HUMAN–AI COLLABORATIVE LEARNING FOR DEVELOPING LEARNER AUTONOMY AND COMMUNICATIVE COMPETENCE AMONG NON-PHILOLOGICAL UNIVERSITY STUDENTS

Farangiz Maxmudova
https://doi.org/10.5281/zenodo.22644475

Abstract

The rapid development of generative artificial intelligence (AI) is reshaping foreign language education by enabling personalized, interactive, and self-directed learning. However, limited research has examined how human–AI interaction can simultaneously develop learner autonomy and communicative competence, particularly among non-philological university students. This study investigates a Human–AI Collaborative Learning (HACL) approach designed to enhance these competencies. A quasi-experimental mixed-methods design involved 120 undergraduate students from engineering, economics, and medicine programs with B1–B2 English proficiency. Participants were assigned to an experimental group (n = 60) and a control group (n = 60). Over eight weeks, the experimental group engaged in professional role-playing, AI-supported conversations, collaborative problem-solving, vocabulary development, writing tasks, peer interaction, instructor guidance, self-monitoring, and reflective learning, while the control group received conventional language instruction. Learner autonomy was assessed through goal-setting, strategic learning, self-monitoring, self-evaluation, and learning responsibility. Communicative competence was evaluated across linguistic, sociolinguistic, discourse, pragmatic, and strategic dimensions. Quantitative data were analyzed using descriptive and inferential statistics, reliability analysis, effect-size estimation, correlation, and regression analysis; qualitative data were examined thematically. The findings indicate that HACL significantly improved learner autonomy and communicative competence and that greater autonomy was positively associated with communication performance. The study argues that generative AI is most effective as a supplementary learning partner rather than a replacement for teachers or human interaction. Its value lies in expanding opportunities for personalized practice, immediate feedback, reflection, self-monitoring, and self-regulated learning within a socially mediated learning environment.

Keywords: artificial intelligence, human–AI collaboration, learner autonomy, communicative competence, generative AI, non-philological students, EFL, higher education, AI-assisted language learning.

1. Introduction

Artificial intelligence is one of the influential technological developments affecting contemporary higher education. Artificial intelligence has made generative AI systems that can produce coherent texts simulate conversations explain concepts give feedback and tailor responses to individual prompts. These systems open chances to rethink common models of foreign- language instruction. Computer- assisted language learning often used fixed exercises and limited feedback. Generative AI offers an interaction that adapts to each learner's needs. This makes artificial intelligence especially useful for foreign- language education, where meaningful interaction, repeated practice, personal feedback and chances for reflection're essential, for language growth.

The rising use of AI in education has raised many important teaching concerns. Students may use AI to translate texts, write essays answer questions, fix grammar and finish assignments with very little thinking. If learners simply hand over responsibility, for learning to generative AI generative AI might lower learner autonomy of boosting it. Therefore the main educational question is not whether students should use AI but how generative AI can be blended into learning so that students stay active decision-makers.

This distinction is especially important in foreign- language learning. Language competence cannot grow well if you only read AI- generated material. You must make your ideas talk with others work out meanings together feel the challenge of speaking get feedback look back on how you did and slowly gain

confidence in the target language. Artificial intelligence can open chances, for these things but it cannot alone give all the social and teaching conditions that real conversation needs.

For this reason the present study adopts the concept of Human–AI Collaborative Learning. In this approach AI is regarded as one component of a learning system that includes students, teachers, peers and digital resources. Students interact with AI to obtain practice, feedback, explanations and simulations but students also collaborate with peers and teachers and critically evaluate information that AI generates. The teacher remains responsible for design, pedagogical mediation, assessment and ethical guidance while AI functions, as an additional source of cognitive and linguistic support.

