Integrating **Technology** in English Classes

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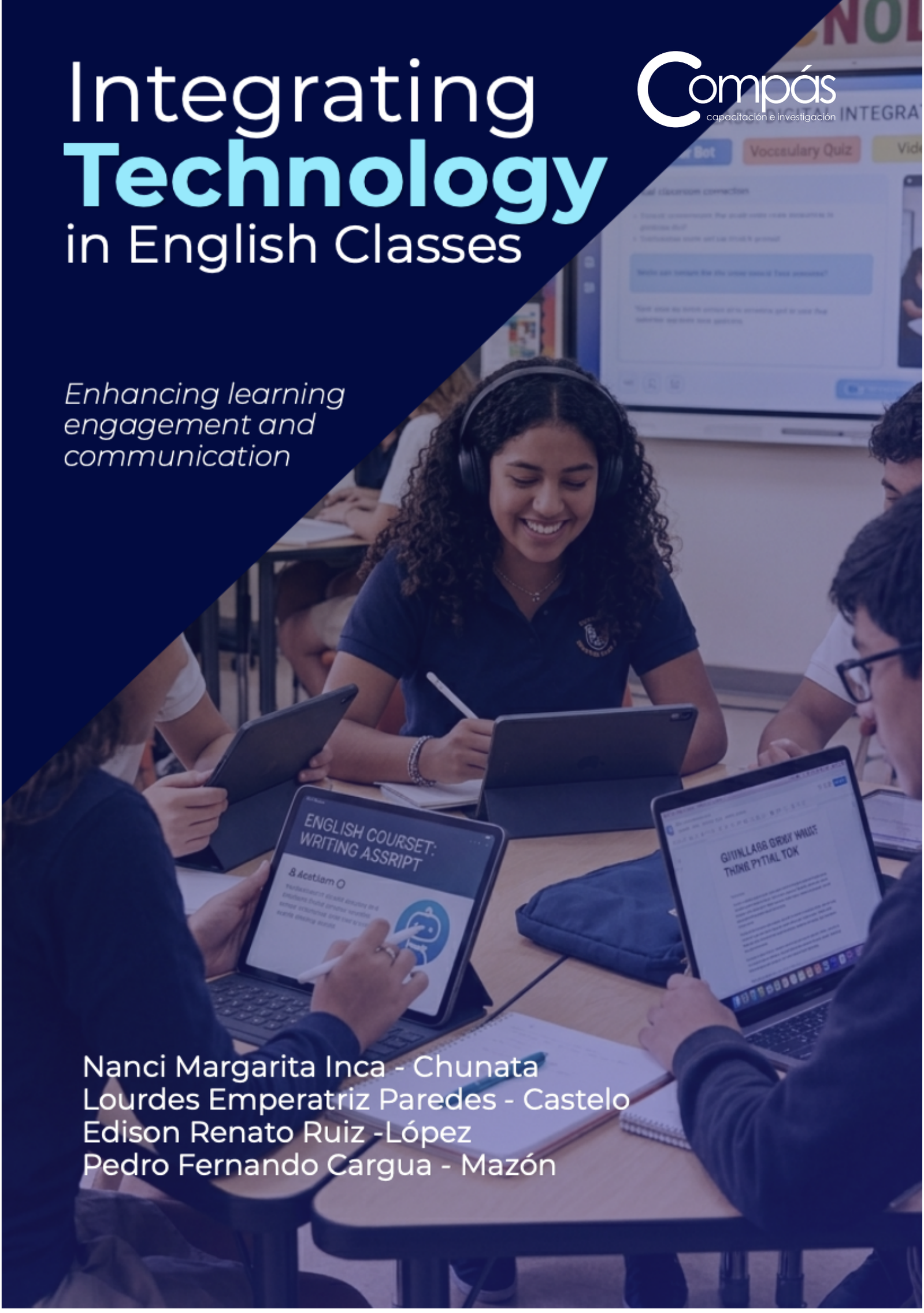
Enhancing learning engagement and communication



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ISBN: 978-9942-53-163-6
Primera edición, 2026

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ISBN: 978-9942-53-163-6
Distribución online
Acceso abierto

Cita
Inca-Chunata, N., Paredes-Castelo, L., Ruiz-López, E., Cargua-Mazón, P. (2026) Integrating Technology in English Classes. Editorial Grupo Compás

Guayaquil, Ecuador
www.grupocompas.com
http://repositorio.grupocompas.com

Primera edición, 2026

Esta obra ha sido sometida a un proceso de evaluación bajo el sistema de arbitraje doble ciego (double-blind peer review), garantizando el anonimato tanto de los autores como de los evaluadores externos. El dictamen favorable certifica que el contenido cumple con los más altos estándares de rigor científico, calidad editorial y originalidad exigidos por la comunidad académica internacional para su indexación y reconocimiento científico.

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Introduction

The rapid advancement of digital technologies has significantly transformed English language education. Today, integrating technology into English as a Second Language (ESL) and English as a Foreign Language (EFL) classrooms is not merely an innovation but a pedagogical necessity. Digital tools, immersive environments, and artificial intelligence are reshaping how teachers design instruction and how students interact with language. This book provides a comprehensive and practical guide to integrating technology in English classes while maintaining strong theoretical and ethical foundations.

Chapter 1, *Technology and Ethics in Language Learning*, examines the responsible use of digital tools in education. As technology becomes increasingly present in classrooms, issues such as data privacy, academic integrity, digital citizenship, and equitable access must be carefully addressed. This chapter emphasizes the importance of fostering safe, inclusive, and ethically sound learning environments while encouraging critical thinking about technology use.

Chapter 2, *Theoretical Foundations of Language Learning with Virtual Reality (VR)*, explores how immersive technologies can support language acquisition. Drawing on constructivist, communicative, and experiential learning theories, the chapter explains how Virtual Reality enhances contextualized practice, authentic communication, and learner engagement. It provides a research-based framework for understanding how immersive environments promote meaningful and interactive language development.

Chapter 3, *Integrating Technology in ESL Classes*, focuses on practical classroom applications. It presents strategies for lesson planning, digital assessment, collaborative learning, and differentiated instruction. Teachers will find adaptable models that align technological tools with communicative objectives and task-based methodologies across different proficiency levels.

Chapter 4, *AI Tools, Apps, and Digital Platforms for English Teachers*, introduces emerging artificial intelligence resources that are transforming language instruction. It offers guidance on selecting and implementing AI-

driven tools for feedback, content creation, and personalized learning, always emphasizing that technology must support pedagogy rather than replace it. Overall, this book bridges theory and practice, empowering educators to integrate technology effectively, ethically, and innovatively. It aims to support teachers in fostering engaging, student-centered English learning experiences in an increasingly digital world.

