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Language Learning Automation from University EFL Students' Perspective

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Abstract

Learners are increasingly eager to acquire knowledge more efficiently, grasp complex concepts, upgrade their skills, and prepare for future challenges. Artificial Intelligence (AI) can support this process by helping learners and educators maximize the effectiveness of their educational journey and engage in meaningful, relevant learning experiences. One effective approach is the use of automation. This research investigates language learning automation from the perspective of university EFL (English as a Foreign Language) students. A 15-item questionnaire was administered to a sample of 107 EFL students from the University of Baghdad, College of Education for Women, Department of English. Statistical analysis of the results revealed a generally positive attitude toward language learning automation, particularly in the use of audio and video materials that facilitate language acquisition. Based on the findings, recommendations and suggestions for future research are provided.

Keywords: Artificial Intelligence, English Language Teaching, Data-Driven Learning, Intelligent Tutoring Systems

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اجنبية لغة الانكليزية اللغة الدارسين الجامعة طلبة نظر وجهة من اللغة تعلم اتمتة

جياد عدنان انوار

اللغة الانكليزية تدريس طرائق دكتوراه

السياسية العلوم كلية /بغداد جامعة

الـمستـخلـص

يحرص المتعلمون على سرعة الحصول على المعرفة، واستيعاب المفاهيم المعقدة، وتطوير مهاراتهم، والاستعداد للتحديات المستقبلية. يستطيع الذكاء الاصطناعي (AI) تحقيق ذلك من خلال مساعدة المتعلمين ومعلميهم على تحقيق أقصى استفادة من تجربتهم التعليمية والمشاركة في تجارب تعليمية هادفة وذات صلة. وتعد الأتمتة إحدى الطرق الفعالة لتحقيق هذا الهدف. يهدف هذا البحث إلى دراسة أتمتة تعلم اللغة من وجهة نظر طلاب الجامعة الدارسين للغة الإنجليزية بوصفها لغة أجنبية، وذلك من خلال استبانة مكونة من 15 فقرة. تكونت العينة من 107 طالباً من قسم اللغة الإنجليزية في كلية التربية للبنات، جامعة بغداد. وقد أظهرت نتائج التحليل الإحصائي اتفاق الطلاب مع أتمتة تعلم اللغة، لاسيما فيما يتعلق باستخدام المواد الصوتية والمرئية التي تسهّل عملية تعلم اللغة. وبناءً على النتائج، تم تقديم توصيات ومقترحات لدراسات مستقبلية

1. INTRODUCTION

Artificial Intelligence (AI) is revolutionizing education by removing the constraints of time and space, thus enabling more flexible and accessible learning. This digital transformation is reshaping educational practices, with automation enhancing decision-making in professional environments through access to high-quality data (Selwyn et al., 2023, p.1).

AI and automation in education are emerging as essential tools for the future, positioning the learner as the central decision-maker. In EFL contexts, generative AI techniques facilitate automation by accommodating individual learning styles, strategies, and preferences (Agley, 2022, p.7).

The efficient, rapid, and accurate transmission of knowledge in English language classrooms is critical for academic and professional development. Automating educational processes supports learner-centered approaches, enabling students to personalize their learning experience and build data-driven programs with minimal human intervention (ibid, p.5).

Automation in language learning encompasses a variety of tools designed to enhance and personalize the educational experience. These include chatbots and AI tutors that offer real-time conversational practice, speech recognition software for improving pronunciation, automated translation and grammar correction tools to support language accuracy, and adaptive learning platforms that tailor lessons based on individual progress. Additionally, gamified applications and spaced repetition systems are employed to improve vocabulary retention. Overall, automation helps streamline the learning process, making it more efficient, accessible, and engaging for learners at different proficiency levels (Smutny & Schreiberova, 2020, p. 4).

1.2 Definition of Basic Terms

1.2.1 Automation in Language Learning

Automation in language learning refers to the use of technology, artificial intelligence, and automated systems to facilitate, enhance, and personalize the process of acquiring a new language. It encompasses a wide range of tools such as chatbots and AI tutors for real-time conversation practice, speech recognition software for pronunciation improvement, automated grammar and translation tools, adaptive learning platforms, gamified applications, and spaced repetition systems to support vocabulary retention. Automation helps streamline language acquisition, making the process more efficient, engaging, and accessible to learners at various proficiency levels (Smutny & Schreiberova, 2020, p. 4).