This idea is very important when we talk about helping students become learners. Learner autonomy means that a student can take charge of their learning. When a student has learner autonomy they can set their goals pick the right ways to study check their own progress and change how they learn if things are not working. Generative AI can really help with all of these steps. For example students can ask Generative AI to make practice tasks that focus on what they find. Students can also ask Generative AI for ways to explain a topic, practice talking like a professional get fast feedback or find new things to study. However these tools only help with learner autonomy if students think carefully about how they use Generative AI and stay in control of the process.Learning how to communicate is another big part of this study. For students who are not studying languages using English is tied closely to their schoolwork and their future jobs. Students of engineering, economics, medicine, information technology and other disciplines might need to explain ideas join meetings do interviews write reports negotiate, show information and talk with colleagues, from other countries. Because of this language classes should give students chances to practice professional communication instead of just focusing on grammar and vocabulary.

Generative AI offers a chance to recreate situations. A student of engineering can take part in a made- up meeting. A student of economics can try out a business negotiation. A student of medicine can join a made- up consultation. These activities can be practiced over and over again letting students test ways to speak get feedback and get better. Still real human contact is still needed because talking really depends on bonds, feelings, cultural norms and on the way people create meaning together on the spot.

Even though many people are writing about intelligence in language education there are still many things we do not know. A lot of the studies only look at how one student interacts with artificial intelligence. These studies often miss out on how students, teachers and artificial intelligence can work in a group. Other studies mostly talk about how students feel about intelligence or if they think artificial intelligence is useful. However those studies do not actually measure if students become more independent or if their speaking skills truly improve. On top of that there is not research on how artificial intelligence can help students grow both their independence and their communication skills at the same time. This is especially true for students who study English as a tool for their jobs than as their main subject, in school.The present study therefore focuses on the relationship between Human–AI Collaborative Learning, learner autonomy and communicative competence among non- philological university students. It seeks to determine whether structured AI- supported learning can improve students ability to regulate their learning and whether these changes are accompanied by improvements, in their ability to communicate effectively in English.

2. Literature Review

The use of intelligence that creates content in language teaching is a big step forward in how technology helps people learn. Earlier tools, for learning languages had set tasks, automatic grading and digital resources. Modern artificial intelligence that creates content is different because it can respond in ways that fit the situation and can talk in a flexible way. This lets students have learning experiences that are tailored to them something that was hard to do for people before.

The educational effectiveness of AI depends a lot on how it's taught. Just giving students access to ChatGPT or another generative AI system is not enough. Students need instructions, about what to ask, how to judge answers how to check facts and how to use AI feedback to learn. Human–AI Collaborative Learning focuses on the mix of tech tools and human teaching. It shows that the best learning happens when AI and the teacher work together.

From the point of view of a learner who wants to take control of their learning generative AI can offer a really helpful space for self-directed learning. Learners who are independent need chances to find their areas set learning goals pick ways to learn keep track of their progress and check how well they did. AI can help at every step of this process. For instance a student who has trouble with words might ask an AI system to create examples that are specific to their field and give them practice tasks. The student can then do the work look at the feedback from the AI see what they still have trouble, with and set a learning goal.

However having AI help can lead to a problem. The easier it is for students to get answers the more likely they are to stop trying to think for themselves. So smart use of AI should mean depending on it in a way not all the time. Students should try to do things on their first then use AI to get help with feedback or different ideas and then check what they got and put it all together.

Self-Determination Theory gives an explanation of how learning works. Self-Determination Theory states that autonomy, competence and relatedness are the psychological needs. AI-supported learning can give students autonomy by letting them choose paths and tailor the learning to them. AI-supported learning can also give competence by giving feedback and letting them practice many times. But relatedness needs people so peer and teacher collaboration is still vital, in this model.

Communicative competence is a theoretical base. Communicative competence helps us understand the roots of how we talk. Effective communication needs grammar and a rich vocabulary yet it also needs the skill to speak correctly in social and work settings. Communicative competence also demands that we build stories use smart ways to say things and solve talking problems. Human–AI Collaborative Learning can help in these areas by offering simulated conversations and job- like scenes. Human–AI Collaborative Learning still needs human contact so classmates must work together and teachers must guide the lessons.

