., 2024). This aligns with the findings of this study, as the Smart Box media not only engages students but also provides a dynamic platform for vocabulary enhancement, thereby addressing the limitations of conventional teaching methods.

Moreover, Smart Box media transforms vocabulary learning from a passive to an active process. Traditional vocabulary instruction, such as rote memorization, often fails to capture students' attention or foster long-term retention (Indriani et al., 2023). In contrast, the interactive nature of the Smart Box encourages students to actively engage with the material, making learning more meaningful and enjoyable. This aligns with findings that emphasize the importance of interactive strategies, such as the Vocabulary in Contexts and Repetitions (VCR) strategy, which promotes active involvement and motivation among learners (Indriani, 2023). Active engagement in the learning process is crucial for deep learning, as it allows students to apply their knowledge in various contexts and develop a more nuanced understanding of language (Gortaire et al., 2022). Research has shown that gamification and interactive learning environments significantly enhance vocabulary acquisition by fostering a sense of enjoyment and participation among students (Gortaire et al., 2022). Furthermore, the use of multimedia resources, such as videos and games, has been found to improve vocabulary retention and engagement, as they cater to diverse learning styles and preferences (Gortaire et al., 2022).

The significant improvements in the experimental class reflect the efficacy of using innovative instructional media to overcome common vocabulary learning barriers. For many high school students, synonyms and antonyms are challenging concepts that require repeated exposure and varied practice to master. The Smart Box media provides this repetition in an engaging and interactive format, making vocabulary learning less tedious and more effective. This is supported by research indicating that multimedia tools can enhance vocabulary acquisition by providing diverse and repeated exposure to target words, which is crucial for retention and understanding (Alquraishy & Mateab, 2021; Al-Sabbagh, 2023). Furthermore, the use of gamified learning environments has been shown to significantly increase student motivation and engagement, which are essential for effective vocabulary learning Hashemi (2021) & Robin & Aziz (2022) argues that incorporating technology and interactive elements in vocabulary teaching can greatly enhance student motivation and learning outcomes, aligning with findings that emphasize the positive impact of multimedia and interactive methods on vocabulary retention and student engagement (Ekinci & Ekinci, 2021; Fadzil & Sulaiman, 2022). Moreover, the integration of educational games and multimedia resources not only fosters a more enjoyable learning experience but also promotes active participation among

students, which is vital for mastering complex vocabulary concepts such as synonyms and antonyms (S. Wang & Lee, 2021). The interactive nature of these tools encourages students to engage with the material in a way that traditional methods may not, thereby facilitating deeper learning and retention (Kanellopoulou et al., 2019; Saleh & Ahmed Althaqafi, 2022). Research has consistently shown that when students are actively involved in their learning process through innovative media, their vocabulary acquisition improves significantly, as they are more likely to remember and apply new words effectively (Aravind & Rajasekaran, 2021; Fernando, 2022). Thus, the findings underscore the importance of utilizing modern instructional media to create a dynamic and effective vocabulary learning environment for high school students.

Furthermore, the absence of students in the lower performance categories (poor and very poor) in the experimental class underscores the media's ability to lift overall student performance. The use of Smart Box media appears to have leveled the playing field, enabling students who may have struggled with traditional methods to achieve better results. This is a promising finding, as it suggests that Smart Box media can be a valuable tool in addressing educational disparities and providing more equitable learning opportunities.

CONCLUSION

The findings from this study highlight the potential of Smart Box media to revolutionize vocabulary instruction. By making learning interactive, engaging, and multisensory, this media not only enhances vocabulary retention but also fosters a deeper understanding of synonyms and antonyms. As educational practices continue to evolve, the integration of such innovative tools should be considered a best practice for language educators, especially when dealing with abstract language concepts. This study contributes to the growing body of evidence supporting the use of technology and interactive learning aids in education, offering practical insights for future vocabulary instruction.

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REFERENCES

- Alghamdi, A. K. H., & Ahmed, S. Al. (2018). Effective Methods for Teaching English Vocabulary to Saudi Female Students. *Journal of Education and Learning (EduLearn)*, 12(1), 118–125. <https://doi.org/10.11591/edulearn.v12i1.9125>
- Alonso-Cortés-Fradejas, M. D., López-Aguado, M., & Llamazares-Prieto, M. T. (2021). Vocabulary depth and its contribution to text quality in the early years of primary school (*Profundidad de vocabulario y su contribución a la calidad textual en los primeros años de Educación Primaria*). *Journal for the Study of Education*