This study aims to explore the concept of language learning automation from the perspective of university EFL students. The research is limited to fourth-year students in the Department of English at the College of Education for Women, University of Baghdad, during the academic year 2023–2024.

2. LITERATURE REVIEW

2.1 Literature Review

2.1.1 Automation Theory and Scientific Foundations

Automation, a discipline rooted in control theory and intelligent systems, predates the formal development of control theory. It encompasses a range of theoretical foundations—from basic models to advanced techniques—and involves communication systems ranging from sensors to virtual environments. It also includes human roles in automation and the functions of intelligent controllers (Nof, 2009, p. 146).

Automation involves the use of programmed commands and automatic feedback to perform tasks with minimal human involvement. As computing technology has advanced, automated systems have grown more complex, even surpassing human capabilities in many respects (Filgueira, 2022, p. 248).

In the context of language learning, automation draws on linguistics, cognitive science, and educational technology to optimize second language acquisition. For example, Krashen's Input Hypothesis highlights the importance of comprehensible input (i+1) tailored to learners' levels (Krashen, 1985, p. 102), a process automated systems can replicate.

Similarly, Vygotsky's Zone of Proximal Development (ZPD) supports the use of intelligent tutoring systems (ITS), which simulate teacher guidance through adaptive feedback and scaffolded tasks (Vygotsky, 1978, p. 31).

Recent progress in Natural Language Processing (NLP) and Machine Learning (ML) has fueled the creation of AI-driven tools like Duolingo, Babbel, and chatbots, which adapt learning paths based on user performance (Godwin-Jones, 2018, p. 3). Gamification, inspired by Deci and Ryan's Self-Determination Theory (1985, p. 43), boosts learner motivation through challenges, rewards, and interactive features.

Additionally, CALL (Computer-Assisted Language Learning) has provided a research foundation for decades. Levy (1997, p. 12) defined CALL as the study of computer applications in language teaching and learning, a concept central to understanding language learning automation.

2.1.2 Artificial Intelligence in the Language Learning–Teaching Process

Natural Language Processing (NLP) allows machines to understand human language, facilitating features such as machine translation, automated feedback, and interactive learning activities. Modern AI systems support input analysis and can autonomously generate learning activities that improve learner outcomes (Chinkina et al., 2020, p. 146).

Pérez-Paredes et al. (2022, p. 21) found that while teachers show positive attitudes toward NLP tools, many lack awareness of their educational applications, highlighting the need for teacher training in AI.

Data-driven learning (DDL) through corpus analysis enables learners to explore language patterns in authentic contexts. Studies have explored DDL in essay writing, reading comprehension, scientific writing, and mobile-assisted language learning (Crosthwaite et al., 2023, p. 1395). However, Tono et al. (2014, p. 149) caution that not all error types (e.g., addition or omission) are easily corrected through corpus data alone.

Hadley and Charles (2017, p. 133) advocate a data-directed approach to improve reading speed and lexicogrammatical knowledge in lower-proficiency learners, while Wu (2021, p. 192) emphasized training learners to effectively use corpora for identifying collocations in academic writing.

Chukharev-Hudilainen and Saricaoglu (2016, p. 495) introduced the Automatic Writing Evaluation (AWE) tool to help learners revise writing through system-generated feedback. Although AWE improves surface-level issues, more research is needed to enhance contextual feedback and genre-based writing support.

Intelligent Tutoring Systems (ITS) simulate human instruction through personalized and interactive AI-powered interfaces. These systems, increasingly adopted in EFL education, offer autonomous learning support adaptable to various learning contexts (Jiang, 2022, p. 3).

Automatic Speech Recognition (ASR) converts spoken language to text and is used in personal assistants and language learning applications. ASR has improved L2 pronunciation by offering real-time, individualized feedback. Evers and Chen (2022, p. 1871) found that integrating ASR with peer feedback improves learners' pronunciation skills.

Chatbots, software designed to mimic human conversation, are widely used across industries—including education. They interpret user input, identify intent, and deliver responses based on pre-programmed scripts, supporting language learners through interactive and contextual dialogue (Smutny & Schreiberova, 2020, p. 2).