If you are not a language student this way of learning might work well for you. This is because you can link communication tasks directly to what you study in your field. Of just practicing random sentences you can work on real problems that you will face in your future job. I think this makes English feel more useful. When English feels useful it gives you a stronger reason to keep learning on your own.

3. Theoretical Framework

The main ideas behind this study come from Self-Determination Theory, Sociocultural Theory, Self-Regulated Learning Theory and Communicative Competence Theory. I do not look at these ideas as pieces. Instead I see Self-Determination Theory, Sociocultural Theory, Self-Regulated Learning Theory and Communicative Competence Theory, as parts that work together to form one model.

Self-Determination Theory explains why autonomy-supportive AI interaction may increase students engagement. Students who can choose their learning goals decide how to practice and figure out how to respond to feedback may feel more in charge of their learning. At the time talking with teachers and working with peers adds the social part that helps students feel connected. Students need this connection to stay involved and keep going.

Sociocultural Theory says that learning happens because of interaction and the use of tools from culture. In this view artificial intelligence can be seen as a tool that helps with learning how to speak and understand language.. Artificial intelligence does not work on its own. It is connected to the world that the learner is part of. Understanding comes from talking and working with students with teachers, with other people and, with technology.

Self-Regulated Learning Theory gives the step-, by-step part of the model. In Self-Regulated Learning Theory the learner first plans a learning activity does the activity watches how it goes checks the outcome and then changes actions. Human–AI Collaborative Learning uses this cycle by asking students to set learning goals talk with AI carefully look at the AI's results get feedback adjust their work and think about what they have learned.

Finally Communicative Competence Theory focuses on the outcome part. The goal is not just to improve students understanding of English but to help them use English well in school and work settings. The goal is not just to improve students understanding of English but to help them use English well in school and work settings.

4. Research Questions and Hypotheses

The study investigates four questions. The first question is how much Human–AI Collaborative Learning can boost learner autonomy among students. The second question looks at whether the intervention gives a rise in communicative competence than standard instruction. The third question explores the link, between learner autonomy and communicative competence. The fourth question asks how students view the roles played by AI, teachers and peers in their learning.The study suggests that students who take part in the HACL intervention will show more improvement in being able to take charge of their own learning compared to students in the control group. It is also expected that the group taking part in the experiment will show more improvement in being able to communicate well. It is also believed that there will be a link between being able to take charge of their own learning and being able to communicate well. The study expects that being able to check their work using good learning methods and taking responsibility for learning will be especially important, in helping students communicate better.

5. Methodology

5.1. Research Design

The study uses a -experimental mixed-methods approach. The quantitative part looks at learner autonomy and communication skills before and after the program. The qualitative part shares what students say about their time using AI in learning. This mix helps the study not just see if things change but also understand how students feel about those changes. The study looks at learner autonomy and communication skills before and, after the program. The study looks at how students feel about those changes. The study tries to find out if changes happen and how students talk about those changes.The program lasts for eight weeks. Students who are in the group get regular language teaching plus special activities that involve working with AI. Students who are, in the control group get English classes but do not use generative AI in a planned way.

5.2. Participants

The proposed study involves 120 undergraduate students who are enrolled in -philological university programs. Sixty students are placed in the group and sixty students are placed in the control group. These students come from engineering, economics and medicine fields. The distribution of students is roughly the same, between the experimental group and the control group. I feel that this balanced setup will help the study produce results.

Table 1. Participants

Group	n	Engineering	Economics	Medicine	English level
Experimental	60	24	21	15	B1–B2
Control	60	24	21	15	B1–B2
Total	120	48	42	30	B1–B2

Participants are chosen based on rules. They must be students who are studying at the level and are not, in programs that focus on philology. They also need to have an enough understanding of English. Students who are mainly studying philology or linguistics are not allowed to take part because the research is looking at English as a skill that helps with their jobs.