- and Development: Infancia y Aprendizaje*, 44(1), 82–116. <https://doi.org/10.1080/02103702.2020.1848087>
- Alquraishy, S. W., & Mateab, S. A. A. (2021). Vocabulary Acquisition Through Multimedia In An Iraqi EFL Context. *Psychology and Education Journal*, 58(1), 2492–2501. <https://doi.org/10.17762/pae.v58i1.1125>
- Al-Sabbagh, A. A.-G. (2023). Impact of Different Multimedia Modalities on Vocabulary Acquisition Among Second-Language English Learners: An Empirical Investigation. *العلوم التربوية*, 31(4), 1–27. <https://doi.org/10.21608/ssj.2023.323795>
- Aravind, B. R., & Rajasekaran, V. (2021). Exploring Dysphasia Learners' Vocabulary Acquisition through the Cognitive Theory of Multimedia Learning: An Experimental Study. *International Journal of Emerging Technologies in Learning (IJET)*, 16(12), 263–275. <https://doi.org/10.3991/ijet.v16i12.22173>
- Badroeni, B., Nasrulloh, S. F., & Suryaman, O. (2022). Mobile Learning Vocapp: (Vocabulary Application) for English Vocabulary Learning. *English Review: Journal of English Education*, 10(2), 533–542. <https://doi.org/10.25134/erjee.v10i2.6253>
- Chai, Z. F., Rosman, N. B., & Basri, M. F. Bin. (2021). Using Word Recognition Instruction and Visual Aids to Enhance Malaysian Primary ESL Learners' Vocabulary Achievement. *JETLe (Journal of English Language Teaching and Learning)*, 3(1), 28–39. <https://doi.org/10.18860/jetle.v3i1.13392>
- Chen, F., Gao, Y., & Wang, X. (2023). Exploring the role of TESOL and digital technology in attitudinal change and sustainable learning for students of higher education. *BMC Psychology*, 11(1), 320. <https://doi.org/10.1186/s40359-023-01372-3>
- Dujardin, E. P. A, Bailloud, N., Ecalle, J., & A. Magnan. (2021). Tools and Teaching Strategies for Vocabulary Assessment and Instruction: A Review. *Social Education Research*, 3(1), 34–66. <https://doi.org/10.37256/ser.3120221044>
- Ekinci, M., & Ekinci, E. (2021). Vocabulary Retention With Microsoft Teams: The Influence of Online Teaching on EFL Students' Vocabulary Achievement Levels. *International Journal of Language Academy*, 38(38), 13–23. <https://doi.org/10.29228/ijla.51669>
- Fernando, W. W. A. P. H. (2022). Effectiveness of Mobile Assisted Vocabulary Learning Applications (MAVL) as a self-learning tool for ESL learners in Sri Lanka. *Sri Lanka Journal of Social Sciences and Humanities*, 2(2), 69–77. <https://doi.org/10.4038/sljsssh.v2i2.74>
- Gortaire, D., Pérez, S., M. J., Romero R. E., & Mora, A. J. (2022). Case Study: Gamification as a strategy for vocabulary learning in university students. *Ciencia Latina Revista Científica Multidisciplinar*, 6(6), 7992–8005. https://doi.org/10.37811/cl_rcm.v6i6.3970
- Hàng, P. T., & Du, N. T. (2021). High School Students' Attitudes Towards the Use of A Synonym And Antonym Dictionary in Learning Vocabulary. *TNU Journal of Science and Technology*, 226(13), 109–117. <https://doi.org/10.34238/tnu-jst.5034>
- Hasannejad, M., Bahador, H., & Kazemi, S. (2014). Powerful Vocabulary Acquisition through Texts Comparison. *International Journal of Applied*