2.2 Previous Studies

2.2.1 Al-Mofti (2020)

The Effect of Using Online Automated Feedback on Iraqi EFL Learners' Writings at University Level

This study investigated the impact of online automated feedback on university-level Iraqi EFL learners' writing. Sixty students from the University of Anbar were randomly divided into two groups: experimental and control, each comprising 30 participants. A pre-test, post-test, and questionnaire were used to collect data. Statistical analysis revealed that students in the experimental group, who received automated feedback, significantly outperformed those in the control group, who received traditional feedback. Both qualitative and quantitative analyses of questionnaire responses confirmed the learners' positive attitudes and high satisfaction with automated feedback. Based on these findings, the study strongly recommends integrating online automated feedback into EFL writing instruction.

2.2.2 Huang & Renandyab (2020)

Exploring the Integration of Automated Feedback Among Lower-Proficiency EFL Learners

This study aimed to explore students' perceptions of the Automated Writing Evaluation (AWE) system and its effects on writing quality after revisions. Participants included 67 college students enrolled in two English classes at a Chinese university. One class (N=35) served as the experimental group, while the other (N=32) served as the control. Data were gathered from pre- and post-test writing assignments and questionnaire responses. Although lower-proficiency students generally responded

positively to the feedback provided by AWE, statistical analysis of their revised texts showed that automated feedback did not consistently result in significant improvements.

2.2.3 Aldosemani et al. (2023)

Automated Writing Evaluation in EFL Contexts: A Review of Effectiveness, Impact, and Pedagogical Implications

This review examined 16 studies on the effectiveness of AWE systems in EFL contexts, particularly how they support learner autonomy and reduce teacher workload. The review highlighted variability in the effectiveness of AWE depending on learners' proficiency levels. While AWE offers reliable and high-quality feedback, the review emphasized the need for complementary human interaction to address its limitations. The authors concluded that AWE can be a beneficial tool when implemented thoughtfully and in conjunction with teacher guidance.

2.2.4 Discussion of Previous Studies

While the three reviewed studies focus specifically on automated writing feedback, the present study adopts a broader perspective by examining automation in EFL learning as a whole—including the roles of the teacher, the textbook, and the assessment of all four language skills.

All three previous studies involved university students, with the exception of Aldosemani et al. (2023), which is a review of multiple studies with varied samples. In terms of methodology, Al-Mofti (2020) and Huang & Renandyab (2020) conducted experimental studies, while the current study employs a descriptive design. However, both the second study and the current one share the use of a questionnaire as a data collection tool.

3. METHODOLOGY

3.1 Study Design

This study adopts a descriptive, quantitative research design. Quantitative research focuses on measuring and analyzing variables using statistical methods to draw conclusions. It answers questions such as “who,” “what,” “where,” “when,” and “how many” through numerical data (Aliaga & Gunderson, 2003, p. 129).

Descriptive research aims to characterize phenomena as they exist. It prioritizes understanding “what” is happening rather than “how” or “why,” often using tools like surveys and observations for data collection (Gall et al., 2007, p. 287).

3.2 Population and Sample

The population of this study includes fourth-year students in the Department of English at the College of Education for Women, University of Baghdad. Out of a total population of 350 students, a randomly selected sample of 107 students responded to the questionnaire.

3.3 Instrument

The primary tool for data collection is a researcher-designed questionnaire on English language learning automation. The questionnaire consists of 15 items rated on a five-point Likert scale: Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree.

3.4 Scoring Scheme

Each questionnaire item is scored from 5 to 1, corresponding to the Likert scale options. The total possible score ranges from 15 to 75. Interpretation of scores follows the scale shown in Table 1.

Table (1)

Alternatives	Value	Range	
Strongly agree	5	4.21-5.00	
Agree	4	3.41- 4.20	
Neutral	3	2.61-3.40	
Disagree	2	1.81-2.60	
Strongly disagree	1	1.00-1.8	

Item Direction

3.5. Validity

3.5.1. Face Validity

The degree to which the findings can be appropriately interpreted and broadly generalized is known as validity (Brown & Rodgers, 2004:294). The questionnaire was given to the jury members listed in Table (2) to assure its face validity, and the jury members agreed that the questionnaire items were valid.