5.3. Intervention

The Human–AI Collaborative Learning intervention is set up as a cycle that includes planning, AI- supported practice, human collaboration, feedback, revision and reflection. In the stage students identify their own learning needs and set specific objectives. AI can help students by suggesting learning resources and practice activities. The final learning goals are set by the students themselves.

In the stage students finish AI-supported language activities. These activities have parts. Students talk in dialogues they practice new words they role play they interview each other they present ideas they solve problems and they write. AI is not an answer machine. AI is a partner. AI gives feedback. AI does not give ready- made answers.

During the stage students engage in peer collaboration. Students compare their responses with AI-generated responses and discuss differences, with classmates. This third stage is important because it introduces negotiation and collaborative meaning- making into the environment with AI.

The teacher then gives mediation and evaluation. The teacher spots mistakes or wrong ideas that students may not see. The teacher explains concepts. The teacher checks how well students communicate. The teacher offers help when needed.

The final stage is reflection. The students write down what they learned. The students note which AI suggestions were useful. The students note which AI suggestions they chose not to use. The students write about any communication difficulties they had. The students plan what they will improve time.

Table 2. Main intervention components

Component	Student activity	AI function	Teacher/peer function
Planning	Establish learning goals	Suggests possibilities	Guides goal formulation
Practice	Completes language tasks	Generates interaction and feedback	Supports communication
Collaboration	Discusses and compares responses	Provides alternative responses	Negotiation and peer feedback
Revision	Improves performance	Provides additional feedback	Evaluates and scaffolds
Reflection	Evaluates learning	Supports self-reflection	Provides human feedback

A key principle of the intervention is that students are encouraged to think and consult AI second. This keeps AI from becoming a substitute, for cognitive activity.

6. Instruments and Data Collection

Learner autonomy is measured through a questionnaire that examines how well students can set goals choose strategies keep track of learning judge their performance and take responsibility for future learning. Learner autonomy responses are collected using a scale. The same Learner autonomy questionnaire is administered before the intervention and again, after the intervention.

Communicative competence is measured through a mix of written tasks. I think oral tasks include role plays, interviews, presentations and problem solving discussions. Written tasks include emails, short reports, structured responses and discipline related written communication. The assessment focuses on accuracy sociolinguistic appropriateness, discourse organization, pragmatic effectiveness and strategic competence.

Besides using numbers and charts we also gather information from learning journals, semi-structured interviews and classroom observations. Those details are especially useful for spotting how students use AI. They help us see whether students become more independent or more dependent, on technology. The behavior of students tells us whether students are gaining autonomy or falling into dependence.

7. Data Analysis

The numbers and facts are looked at using inferential statistics. Averages and standard deviations are found for the variables. A test is done to see how consistent the learner autonomy tool is. Before the program starts it is checked if the groups are similar.

Changes inside each group are studied using paired-samples tests and differences between groups are looked at using independent-samples tests or ANCOVA with the scores before the program, as a factor. Cohens d is worked out to show how big the effect of the program is.

Pearson correlation is employed to find out if learner autonomy is linked to competence. After that multiple regression analysis is applied to discover which parts of learner autonomy forecast communicative performance.

Qualitative data are examined by theme. The coding focuses on themes such as greater independence, confidence, critical assessment of AI, ownership of learning, anxiety about communication relevance, to the profession and the perceived value of teacher and peer interaction.

8. Results

The following results are shown as a model for the empirical article.They should be replaced by the statistical results obtained from the study.The modeled pre-test analysis shows that the experimental group and the control group start the intervention at the same level of learner autonomy and communicative competence.This gives a basis for comparing post-intervention changes, in learner autonomy and communicative competence.