1. CHAPTER 1

1. Technology and Ethics in Language Learning

The texts focus on the concept of Computer-Assisted Language Learning (from now, it will be called CALL), exploring its history, evolutionary typologies, and the integration of technology in language teaching. An academic article addresses Blended Learning (BL) as a model that combines face-to-face classes with virtual components, detailing its challenges, pedagogical components, and the need for a well-planned methodological approach. One source is a comprehensive list of applications and websites that serve as practical tools for ESL (English as a Second Language) students and teachers. Finally, research on the adoption of technology by ESL teachers underscores the importance of addressing teachers' concerns and technological literacy to ensure the effective institutionalization of innovations in the classroom.

1.1 Evolution of Computer-Assisted Language Learning (CALL) from its early stages

The development of Computer-Assisted Language Learning (CALL) began in the 1960s, when universities started experimenting with mainframe computers to support language instruction. Over the decades, CALL has evolved through several phases, each reflecting changes in technology and teaching methods.

Behaviorist Phase

The first phase of CALL is known as Behaviorist CALL. It was based on behaviorist theories of learning, which focused on repetition, drills, and memorization. Computers were used mainly to present exercises and provide immediate feedback. Students practiced language patterns through structured programs, and success was measured by their ability to give the "correct" answer.

Communicative CALL Phase (1970s–1980s)

As language teaching moved toward communicative methods, CALL also evolved. This phase emphasized real-life communication, problem-solving,

and meaningful interaction rather than only drills. Computers began to be used to simulate conversations, create interactive exercises, and support language practice in context.

Integrative or Multimedia CALL Phase (1990s–2000s)

With the arrival of personal computers, the internet, and multimedia, CALL became more interactive and engaging. Audio, video, and graphics were integrated into lessons, allowing students to hear native speakers, watch cultural videos, and interact with multimedia exercises. This phase promoted holistic language learning, combining reading, writing, listening, and speaking skills.

Intelligent and AI-Based CALL (2010s–present)

The latest phase incorporates Artificial Intelligence (AI), machine learning, and adaptive technologies. Modern CALL systems can provide personalized learning paths, instant feedback on speaking and writing, and interactive, context-based simulations. Tools like AI chatbots, pronunciation apps, and adaptive quizzes allow learners to practice at their own pace, while teachers can track progress and tailor instruction to individual needs.

CALL has progressed from simple drill-based exercises to complex, AI-supported learning environments. Each phase reflects both technological advances and changes in language teaching philosophy, moving from behaviorist repetition to personalized, communicative, and multimodal learning experiences. This evolution has made language learning more accessible, engaging, and effective for learners worldwide.

Initial Pedagogical Approach

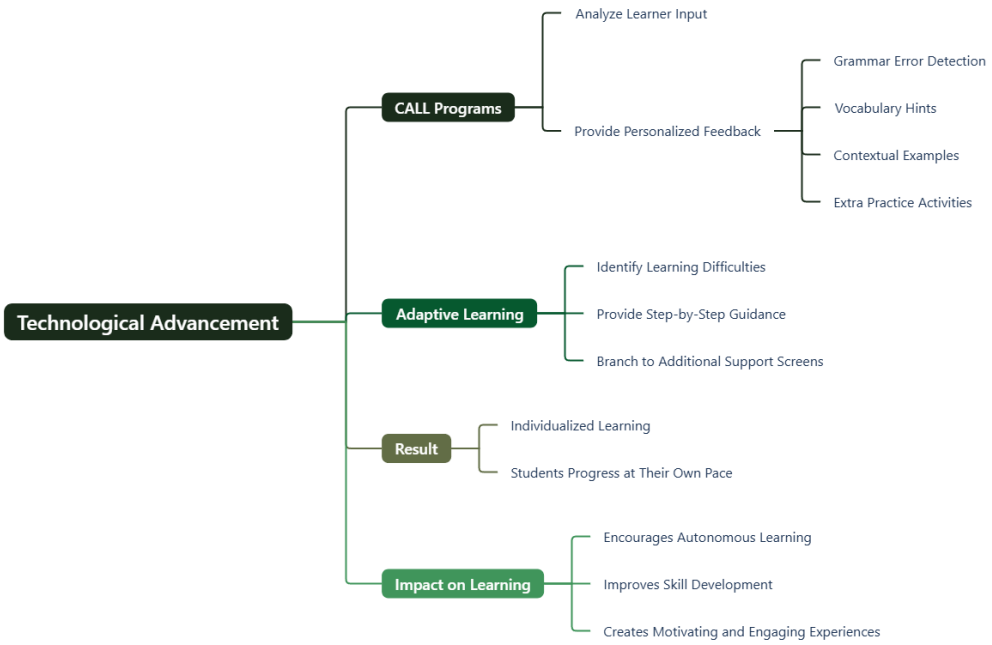
The initial pedagogical approach relied heavily on *drill-and-practice* materials. In this model, the computer functioned primarily as an automated tutor that presented a stimulus—such as a question, prompt, or exercise—and the student

was expected to provide the correct response. Learning activities were repetitive, highly structured, and geared toward memorization and the reinforcement of basic skills.

This approach aligned with behaviorist principles, emphasizing immediate feedback, reinforcement, and incremental skill development. Although effective for practicing routine tasks, it offered limited opportunities for higher-order thinking, problem-solving, or creative engagement. Over time, this model was critiqued for its narrow focus and its tendency to reduce learning to mechanical repetition rather than meaningful understanding.

1.2 Advancement in Computer-Assisted Language Learning (CALL)

Figure 1. Technological Advancement



Source: Author's own elaboration.

As educational technology developed, CALL programs became increasingly sophisticated and intelligent. Early systems only checked whether an answer was right or wrong, offering little guidance beyond simple correction. However, later programs began to analyze the learner's input more deeply, providing tailored feedback based on the type of response.

If a student made a grammar mistake, the software could identify the specific error, explain why it was incorrect, and provide step-by-step instructions to correct it.

If a student struggled with vocabulary, the program could suggest hints, examples in context, or extra practice exercises.

When mistakes occurred, the software could branch to additional support screens, guiding the learner through targeted reinforcement activities.

This adaptive behavior allowed CALL systems to move beyond one-size-fits-all instruction, offering a more individualized and student-centered approach. Students could progress at their own pace, focusing on areas where they needed more practice, rather than repeating content they already mastered.