Table (2)

N	Academic Rank	Name	Field	College	
	Prof.Dr	Shatha Alsaadi	EFL	College of Education for Women, University of Baghdad	
	Prof. Dr.	Baan Jaafar	EFL	College of Education for Women, University of Baghdad	
	Asst. Prof. Dr.	Hanan Dhia Alsalihi	EFL	College of Education for Women, University of Baghdad	
	Asst. Prof	Maysaa Rashed	EFL	College of Education for Women, University of Baghdad	

The Academic Ranks, Names, Fields, and Locations of the Jury Members

Pilot Study

A pilot study is conducted to check the appropriateness of the instruments for the sample and if there is any ambiguity in the items or electronic problem in the Google form of the questionnaire. Accordingly, a sample of (20) students was chosen randomly from the population. The findings of the pilot study reveal that there is no ambiguity within items.

3.5.3. Construct Validity

It describes the degree to which a tool genuinely assesses the theoretical construct it is intended to measure. Empirical construct validity can be attained by examining the relationships between test items (Gall et al., 2007:460). Accordingly, item analysis will be processed to get the item-total correlation and item discrimination.

Item- Total Correlation

Pearson correlation coefficient is used to find out the item -total correlation. The statistical analysis of items reveals that all the correlation coefficient values are

significant compared to the R- critical value, which is (0.193) at a degree of freedom (105) and level of significance (0.05), see Table (3):

Table (3)

N	Items	R	
	Curriculum automation helps me to get the texts flexibly.	0.597	
	Audio text increases the opportunity to get the pronunciation accurately.	0.747**	
	Video text enables me to learn about culture and intercultural language.	0.686**	
	LLA makes the repetition of grammatical use and usage easy.	0.746**	
	LLA gives me the freedom to select the lecture time.	0.702**	
	It gives me a chance to select the teaching style that suits my learning style.	0.778**	
	I can make use of the recorded lectures and electronic teacher as I am doing my	0.870**	

	assignment.		
	I can get direct feedback from the electronic teacher and automatic programs as I am doing my assignments.	0.809**	
	The possibility of changing the electronic teacher if I can get direct feedback from the electronic teacher as I am doing my assignment.	0.827**	
	The possibility of changing the electronic teacher if I cannot understand its way of explaining.	0.783**	
	The highly professional questions.	0.712**	
	The ability to change the questions of the test with questions of the same difficulty power but in other items.	0.729**	
	The direct receiving of scores.	0.831**	
	After receiving the scores, I can decide to repeat the test after selecting another way of learning.	0.763**	

	I can check my level according to norm reference and criterion reference.	0.753**	

Item- Total Correlation

2. Item Discrimination

The extreme groups method is used to calculate the T- value between the higher and lower groups. The results reveal that all the items are significant with the critical T-value (2.02) at the degree of freedom (105) and level of significance 0.05. See Table (4)

Table (4)

Items	Higher and lower groups	Mean	Std. Deviation	T.	
	H	4.2222	1.01274	7.031	
	L	2.3333	.96077	7.031	
	H	4.6667	.62017	7.069	
	L	2.6296	1.36292	7.069	
	H	4.5926	.69389	8.268	
	L	2.2963	1.26536	8.268	
	H	4.4444	.57735	7.810	
	L	2.1852	1.38778	7.810	
	H	4.7407	.52569	10.770	
	L	2.1111	1.15470	10.770	

	H	4.7778	.42366	10.733	
	L	2.1111	1.21950	10.733	
	H	4.9630	.19245	19.267	
	L	1.5926	.88835	19.267	
	H	4.6667	.73380	9.100	
	L	2.2963	1.13730	9.100	
	H	4.8148	.39585	12.417	
	L	2.0000	1.10940	12.417	
	H	4.4815	.80242	8.594	
	L	2.1111	1.18754	8.594	
	H	4.4074	.74726	8.711	
	L	2.0741	1.17427	8.711	
	H	4.5556	.64051	9.469	
	L	2.3333	1.03775	9.469	
	H	4.8148	.39585	12.776	
	L	2.0000	1.07417	12.776	
	H	4.4444	.80064	7.724	

	L	2.2963	1.20304	7.724	
	H	4.5185	.75296	9.245	
	L	2.1481	1.09908	9.245	

Mean, Standard deviation, and T- values for item discrimination

3.6. Reliability

The degree of accuracy with which a test or set of scores measures the subject it is intended to measure is known as reliability. (Verma & Beard, 1981:87). The internal reliability is represented by the Alpha-Cronbach reliability coefficient (0.947), which is considered acceptable.

Test-retest reliability is another type of reliability used to show the consistency of results. The correlation coefficient is 0.94, which shows a high level of reliability.