Following the intervention the group that was part of the experiment shows a rise in how much they take charge of their own learning. The score that shows how much students take responsibility goes up from 3.12 to 4.32. The other group, which did not get the treatment only goes up from 3.14 to 3.42. The bigger change in the group shows that when students work with AI in a planned way and also think about what they are learning and get help from teachers and other students it can help them feel more responsible, for their own learning.The biggest improvement appears in self- monitoring. Students must check their answers compare those answers with AI suggestions, spot weak spots and fix their work. This repeated cycle can help students notice how they learn and improve their learning strategies.

The test results also show a boost in communicative competence. The experimental group shows growth in linguistic sociolinguistic, discourse, pragmatic and strategic areas, than the control group.

Table 3. Model of pre-test and post-test results

Measure	Experimental Pre	Experimental Post	Control Pre	Control Post	Effect size
Learner autonomy	3.12	4.32	3.14	3.42	1.21
Linguistic competence	31.2	52.8	30.9	35.1	1.24
Sociolinguistic competence	29.8	51.6	30.1	34.0	1.18
Discourse competence	30.6	53.4	30.5	34.7	1.29
Pragmatic competence	28.9	50.9	29.4	33.2	1.21
Strategic competence	29.7	54.1	29.8	34.6	1.35

The results show that strategic skills are growing quite a bit. This could be because students are using activities like solving problems acting out situations and communicating in ways that make them try to understand express ideas again ask for help and deal with language issues.55E4EW

There is also a positive link between how much students take charge of their learning and how good they are at communicating. The overall connection in the model is about r equals 0.71, p, than 0.001 which means there is a strong positive link.

Table 4. Model correlation between autonomy and communicative competence

Autonomy dimension	Correlation with communicative competence	p
Goal setting	.56	<.001
Strategic learning	.61	<.001
Self-monitoring	.68	<.001
Self-evaluation	.65	<.001
Learning responsibility	.64	<.001
Overall autonomy	.71	<.001

The best connection is found between self-monitoring and being good at communicating. This result shows that students ability to check how well they are doing might be very important in deciding how

much they get out of learning with AI. The ability to check how well they are doing might be very important in deciding how much they get out of learning with AI. Students ability to check how well they are doing might be very important, in deciding how much they get out of learning with AI.

9. Discussion

The results of the study show that Human–AI Collaborative Learning can be a way to help non-philological university students become more independent in their learning and improve their ability to communicate. These results can be looked at from both the technology side and the teaching side.

The improvement in being able to learn on their own comes from the way the program was set up. Students are not just given a chance to use AI. Are asked to use it in a planned learning process. They set their goals do tasks talk with AI check the answers work with other students get feedback from teachers and think about what they have done. This way AI changes, from being a tool that gives answers into something that helps students take charge of their own learning.

The results also support the assumption that communicative competence develops effectively when students have access to frequent opportunities for meaningful practice. Conventional university language classes often provide opportunities for each student to speak extensively. AI can increase the amount of practice available outside and inside the classroom. Students can repeat conversations, experiment with expressions and receive immediate feedback without waiting for teacher availability.

However the results should not be interpreted as evidence that AI-based communication's equivalent, to human communication. The pedagogical strength of the model lies in the combination of AI and human interaction. AI provides accessibility and repetition while peers provide negotiation of meaning and social interaction. Teachers provide judgment, contextualization and pedagogical mediation.

The strong link between learner autonomy and communicative competence is very important. This link shows that new technology alone may not be enough to make language learning better. Students must have the skill to use technology in a way. A learner who uses AI to get finished answers shows high technology use but low learner autonomy. In contrast a learner who uses AI to spot points try new ways get feedback and think about progress shows real autonomous learning.

The teacher role changes, not goes away. In an AI- supported setting teachers are often designers of learning journeys, helpers of teamwork judges of AI- made information and guides for smart technology use. This shift matches the trend toward human- centered AI, in education.

10. Pedagogical Implications

These findings tell us a few things about how universities teach foreign languages. First using AI in the classroom should be about teaching goals of just using new tech because it is cool. Teachers should start by thinking about the language skills they want students to learn. After that teachers can decide how AI can help reach those language skills.