Research by Suppes & Atkinson (1967) highlighted the potential of these systems to diagnose learning patterns and adjust instruction dynamically, laying the foundation for modern AI-powered language learning tools. Today, this approach is evident in applications that provide personalized grammar exercises, interactive writing feedback, and speaking practice with AI chatbots.

Impact on Learning:

- Encourages autonomous learning, as students receive feedback and guidance without constant teacher intervention.
- Promotes efficient skill development, targeting weaknesses while reinforcing strengths.
- Creates a more engaging and motivating learning experience, as students can see immediate, relevant support for their individual needs.

This evolution marked a significant shift in CALL from static drill-based programs to dynamic, adaptive learning environments, setting the stage for the integration of AI, analytics, and multimodal technologies in language education today.

- **Decline**

Although these programs and their underlying pedagogy still exist today, behavioristic approaches to language learning have been largely rejected by most language teachers (Warschauer, 2000). As communicative and constructivist theories gained prominence, educators increasingly criticized drill-based systems for oversimplifying language acquisition and failing to reflect the social, interactive, and meaningful nature of real communication. Recognizing these limitations, Warschauer later revisited this early stage of computer-assisted language learning and labeled it the *Structural CALL* phase, which he situated in the late 1970s through the 1980s (Warschauer, 2000).

1.3 Communicative Phase (Communicative CALL)

The late 1970s and early 1980s saw a major shift in Computer-Assisted Language Learning (CALL) with the rise of microcomputers. Unlike the large, expensive mainframe computers of earlier decades, microcomputers were smaller, more affordable, and easier for schools and individual students to access. This change democratized computing, opening new possibilities for educators to experiment with language teaching using technology.

During this period, CALL moved beyond behaviorist drills and repetition to focus on meaningful communication and interactive learning. The Communicative CALL phase emphasized the use of language in context, encouraging learners to practice real-life communication skills rather than only memorizing grammatical patterns.

Key characteristics of Communicative CALL include:

Interactive exercises: Students engaged in simulations of real-life situations, such as ordering food, making travel arrangements, or holding simple conversations.

Problem-solving tasks: Learners completed activities that required collaboration, critical thinking, and authentic language use, such as planning a trip or solving a puzzle in English.

Contextualized learning: Language was presented within meaningful contexts, helping students understand not only vocabulary and grammar but also pragmatic and cultural usage.

Feedback and guidance: Although less adaptive than modern AI systems, early communicative programs provided immediate responses, helping learners reflect on their answers and improve their language skills.

Impact of Microcomputers:

Teachers could now integrate computers into everyday lessons rather than reserving them for special labs.

Students had more opportunities for self-directed practice, promoting autonomy and engagement.

CALL software began to support pair work, group projects, and classroom interaction, aligning with the principles of communicative language teaching.

Research by Warschauer (2000) highlights how this period marked a shift from teacher-centered drills to learner-centered, communication-focused activities.

The innovations of the Communicative CALL phase set the stage for multimedia CALL in the 1990s and, later, the AI-driven, adaptive CALL environments of the 21st century.

Classroom Example:

A teacher could use a microcomputer program where students simulate a restaurant scenario. The computer provides the menu and typical phrases, students take turns ordering and responding, and the software gives immediate feedback on correctness and vocabulary usage. This approach makes language practice interactive, engaging, and relevant to real-life situations.

- **Pedagogical Approach**

The pedagogical foundations of this second phase—commonly known as Communicative CALL—were grounded in the principles of Communicative

Language Teaching (CLT), which was rapidly gaining dominance within language education. Departing from the rigid, behaviorist models of the earlier structural phase, this new approach emphasized language use over language form, and communication over repetition. Learners were encouraged to engage in tasks that resembled real-world communication, such as negotiating meaning, expressing personal ideas, and interacting with texts in flexible and creative ways.

In this context, grammar was no longer presented as a set of isolated rules to be memorized and practiced through controlled drills. Instead, it was introduced implicitly, embedded in meaningful communicative activities. Students were expected to notice patterns, infer rules, and develop linguistic intuition through exposure and use. This shift supported greater originality, personalization, and fluency in learners' language production (Warschauer, 2000).

Moreover, the teacher's role evolved from a dispenser of correct answers to a facilitator who encouraged exploration, guided learners' communicative efforts, and created language-rich scenarios in which computers served as tools rather than tutors.

- **Technology**

The Communicative Phase coincided with the widespread arrival of the Personal Computer (PC). Compared with earlier mainframes, PCs offered:

- Improved processing power, enabling more dynamic interaction
- Greater availability, allowing classrooms to host multiple machines
- User-friendly interfaces, which encouraged experimentation
- Compatibility with emerging commercial and educational software

These technological advances supported the development of applications that were more flexible, less linear, and capable of fostering exploratory learning rather than repetitive stimulus–response routines (Warschauer, 2000).

- **Software**

Software in the Communicative CALL era continued to provide practice opportunities but did so through non-drill formats that aligned more closely with communicative pedagogy. Common examples included:

- Language games, which required learners to interpret clues, make decisions, and engage in playful interaction using the target language
- Text reconstruction programs, where students pieced together scrambled texts, promoting reading comprehension, contextual inference, and awareness of discourse
- Rhythmic or paced reading tools, which encouraged fluent reading through timed exposure and focus on meaning
- Open-ended simulations, in which learners made choices and observed consequences, integrating language with problem-solving and exploration

Notably, educators also began to adopt commercial software not originally intended for language learning, such as *SimCity*, *The Oregon Trail*, or simple adventure games. These programs created immersive environments rich in text, decision-making, and meaningful interaction, allowing teachers to design communicative tasks around authentic use of language (Warschauer, 2000).

This repurposing of non-language software reflected a growing belief that communication involves not only linguistic forms but also real-world contexts, goals, and problem-solving activities.

1.4 Integrative Phase (Integrative CALL)

The third phase of Computer-Assisted Language Learning, known as Integrative CALL, emerged during the 1990s as a response to the limitations of the communicative approach. Educators began seeking ways to create more coherent, meaningful, and contextually rich learning environments by integrating all language skills into extended projects, tasks, and content-based activities, rather than treating reading, writing, listening, and speaking as isolated components. This phase emphasized authenticity, interdisciplinarity,

and learner agency, marking a shift toward more holistic models of language learning (Warschauer & Healey, 1998).

Key Technology

The Integrative Phase coincided with two major technological developments:

1.4.1. Multimedia computing

Figure 2. Multimedia Computing – Computer-Mediated Communication (CMC)

Source: Author's own elaboration.

Computer-Mediated Communication (CMC)

In the 1990s and early 2000s, the rise of the internet and networked technologies led to the development of Computer-Mediated Communication (CMC) in language learning. Unlike earlier CALL programs, which focused mainly on drills and isolated exercises, CMC positioned computers as tools for communication, collaboration, and knowledge construction.