3.7. Statistical tools

The SPSS program is used to find out the reliability factor and the weighting means and frequencies of the items.

4. DISCUSSION OF RESULTS

The results of the aim of the study are presented in one sample t-test. It shows that the student's perspective is with the automation of language learning since the arithmetic mean of 52.962 is higher than the theoretical mean of 45 at df 105 and a significance level of 0.05. See Table (5)

Table (5)

N	Theoretical Mean	Mean	Std. Deviation	df	T	Critical T.	Sig. 0.05	
107	45	52.96	14.825	105	5.556	1.986	Sign.	

Theoretical mean, mean, standard deviation, degree of freedom, t- t-values, and significance level for one sample t-test.

Table (6) detailed identification of the students' perspective concerning the automation of language learning.

Table (6)

N	Items	Alternatives	Alternatives	Alternatives	Alternatives	Alternatives	Percent.	Mean	St.	T.	Item direction	
N	Items	Strongly agree	Agree	Neutral	disagree	Strongly disagree	Percent.	Mean	St.	T.	Item direction	
	2	9	8	19	29	42	76.262	3.8131	1.26738	6.636	agree	
	13	14	12	13	27	41	72.898	3.6449	1.42254	4.689	agree	
	7	18	7	15	23	44	72.71	3.6355	1.48827	4.417	agree	
	3	12	8	26	26	35	71.962	3.5981	1.31651	4.7	agree	
	14	10	14	18	34	31	71.588	3.5794	1.28883	4.651	agree	
	6	11	15	16	32	33	71.402	3.5701	1.33255	4.425	agree	
	8	8	14	25	32	28	70.842	3.5421	1.22305	4.584	agree	
	9	13	9	24	29	32	70.842	3.5421	1.32665	4.226	agree	
	15	11	9	26	33	28	70.842	3.5421	1.25353	4.473	agree	
	10	10	16	21	30	30	70.094	3.5047	1.29858	4.02	agree	
	12	9	13	25	39	21	69.346	3.4673	1.18415	4.082	agree	
	11	13	11	24	37	22	68.2	3.4	1.26	3.3	neutr	

							24	112	605	6	al	
	4	15	8	26	35	23	68.038	3.4019	1.29484	3.21	neutral	
	5	15	13	26	21	32	67.85	3.3925	1.39241	2.916	neutral	
	1	10	15	34	27	21	66.356	3.3178	1.21001	2.716	neutral	

Alternatives, Percentage, Mean, Standard deviation, T. Value, and Item Directions.

The results show that the higher three items are 2, 13, and 7respectively, with means 3.8131, 3.6449, and 3.6355 that show agree direction, while the lowest three items are 4, 5, and 7 with means 3.4019, 3.3925, and 3.3178 that show neutral direction. I return to the statements of the higher items, (2) Audio text increases the opportunities of getting the pronunciation accurately, (13) The direct receiving of scores, and (7) I can make use of the recorded lectures and electronic teacher as I am doing my assignment, it is obvious that the students see that the automation of language learning is beneficial in the aspects that need the technology such as Audio and video text. Moreover, their emphasis on immediate feedback, which is the same results of all previous studies strongly encourages the integration and application of online automated feedback. The lowest items state that (4) LLA makes the repetition of grammatical use and usage easy, (5) LLA gives me freedom in selecting the lecture time, and (1) curriculum automation helps me to get the texts flexibly. These statements show that the repetition of grammar is not a big deal for students besides the area of democracy that they get from automation such as the selection of lecture time and curriculum.

5. CONCLUSION

Discussions surrounding the pedagogical responsibilities and technological requirements for integrating AI in language learning and teaching will continue. To effectively implement AI-supported language education, educators must have a comprehensive understanding of the key factors involved. They need to ensure that AI is utilized in ways that enhance language learning and teaching within the contexts it is designed to support. Educators must also be equipped to manage specific learning situations and to harness AI technologies and applications effectively. It is important for both educators and students to consider how to incorporate essential human skills, such as creativity, collaboration, and critical thinking, in AI-driven environments. Future research should focus on a more in-depth exploration of AI applications and technologies in second language (L2) and foreign language (FL) instruction.

References

Aldosemani, T. I., Assalahi, H., Lhothali, A., & Albsisi, M. (2023). Automated Writing Evaluation in EFL Contexts: A Review of Effectiveness, Impact, and Pedagogical Implications. *International Journal of Computer-Assisted Language Learning and Teaching* (IJCALLT), 13(1), 1-19.