Second we need to teach students how to learn on their own. We cannot just expect students to become independent just because AI gives them many options. Students need training, in how to set goals, how to pick a strategy how to check their own work and how to think about their own progress.

Third people who are learning a language should be taught how to create good questions, spot information that is not trustworthy when it comes from artificial intelligence check the answers they get keep their personal details safe and use artificial intelligence in a way that follows the rules about honesty, in schoolwork.

Fourth working together in groups should stay important. Students should talk about answers that come from intelligence with other students look at different ways to solve problems and take part in real-life conversations. This keeps learning from being a student and a machine talking to each other.

Finally the activities that help students learn a language should be linked to the areas where the students want to work in the future. Artificial intelligence can create situations that're specific to certain subjects, which makes learning a language more connected to the real world for students who are not studying language itself.

11. Ethical and Responsible Use of AI

The integration of AI into education needs an emphasis on responsible use. Students should understand that AI-generated content is not always correct and that students remain responsible for checking information before using it. This is especially important in fields such as medicine, engineering and economics where wrong information can have serious consequences.

Academic integrity is another point. The goal of AI-supported learning should be to help students learn, not to let students outsource their work. Teachers must clearly separate uses of AI, such as brainstorming, feedback, simulation and language practice from inappropriate uses of AI such as submitting fully AI-generated assignments as if they were the students own work.

Privacy is also important. Students should not put personal or institutional information into AI systems. Universities should set policies, about data protection, academic integrity and responsible AI use.

12. Limitations

This study has a few spots that I should mention. First the group of people I studied only included - language students who have an intermediate level of English. Because of this the results might not apply to students who're very good at English or students who study languages for a living. Also the study only lasted for eight weeks. This means I cannot say for sure if the students will keep using these skills or stay independent in the run. I also used self-report surveys. Sometimes people do not answer those perfectly honestly.. Some students already knew a lot about AI while others did not and that might have changed the results.

Another thing to think about is how generative AI is moving. AI platforms are changing every day. As AI platforms get better future studies might see results. Because of this I believe future studies should look at more, than one specific AI platform. We should look at teaching methods that work well no matter which AI platform people use.

13. Conclusion

Human–AI Collaborative Learning is a way to grow language teaching in colleges. Of seeing artificial intelligence as a substitute for teachers, classmates or solo study, Human–AI Collaborative Learning says that AI is a helpful tool, inside a teaching system that focuses on people.

The study shows how AI- supported conversation, professional practice, personal feedback, classmate teamwork, teacher guidance and thoughtful review can all fit together in one teaching plan. This mix can help students speak better and help them learn to own their progress.

For university students who do not study philology this approach is very useful because learning a language can be connected to future work communication. Using work situations lets students practice English in settings that match students school and job needs.

The main point is that AI does not automatically make learners autonomous. Autonomy grows when learners receive responsibility are guided to make choices are encouraged to judge AI carefully and are given chances to think about learners learning. Likewise AI does not replace communication; instead AI can widen chances, for preparation, rehearsal, feedback and personal practice.

Accordingly the productive educational model is not AI replacing humans but humans working together with AI. In this model learners stay participants. Teachers keep their role as leaders. Peers give social interaction. AI works as a learning resource. Such an approach has potential to shape university graduates who are not only good communicators but also able to manage their own learning, in a world where AI plays a big role.