Key Features of CMC:

- **Interactive Platforms:** Students could use email, chatrooms, discussion boards, and forums to communicate with teachers and classmates.
- **Collaborative Learning:** Learners worked together on projects, shared ideas, and co-constructed knowledge rather than only following instructions from a computer program.

- **Extended Learning Environments:** CMC allowed language learning to happen beyond the classroom walls, connecting students with peers in other schools, countries, or cultures.

Pedagogical Shift:

- Computers were no longer authoritative tutors that simply checked answers. Instead, they became interactive platforms that facilitated dialogue, cooperation, and problem-solving.
- Teachers could design tasks that encouraged negotiation of meaning, such as group writing projects, online discussions, or peer feedback activities.
- Students learned to communicate meaningfully, using authentic language in real contexts rather than practicing isolated grammar rules.

Impact on Language Learning:

- Promoted learner autonomy, as students could interact online anytime and anywhere.
- Encouraged critical thinking and reflection, as learners needed to compose messages, respond thoughtfully, and consider multiple perspectives.
- Introduced real-world relevance, as students used the same digital tools and language skills they might encounter outside school.

Classroom Example:

A teacher might organize a pen-pal project using email or a secure online platform. Students in different countries exchange messages in English, discuss cultural topics, and collaborate on a shared document. The computer becomes a mediator for authentic communication, and students practice writing, reading, and cross-cultural interaction simultaneously.

According to Warschauer & Healey (1998), this transition represented a fundamental shift in CALL, turning computers from closed instructional systems

into open, interactive environments that support social interaction and meaningful learning.

1.4.2. Multimedia

In the early 1990s, the development of multimedia computing marked a significant breakthrough in Computer-Assisted Language Learning (CALL). Before this period, early multimedia CALL programs relied on interactive laser videodiscs, which combined synchronized video and audio with on-screen text. These programs allowed students to watch and listen while completing exercises, but access was limited by hardware requirements and high costs. Later, these programs were transferred to CD-ROMs, making them more portable and affordable, and eventually replaced by web-based multimedia platforms, which offered greater flexibility, accessibility, and interactive possibilities.

Key Features of Multimedia CALL:

- Integration of Multiple Modalities: Teachers and students could combine text, images, audio, video, animation, and interactive exercises in a single learning environment.
- Support for All Language Skills: Multimedia CALL enabled learners to practice listening, speaking, reading, and writing in an integrated way. For example, students could listen to a dialogue, read a transcript, record their own voice, and answer comprehension questions all in one platform.
- Nonlinear Exploration: Learners were no longer restricted to a linear sequence of drills. They could explore materials in different orders, repeat activities as needed, and focus on areas requiring more practice, fostering autonomy and personalized learning.

Pedagogical Advantages:

- Enhanced Engagement: Combining visual, auditory, and textual input made lessons more engaging and appealing for learners.
- Realistic Contexts: Videos, animations, and simulations provided authentic language situations, helping students understand cultural and pragmatic aspects of English.
- Active Learning: Interactive features allowed students to respond, record, and receive feedback, promoting active participation rather than passive observation.

Classroom Example:

A multimedia CALL lesson might include a video of a restaurant conversation. Students watch the dialogue, read subtitles, complete comprehension questions, and record themselves practicing the same scenario. The program provides instant feedback on pronunciation and vocabulary, while students can replay or explore additional scenarios, creating a dynamic, immersive learning experience.

According to Warschauer & Healey (1998), multimedia CALL redefined the possibilities of technology in language learning, moving beyond drills and exercises toward rich, multisensory, interactive experiences that integrate all language skills and make learning more authentic and motivating.

1.4.3. Internet in CALL

The emergence of the World Wide Web in the early 1990s marked a major turning point for Computer-Assisted Language Learning (CALL). The Web created a global hypertext system, allowing teachers and students to access authentic language materials from around the world. Suddenly, learning was no longer limited to textbooks, CDs, or preprogrammed software—students could explore foreign-language websites, online newspapers, videos, podcasts, and educational platforms.

Key Features and Advantages:

- Access to Authentic Materials: Learners could read real-world articles, watch news broadcasts, or listen to podcasts in the target language, helping them understand natural discourse, idiomatic expressions, and cultural context.
- Exposure to Communities of Practice: The Web enabled learners to interact with native speakers, join online forums, participate in language exchanges, and engage in meaningful communication beyond the classroom.
- Resource-Rich Learning Environment: Teachers could integrate multimedia, hyperlinks, and online exercises into lessons, creating flexible and personalized learning paths.
- Global Collaboration: Students could collaborate on projects with peers in other countries, sharing ideas, editing joint documents, and practicing communication skills in authentic contexts.

Pedagogical Shift:

The Web transformed CALL from a closed, teacher-centered environment into a dynamic, learner-centered window onto the world. Instead of relying solely on drills or programmed exercises, students could explore, discover, and practice language in meaningful, real-world contexts. This shift encouraged autonomy, engagement, and cultural awareness.

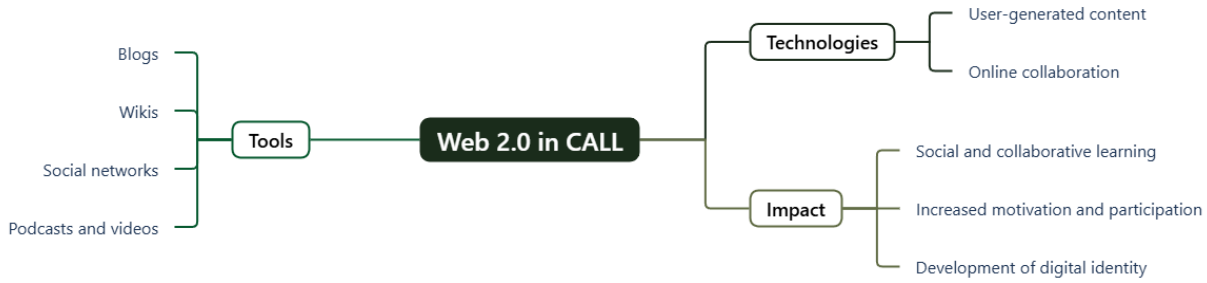
Classroom Example:

A teacher might assign a task where students read online news articles from English newspapers, summarize the main points, and then discuss them in small groups using a video conferencing tool. Alternatively, students could participate in an international pen-pal project, writing emails or blog posts and receiving feedback from peers worldwide. These activities allow learners to practice reading, writing, and digital communication skills simultaneously.