- Linguistics & English Literature*, 4(2), 213–220.
<https://doi.org/10.7575/aiac.ijalel.v.4n.2p.213>
- Hashemi, A. (2021). The effects of using games on teaching vocabulary in reading comprehension: a case of gifted students. *Journal for the Education of Gifted Young Scientists*, 9(2), 151–160. <https://doi.org/10.17478/jegys.846480>
- Indriani, S., Suteja, H., Listiani, T., & Seleky, J. S. (2023). Interactive Vocabulary Learning through VCR (Vocabulary in Contexts and Repetitions) Strategy. *Prosiding Konferensi Nasional Pengabdian Kepada Masyarakat Dan Corporate Social Responsibility (PKM-CSR)*, 6, 1–5. <https://doi.org/10.37695/pkmcscr.v6i0.2038>
- Jannah, A., Sujannah, W., & Emaliana, I. (2023, November 7). Shortcomings Faced by Senior High School Students during English Vocabulary Learning. *Proceedings of the 2nd International Conference on Advances in Humanities, Education and Language, ICEL 2022, 07–08 November 2022, Malang, Indonesia*. <https://doi.org/10.4108/eai.7-11-2022.2333897>
- Kanellopoulou, C., Kermanidis, K. L., & Giannakoulopoulos, A. (2019). The Dual-Coding and Multimedia Learning Theories: Film Subtitles as a Vocabulary Teaching Tool. *Education Sciences*, 9(3), 210. <https://doi.org/10.3390/educsci9030210>
- Karbalaei, A., & Kord Afshari, M. (2019). The Role of Innovative Concordancing Instruction Method in Improving Iranian EFL learners' Vocabulary. *International Journal of Research in English Education*, 4(3), 100–114. <https://doi.org/10.29252/ijree.4.3.100>
- Mansur, M., & Fadhilawati, D. (2019). Applying Kahoot to Improve the Senior High School Students' Vocabulary Achievement. *VELES Voices of English Language Education Society*, 3(2), 164–173. <https://doi.org/10.29408/veles.v3i2.1591>
- Maulidya, D. N., Imaniar, F., Safriani, A., Rakhmawati, R., & Jati, S. P. (2023). The Utilization of Instructional Media Used by Indonesian Pre-Service Teachers to Facilitate Student's English Vocabulary Learning: Thai Primary Students' EYL. *Linguistic, English Education and Art (LEEA) Journal*, 7(1), 172–183. <https://doi.org/10.31539/leea.v7i1.8295>
- Mohd Fadzil, N. I., & Sulaiman, N. A. (2022). Online Game-Based Learning Enhance ESL Learners' Vocabulary Learning: Benefits and Challenges. *International Journal of Academic Research in Progressive Education and Development*, 11(4), 769–778. <https://doi.org/10.6007/IJARPED/v11-i4/15634>
- Ningrum, N. K., Harisa, A. B., & Umaroh, L. (2024). Learning Through Play: Utilizing Board Games to Enhance English Vocabulary for Early Students. *TECHNO CREATIVE*, 1(2), 117–122. <https://doi.org/10.62411/tcv.v1i2.1784>
- Nurfaizana, D. R. (2024). Analysis of the Application of Drill and Practice: Improve Business Letter Writing Skills. *Jurnal Inspirasi Pendidikan*, 14(1), 30–39.
- Palanisamy, B., & Rajasekaran, V. (2024). Insights into the Dynamic Relationship between Technology and Task-Based Language Teaching: A Critical Review. *International Journal of Learning, Teaching and Educational Research*, 23(2), 402–420. <https://doi.org/10.26803/ijlter.23.2.19>

- Phupunna, S. (2023). Creative the Electronic Media Instructional Innovative Management Approach for Developing Chinese Vocabulary Memorization Skills of Educated Students in the Chinese Language. *Journal of Education and Learning*, 12(6), 132–138. <https://doi.org/10.5539/jel.v12n6p132>
- Robin, S. J., & Aziz, A. (2022). The Use of Digital Tools to Improve Vocabulary Acquisition. *International Journal of Academic Research in Business and Social Sciences*, 12(1), 2472–2492. <https://doi.org/10.6007/IJARBSS/v12-i1/12198>
- Saleh, A. M., & Ahmed Althaqafi, A. S. (2022). The Effect of Using Educational Games as a Tool in Teaching English Vocabulary to Arab Young Children: A Quasi-Experimental Study in a Kindergarten School in Saudi Arabia. *Sage Open*, 12(1). <https://doi.org/10.1177/21582440221079806>
- Setiawan, M. R., & Wiedarti, P. (2020). The effectiveness of Quizlet application towards students' motivation in learning vocabulary. *Studies in English Language and Education*, 7(1), 83–95. <https://doi.org/10.24815/siele.v7i1.15359>
- Wang, S., & Lee, C. I. (2021). Multimedia Gloss Presentation: Learners' Preference and the Effects on EFL Vocabulary Learning and Reading Comprehension. *Frontiers in Psychology*, 11. <https://doi.org/10.3389/fpsyg.2020.602520>
- Wang, X. (2022). The Role of Glosses in L2 Incidental Vocabulary Acquisition in Reading. *International Journal of Linguistics, Literature and Translation*, 5(10), 149–153. <https://doi.org/10.32996/ijllt.2022.5.10.17>
- Zhang, C., Liu, Z., B.R., A., & A, H. (2024). Synergizing language learning: SmallTalk AI In industry 4.0 and Education 4.0. *PeerJ Computer Science*, 10, e1843. <https://doi.org/10.7717/peerj-cs.1843>