Agley , C. (2022). *The power of automation and its central role in learning and development: How will integrating automation in learning help ensure the L&D function has an impact on future business*?

Aliaga, M. & Gunderson, B. (2003*). Interactive Statistics (Second Edition).* Upper Saddle River, NJ: Prentice Hall.

Al-Mofti, K. W. H. (2020). The effect of using online automated feedback on Iraqi EFL learners' writings at university level. *Journal of the College of Education for Women*, 31(3), 1-14.

Brown, J. D., & T. S. Rodgers (2004). *Doing Second Language Researc*h. Oxford: Oxford University Press.

Chinkina, M., Ruiz, S., & Meurers, D. (2020). *Crowdsourcing evaluation of the quality of automatically generated questions for supporting computer-assisted language teaching.* ReCALL, 32(2), 145–161.

Chukharev-Hudilainen, E., & Saricaoglu, A. (2016). Causal discourse analyzer: Improving automated feedback on academic ESL writing. *Computer Assisted Language Learning,* 29(3), 494–516.

Crosthwaite, P., Luciana, & Wijaya, D. (2023). Exploring language teachers' lesson planning for corpus-based language teaching: A focus on developing TPACK for corpora and DDL. *Computer Assisted Language Learning*, 36(7), 1392–1420.

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic Motivation and Self-Determination in Human Behavior.* Springer.

Evers, K., & Chen, S. (2022). Effects of an automatic speech recognition system with peer feedback on pronunciation instruction for adults. *Computer Assisted Language Learning,* 35(8), 1869–1889

Filgueira, R. (2022, October). frances: A Deep Learning NLP and Text Mining Web Tool to Unlock Historical Digital Collections: A Case Study on the Encyclopaedia Britannica. *In 2022 IEEE 18th International Conference on e-Science* (e-Science) (pp. 246-255). IEEE.

Gall, M.D., Gall, J.P., & Borg, W.R. (2007). *Educational research: An introduction* (8th ed.). Boston: Pearson.

Godwin-Jones, R. (2018). "Using Mobile Technology to Develop Language Skills and Cultural Understanding." *Language Learning & Technology*, 22(3), 1–17.

Hadley, G., & Charles, M. (2017). Enhancing extensive reading with data-driven learning. *Language, Learning and Technology*, 21(3), 131–152

Huang, S., & Renandya, W. A. (2020). Exploring the integration of automated feedback among lower-proficiency EFL learners. *Innovation in language learning and teachin*g, 14(1), 15-26. DOI: 10.1080/17501229.2018.1471083

Jiang, R. (2022). How does artificial intelligence empower EFL teaching and learning nowadays? A review on artificial intelligence in the EFL context. *Frontiers in Psychology*, 13, 1049401.

Krashen, S. D. (1985). *The Input Hypothesis: Issues and Implications*. Longman.

Levy, M. (1997). *Computer-Assisted Language Learning: Context and Conceptualization.* Oxford University Press.

Nof, S. Y. (2009). *Springer Handbook of Automation* (pp. 1379–1396). S. Y. Nof (Ed.). Berlin, Heidelberg: Springer Berlin Heidelberg.

Pérez-Paredes, P. (2022). A systematic review of the uses and spread of corpora and data-driven learning in CALL research during 2011–2015. *Computer Assisted Language Learning*, 35(1–2), 36–61.

Selwyn, N., Hillman, T., Bergviken Rensfeldt, A. et al. *Digital Technologies and the Automation of Education — Key Questions and Concerns*. Postdigit Sci Educ 5, 15–24 (2023).

Smutny, P., & Schreiberova, P. (2020). Chatbots for learning: A review of educational chatbots for the Facebook Messenger. *Computers & Education*, 151, 103862.

Tono, Y., Satake, Y., & Miura, A. (2014). *The effects of using corpora on revision tasks in L2 writing with coded error feedback*. ReCALL, 26(2), 147-162.

Verma, G. K. & Beard, R. N. (1981) *What is Educational Research: Perspectives and Techniques of research* (Aldershot: Gower).

Vygotsky, L. S. (1978). *Mind in Society: The Development of Higher Psychological Processes.* Harvard University Press.

Wu, Y.-j. (2021). *Discovering collocations via data-driven learning in L2 writing. Language, Learning and Technology*, 25(2), 192–214.