According to researchers, the Internet phase of CALL significantly broadened the scope of language learning, providing authentic input, real communication opportunities, and access to global resources (Warschauer & Healey, 1998). It laid the foundation for modern online learning platforms, MOOCs, and AI-supported web-based learning environments.

1.4.4. Web 2.0 in CALL

Figure 3. Web 2.0 in CALL



Source: Author's own elaboration.

Since the early 2000s, the emergence of Web 2.0 technologies transformed Computer-Assisted Language Learning (CALL) by emphasizing interactivity, user-generated content, and social collaboration. Unlike the early Web, which focused mainly on accessing information, Web 2.0 allowed learners to actively participate, create content, and interact with others online, fundamentally changing how language learning could occur.

Key Features of Web 2.0 in Language Learning:

- **Blogs:** Students could write reflections, journals, or short essays in the target language, receiving feedback from peers or teachers. This supported writing fluency, self-expression, and metacognitive development.

- **Wikis:** Collaborative platforms allowed learners to co-author documents, build knowledge collectively, and edit content together, promoting teamwork, negotiation of meaning, and awareness of language accuracy.
- **Social Networks:** Platforms like Facebook, Twitter, or specialized educational networks enabled students to communicate with native speakers or learners worldwide, participate in discussions, and practice authentic digital communication.
- **Podcasting and Video Sharing:** Learners could create or listen to podcasts and videos, improving listening comprehension, pronunciation, and speaking production through multimodal input.

Pedagogical Implications:

- Web 2.0 tools align with constructivist and socio-cognitive approaches, emphasizing that learning is an active, social process.
- Learners are encouraged to produce content, negotiate meaning with peers, and develop digital identities in the target language.
- These technologies promote learner autonomy, engagement, and motivation, as students have opportunities to contribute, interact, and see the real-world relevance of their language skills.

Classroom Example:

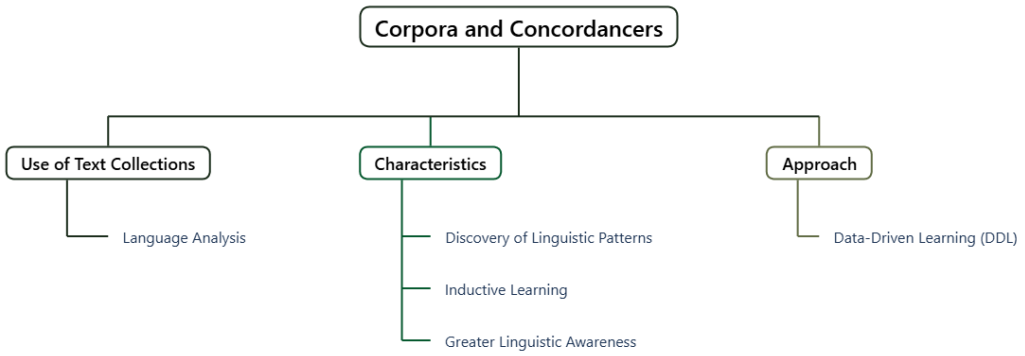
A teacher might assign a project where students create a collaborative travel wiki. Each student writes about a different city, adds images or videos, and provides travel tips. Peers edit and comment on each entry, practicing writing, reading, and cultural awareness. Alternatively, students might produce a short podcast describing a daily routine, then share it with classmates for peer feedback.

Impact on CALL:

Web 2.0 marked a shift from teacher-centered to learner-centered approaches, turning the computer into a social, collaborative, and creative tool. By allowing students to interact, co-create, and share knowledge, Web 2.0 technologies laid the foundation for modern collaborative platforms, online communities, and AI-integrated learning environments.

1.4.5. Corpora and Concordancers

Figure 4 Corpora and Concordance



Source: Author's own elaboration.

In the late 1990s and 2000s, the integration of corpora and concordancing tools became a significant innovation in Computer-Assisted Language Learning (CALL). A corpus is a large collection of authentic texts in a target language, which can include books, articles, transcripts, or spoken data. Concordancers are software tools that allow learners to search these corpora for patterns, examples, or specific language forms.

This approach gave rise to Data-Driven Learning (DDL), in which learners explore real language use directly, rather than relying solely on teacher explanations or textbooks. By examining authentic texts, students can identify vocabulary usage, grammatical structures, collocations, and pragmatic patterns, making learning more meaningful and evidence-based.

Key Features of Corpora and Concordancers:

- **Pattern Discovery:** Students can observe how words and structures are used in context, e.g., common collocations, verb tenses, or idiomatic expressions.
- **Inductive Learning:** Rather than being told rules explicitly, learners draw conclusions from authentic examples, promoting critical thinking and deeper understanding.
- **Learner Autonomy:** Concordancers allow students to investigate language independently, choosing topics or structures of personal interest.
- **Enhanced Linguistic Awareness:** Repeated exposure to authentic data helps learners notice frequency, variation, and contextual usage, improving both comprehension and production skills.

Pedagogical Applications:

- Teachers can design tasks where students search a corpus for verb patterns and then create original sentences using those patterns.
- Learners might explore collocations with specific adjectives or verbs, comparing formal vs. informal usage.
- Concordancers can also support writing and editing, as students verify how certain words or phrases are used in real contexts.

Classroom Example:

A teacher asks students to investigate how the word "make" is used in English. Using a concordancer, students find sentences like "make a decision," "make an effort," and "make money." They then categorize these phrases, practice using them in their own sentences, and share findings with the class. This activity helps learners see authentic usage, understand nuances, and apply language creatively.

Impact on CALL:

The use of corpora and concordancers marked a shift toward data-driven, research-informed learning, empowering students to become active investigators of language. This approach complements other CALL methodologies, integrating technology with critical thinking, linguistic analysis, and learner autonomy (Johns & King, 1991).

1.4.6. Virtual Worlds

Figure 5 Virtual Worlds

Source: Author's own elaboration.

Since the early 2000s, virtual worlds have become an exciting development in Computer-Assisted Language Learning (CALL). These digital environments range from text-based platforms like MUDs (Multi-User Dungeons) and MOOs (MUDs Object-Oriented) to graphical 3D worlds such as Second Life (launched in 2003). They offer immersive, interactive spaces where learners can practice language in socially meaningful and contextualized scenarios.

Key Features of Virtual Worlds:

- **Avatars and Role-Play**: Students create digital representations (avatars) and interact with peers or teachers in realistic or imaginative settings.
- **Simulated Environments:** Learners can explore virtual cities, classrooms, shops, or workplaces, providing opportunities to practice language relevant to real-life contexts.