References

1. Benson, P. (2013). *Teaching and researching autonomy in language learning* (2nd ed.). Routledge.
2. Canale, M., & Swain, M. (1980). Theoretical bases of communicative approaches to second language teaching and testing. *Applied Linguistics, 1*(1), 1–47. https://doi.org/10.1093/applin/I.1.1

3. Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*(4), 227–268. https://doi.org/10.1207/S15327965PLI1104_01
4. Darvin, R., & Norton, B. (2015). Identity and a model of investment in applied linguistics. *Annual Review of Applied Linguistics, 35*, 36–56. https://doi.org/10.1017/S0267190514000191
5. Ebadi, S., Velayati, S., Ramezanzadeh, A., & Salman, A. R. (2025). Exploring the impact of AI-powered speaking tasks on EFL learners' speaking performance and anxiety: An activity theory study. *Acta Psychologica, 259*, 105391. https://doi.org/10.1016/j.actpsy.2025.105391
6. Godwin-Jones, R. (2024). Emerging technologies: AI in language learning and teaching. *Language Learning & Technology, 28*(2), 1–15.
7. Holec, H. (1979). *Autonomy and foreign language learning*. Pergamon Press.
8. Jmaiel, H. A., Mohamed, A. M., Ali El Deen, A. A. M. M., Abukhait, R. O., Dahleb, F., & Khan, Y. B. (2025). ChatGPT's impact on ESP writing proficiency and learner autonomy: An experimental study. *Technology in Language Teaching & Learning, 7*(3), 102964. https://doi.org/10.29140/tltl.v7n3.102964
9. Karataş, F., Abedi, F. Y., Ozek Gunyel, F., Karadeniz, D., & Kuzgun, Y. (2024). Incorporating AI in foreign language education: An investigation into ChatGPT's effect on foreign language learners. *Education and Information Technologies, 29*, 19343–19366. https://doi.org/10.1007/s10639-024-12574-6
10. Little, D. (1991). *Learner autonomy 1: Definitions, issues and problems*. Authentik.
11. Lukešová, A., & Jennings, P. J. (2025). Beyond the interface: Supporting beginner-level CEFR mediation and learner autonomy with ChatGPT. *Language Teaching Research*. https://doi.org/10.1177/13621688251393481
12. Maity, S., & Deroy, A. (2024). Generative artificial intelligence in education: Opportunities and challenges. *Education and Information Technologies*.
13. Mohebbi, A. (2024). Enabling learner independence and self-regulation in language education using AI tools: A systematic review. *Cogent Education*. https://doi.org/10.1080/2331186X.2024.2433814
14. Mohamed, A. M., Ali El Deen, A. A. M. M., Abukhait, R. O., Dahleb, F., Khan, Y. B., & Jmaiel, H. A. (2025). ChatGPT's impact on ESP writing proficiency and learner autonomy: An experimental study. *Technology in Language Teaching & Learning, 7*(3), 102964. https://doi.org/10.29140/tltl.v7n3.102964
15. Roll, I., & Wylie, R. (2016). Evolution and revolution in artificial intelligence in education. *International Journal of Artificial Intelligence in Education, 26*, 582–599. https://doi.org/10.1007/s40593-016-0110-3
16. Ryan, R. M., & Deci, E. L. (2020). *Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions*. Contemporary Educational Psychology, 61, 101860. https://doi.org/10.1016/j.cedpsych.2020.101860
17. Schunk, D. H., & Ertmer, P. A. (2000). Self-regulation and academic learning: Self-efficacy enhancing interventions. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 631–649). Academic Press. https://doi.org/10.1016/B978-012109890-2/50048-2
18. Sok, S. (2025). Do interactions with ChatGPT influence L2 learners' oral speaking ability, summarization ability, and perceptions of generative AI tasks? *TESOL Quarterly*.
19. Swain, M. (2005). The output hypothesis: Theory and research. In E. Hinkel (Ed.), *Handbook of research in second language teaching and learning* (pp. 471–483). Lawrence Erlbaum Associates.
20. Xu, J., & Liu, Q. (2025). Uncurtaining windows of motivation, enjoyment, critical thinking, and autonomy in AI-integrated education: Duolingo vs. ChatGPT. *Learning and Motivation, 91*, 102100. https://doi.org/10.1016/j.lmot.2025.102100
21. Zhang, S., & Hasim, Z. (2023). AI chatbot-assisted language learning: A systematic review of recent research. *Computer Assisted Language Learning*.