- **Social Interaction:** Virtual worlds enable collaborative tasks, dialogues, and group projects, encouraging communication in a safe, low-stress environment.
- **Experiential Learning:** Learners gain practical, context-based experience with language, combining speaking, listening, reading, and writing in dynamic activities.

Pedagogical Implications:

- Virtual worlds support experiential and socially situated learning, emphasizing learning by doing rather than passive study.
- Teachers can design role-play scenarios, such as ordering food in a restaurant, attending a job interview, or negotiating in a marketplace.
- These environments also foster digital literacy and 21st-century skills, as students navigate avatars, interactive objects, and collaborative tasks.

Classroom Example:

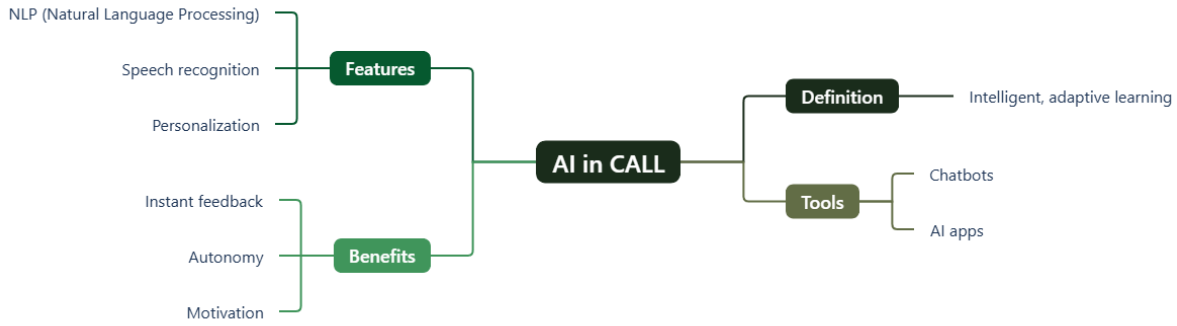
A teacher might create a virtual town in Second Life where students must complete tasks such as buying groceries, asking for directions, or attending a virtual class. Students communicate using voice or text chat, negotiate meaning, and collaborate to solve problems. After the session, learners reflect on language use, strategies, and errors, enhancing metacognitive awareness.

Impact on CALL:

Virtual worlds expanded the possibilities of CALL by providing immersive, interactive, and socially meaningful experiences that are difficult to replicate in traditional classrooms. They highlight the potential of experiential, situated, and collaborative learning, bridging the gap between virtual practice and real-world language use (Warshauer, 2000).

1.5. The Evolution Toward Artificial Intelligence (AI)

Figure 6. The Evolution Toward Artificial Intelligence (AI)



Source: Author's own elaboration.

A recent stage in the evolution of Computer-Assisted Language Learning (CALL) is the integration of Artificial Intelligence (AI) and Human Language Technologies (HLT). These technologies go beyond traditional software by enabling computers to process, understand, and generate human language in increasingly sophisticated ways. This shift transforms CALL from static or preprogrammed exercises into adaptive, interactive, and intelligent learning environments.

Key Features of AI in Language Learning:

- **Natural Language Processing (NLP):** AI can analyze student input, detect errors in grammar, syntax, and vocabulary, and provide explanations or corrections.
- **Speech Recognition and Synthesis:** Learners can practice speaking and pronunciation, receiving instant feedback, while text can be converted to natural-sounding speech for listening exercises.
- **Syntactic and Semantic Analysis:** AI can understand the meaning of sentences, enabling more context-aware feedback, summarization, or content generation.
- **Adaptive Learning:** AI systems can personalize tasks, quizzes, and activities based on the learner's level, strengths, and weaknesses.

- **Interactive Tools:** AI can simulate conversations, generate role-play dialogues, and create multimodal learning materials (text, audio, images, video) tailored to learners' needs.

Pedagogical Implications:

- AI supports learner autonomy by providing on-demand guidance, instant feedback, and personalized pathways.
- Teachers can focus on higher-order instruction, using AI to handle repetitive or individualized tasks such as grammar correction, vocabulary exercises, or pronunciation practice.
- AI promotes engagement and motivation by creating interactive, realistic, and context-rich learning experiences.

Classroom Example:

- Students use an AI-powered app such as ChatGPT or Elsa Speak to practice speaking and receive feedback on pronunciation, fluency, and grammar.
- A teacher assigns AI-generated writing prompts, and students draft responses, then use AI tools to analyze sentence structures, suggest improvements, and refine vocabulary.
- In a blended learning environment, learners can interact with AI chatbots for simulated conversations, while the teacher monitors progress and facilitates reflective discussion.

Impact on CALL:

The integration of AI represents a major transformation in language learning, moving from behaviorist drills and static exercises toward intelligent, adaptive, and interactive learning systems. AI enables real-time feedback, personalized instruction, multimodal content, and immersive interaction, laying the groundwork for the future of CALL in digital, remote, and hybrid learning contexts (Chapelle & Sauro, 2017).

Intelligent CALL (ICALL)

Intelligent Computer-Assisted Language Learning (ICALL) represents the latest stage in the evolution of CALL, building on Artificial Intelligence (AI) techniques to create adaptive, responsive, and human-like learning environments. Unlike conventional CALL programs that simply mark answers as correct or incorrect, ICALL systems analyze learners' input, interpret intentions, and provide context-sensitive feedback.

Key Features of ICALL:

- **Error Diagnosis:** ICALL can detect not only grammatical or spelling mistakes but also patterns of recurring errors, helping learners understand the underlying causes.
- **Context-Aware Feedback:** Feedback is adapted to the learner's level, task type, and communicative context, offering suggestions, explanations, or examples tailored to individual needs.
- **Adaptive Learning Paths:** Based on student performance, ICALL systems recommend personalized exercises, additional practice, or alternative learning strategies.
- **Natural Language Processing (NLP):** Enables the system to understand complex learner input, including sentence structure, word choice, and semantic meaning.
- **Machine Learning Integration:** ICALL systems improve over time by learning from aggregated learner data, making feedback increasingly precise and relevant.

Pedagogical Implications:

- ICALL supports learner autonomy, allowing students to work independently while receiving intelligent guidance.
- Teachers can focus on higher-order instructional tasks, such as discussion facilitation, error analysis, and communicative practice, while ICALL handles individualized feedback.

- The system encourages metacognitive awareness, as learners can review detailed explanations, understand mistakes, and reflect on language patterns.

Classroom Example:

- A student writes an essay in English. The ICALL system identifies frequent misuse of verb tenses, explains the rules, and generates targeted exercises to correct these errors.
- During speaking practice, an ICALL app analyzes pronunciation, intonation, and stress patterns, then provides visualizations and practice recommendations.
- In a blended learning course, ICALL can monitor learner progress, adapt tasks in real time, and generate reports for both students and teachers, enhancing both feedback and planning.

Impact on CALL:

ICALL represents a major advancement toward personalized, intelligent language learning. By combining AI, NLP, and machine learning, ICALL systems provide a more human-like, informative, and adaptive experience. They enhance accuracy, engagement, and learner independence, moving CALL closer to a model in which computers act as intelligent tutors and collaborators rather than passive tools (Chapelle & Sauro, 2017).

1.6 AI-Driven Learning

AI has revolutionized language education by enabling personalized and adaptive learning, where instruction adjusts automatically to each learner's needs, pace, and proficiency level. Modern AI-driven systems include:

- Virtual tutors capable of guiding learners through individualized lessons.
- Intelligent chatbots that use NLP to simulate realistic conversational practice.

- Automated speech-recognition tools that evaluate pronunciation and fluency dialogue systems that adapt dynamically to students' linguistic performance

These innovations offer immediate feedback, continuous assessment, and authentic communicative interaction—benefits that were previously unattainable with traditional CALL tools (Chapelle & Sauro, 2017).

- **Ethical and Privacy Challenges**

As Artificial Intelligence (AI) and Intelligent CALL (ICALL) become more integrated into language education, new ethical, privacy, and fairness concerns arise. While AI provides personalized feedback, adaptive learning, and interactive experiences, educators and developers must remain vigilant about how AI processes data and influences learning outcomes.

Key Challenges:

1. **Algorithmic Bias:**
    - ✓ AI systems are trained on large datasets, which often reflect dominant languages, accents, or cultural norms.
    - ✓ Speakers of underrepresented dialects or languages may experience less accurate feedback or disadvantages in assessment.
    - ✓ Educators must critically evaluate AI outputs and teach learners to recognize potential biases.

2. **Data Security and Privacy:**
    - ✓ AI platforms frequently collect voice recordings, written text, and interaction logs to improve performance.
    - ✓ If stored improperly, these data can be vulnerable to breaches, unauthorized access, or misuse.

- ✓ Schools and developers must implement robust privacy safeguards, anonymize data when possible, and comply with regulations like GDPR or COPPA.

3. **Lack of Transparency:**
   - ✓ Many AI systems function as "black boxes", meaning it is unclear how decisions or evaluations are made.
   - ✓ Teachers and learners may not understand why AI provides certain corrections or recommendations, which can undermine trust and learning outcomes.
   - ✓ Promoting AI literacy among educators and students helps them critically assess system outputs.

Pedagogical Implications:

- ✓ Teachers should **monitor AI-generated feedback**, intervene when errors or biases occur, and encourage **reflective learning**.
- ✓ Instruction should include **digital citizenship and ethical AI use**, helping students navigate online learning responsibly.
- ✓ AI should be treated as a **support tool**, not a replacement for human judgment, to ensure fairness, inclusivity, and ethical integrity.

Classroom Example:

- In a language lab, students use an AI pronunciation tool. The teacher notices that the system misinterprets certain accents.
- Instead of solely relying on AI corrections, the teacher provides human feedback, explains potential biases, and encourages students to compare AI suggestions with authentic language sources.
- Students reflect on how AI works, how data is used, and why human oversight remains essential, fostering critical thinking and responsible technology use.

Impact on AI in CALL:

Ethical and privacy considerations are essential for sustainable, inclusive, and effective AI integration. Addressing bias, protecting data, and promoting transparency ensure that AI-based language learning supports all learners fairly while maintaining trust and educational integrity.

- **Future Models**

The responsible future of AI in language education requires:

- Explainable AI (XAI), which clarifies how decisions are made fairness-aware algorithms, designed to reduce biases in training data and model outputs
- robust data-protection mechanisms, ensuring the security and privacy of learners' information

Many scholars argue that the most sustainable path forward is a hybrid model, in which AI tools support—but do not replace—human instructors. In this model, teachers maintain pedagogical control and provide empathy, cultural expertise, and ethical oversight, while AI handles personalization, feedback, and interaction at scale (Chapelle & Sauro, 2017).

1.7 Computer-Assisted Language Learning (CALL)

Computer-Assisted Language Learning (CALL) refers to the study, design, and application of computer technologies to support the teaching and learning of languages. It is both a research field—exploring how digital tools can enhance language acquisition—and a practical approach, encompassing software, platforms, and intelligent systems used in classrooms and online learning environments.

CALL covers a wide spectrum of tools and pedagogical strategies, ranging from basic drill-and-practice programs to interactive multimedia applications, online communication platforms, virtual worlds, and AI-driven systems. Its evolution has been closely tied to advances in Information and Communication

Technologies (ICT), which provide opportunities for more interactive, adaptive, and learner-centered experiences.

Scope of CALL:

- **Behaviorist/Structural Tools:** Early CALL focused on repetitive exercises, such as vocabulary drills and grammar practice, providing immediate feedback on correct or incorrect answers.
- **Multimedia and Interactive Applications:** Later developments integrated text, audio, images, and video, allowing learners to engage with language in rich, multisensory contexts.
- **Online and Collaborative Tools:** The rise of the Internet and Web 2.0 enabled computer-mediated communication (CMC), blogs, wikis, and virtual classrooms, fostering collaboration and exposure to authentic language use.
- **AI-Enhanced Systems and ICALL:** The latest stage involves Intelligent CALL, where systems use natural language processing, machine learning, and speech technologies to analyze learner input, provide personalized feedback, and create adaptive learning paths.

Significance of CALL:

- CALL supports learner autonomy by allowing independent practice outside the classroom.
- It enables personalized instruction, adapting to learners' levels, needs, and interests.
- CALL fosters engagement and motivation through gamified, interactive, and context-rich activities.
- It allows access to authentic language and cultural materials from around the world.
- Ethical and privacy considerations remain crucial, particularly in AI-enhanced learning environments.

CALL is not a static methodology but a dynamic, evolving field that reflects the intersection of technology, pedagogy, and language acquisition research. Its ultimate goal is to enhance the effectiveness, accessibility, and enjoyment of language learning, helping learners develop linguistic skills in increasingly flexible and meaningful ways.

1.8 Terminology and Evolution of the Concept

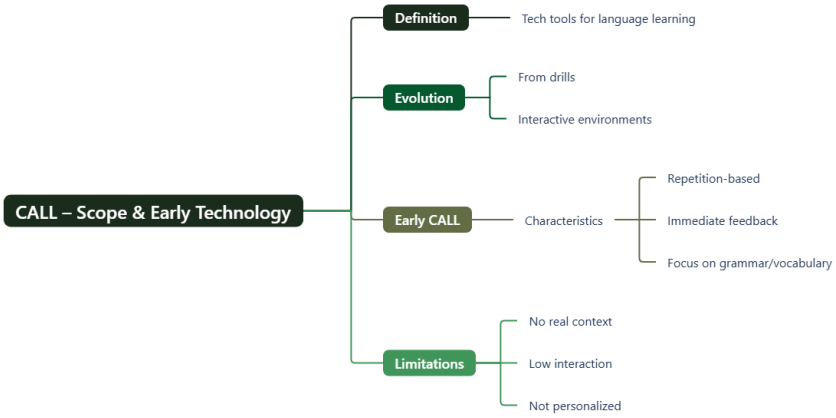
The term CALL (Computer-Assisted Language Learning) began to replace CALI (Computer-Aided Language Instruction) in the early 1980s (Warschauer, 2000). The decline of CALI among language teachers was largely due to its perceived emphasis on teacher-centered instruction, which contrasted with the growing preference for learner-centered approaches that focused on learning rather than merely delivering instruction. CALL, by emphasizing the active role of the learner, better reflected these evolving pedagogical priorities.

Several related terms have also been used in the broader context of educational technology. CAL (Computer-Assisted Learning), commonly used in British English, and CAI (Computer-Aided Instruction), more typical in American English, represent general approaches to computer-supported education, with CALI considered a subset of the broader CAI framework (Levy, 1997). Around the 1990s, a new term emerged: Technology-Enhanced Language Learning (TELL), which emphasized the integration of multiple technological tools and digital resources to enrich language instruction, rather than relying solely on computer-based drills or tutorials (Warschauer, 2000).

Overall, the evolution of terminology reflects broader pedagogical shifts—from teacher-directed instruction toward interactive, learner-centered, and technology-mediated approaches—and underscores the increasing role of digital technologies in shaping how languages are taught and learned.

1.8.1 Scope and Technology of CALL

Figure 7. Scope and Technology of CALL



Source: Author's own elaboration.

The scope of Computer-Assisted Language Learning (CALL) is broad and has evolved considerably since its inception. From simple drill-based programs to sophisticated, interactive digital environments, CALL encompasses a wide array of technologies and pedagogical approaches aimed at enhancing language learning.

Traditional Programs

The earliest phase of Computer-Assisted Language Learning (CALL) was dominated by drill-and-practice programs, which emerged in the 1960s and 1970s alongside the first mainframe and minicomputers available in universities and research institutions. These programs were grounded in behaviorist theories of learning, emphasizing repetition, reinforcement, and habit formation as primary methods for acquiring language skills.

Key Characteristics:

- **Structured Practice:** Learners were presented with a stimulus (e.g., a sentence, word, or sound) and prompted to provide a fixed response, often through multiple-choice selections, typed answers, or speech input.
- **Immediate Feedback:** The system indicated whether responses were correct or incorrect, reinforcing learning through repetition.
- **Focus on Discrete Skills:** These programs targeted specific language elements such as vocabulary lists, verb conjugations, pronunciation drills, or sentence structure exercises.
- **Limited Interactivity:** Learners interacted only with the computer, with no opportunity for authentic communication or collaborative tasks.
- **Non-Contextualized Learning:** Language items were often isolated from meaningful real-life contexts, making transfer to practical use challenging.

Example Activity:

- A student practices the past tense of irregular verbs. The program displays a verb like "go," and the student types "went." The system immediately marks it correct or incorrect, then presents the next verb.

Strengths and Limitations:

- **Strengths:** Drill-and-practice CALL was effective for memorization, reinforcement, and consistent practice of discrete elements. It provided structured, predictable learning opportunities and immediate corrective feedback.
- **Limitations:** The approach offered little communicative value, lacked contextualized or interactive learning, and did not adapt to individual learner needs. It treated language as a set of isolated rules rather than a dynamic medium for real communication (Warschauer, 2000).

Despite its limitations, traditional CALL laid the foundation for later developments in interactive, communicative, and adaptive computer-assisted language learning, demonstrating the potential of computers as educational tools and setting the stage for multimedia and AI-enhanced systems.

1.8.2. Modern Learning Environments

In contrast to the early drill-and-practice CALL programs, modern CALL environments leverage the full capabilities of contemporary technology to provide interactive, learner-centered, and communicative experiences. Advances in internet connectivity, multimedia, and mobile technologies have transformed language learning from a repetitive, isolated task into a dynamic, context-rich, and globally connected process.

Key Features:

- **Virtual Learning Environments (VLEs):** Platforms such as Moodle, Blackboard, or Canvas organize courses, assignments, and assessments in a centralized online space. They support both asynchronous learning, where students access materials at their own pace, and synchronous learning, such as live video lessons or discussions.

Web-Based Distance Learning: Tools like Duolingo, BBC Learning English, and Coursera provide flexible access to language instruction, combining adaptive exercises, authentic content, and interactive features. Students can practice reading, writing, listening, and speaking from anywhere in the world.

- **Interactive Multimedia Systems:** Modern CALL integrates text, images, audio, video, animations, and interactive tasks to create immersive, multisensory experiences. For example, a virtual tour of a city may include reading signs, listening to dialogues, and completing comprehension tasks.

- **Authentic Materials:** Learner's access real-world content such as news articles, podcasts, videos, and social media posts, helping them engage with genuine language use and cultural contexts.
- **Collaborative Learning**: Digital platforms enable interaction among learners, teachers, and native speakers worldwide through discussion boards, wikis, chat tools, and video conferencing, fostering communicative competence and cross-cultural awareness.

Example Activity:

- A class studies environmental issues in English. Students:
- Watch a video news report online.
- Summarize the content in a collaborative Padlet board.
- Discuss opinions in small groups via a Zoom breakout room.
- Submit a reflective essay using Moodle, receiving AI-assisted grammar feedback before final submission.

Benefits:

- Promotes learner autonomy, allowing students to manage their learning paths.
- Encourages real-world communication and collaborative problem-solving.
- Provides access to rich, authentic, and diverse language input.
- Supports adaptive and differentiated instruction, responding to learner levels and needs.

Modern CALL environments represent a shift from isolated, behaviorist approaches to interactive, learner-centered, and globally connected experiences. They combine technological sophistication, pedagogical flexibility, and authentic communication opportunities, preparing learners to use language effectively in real-life contexts.

1.8.3. Tools and Applications

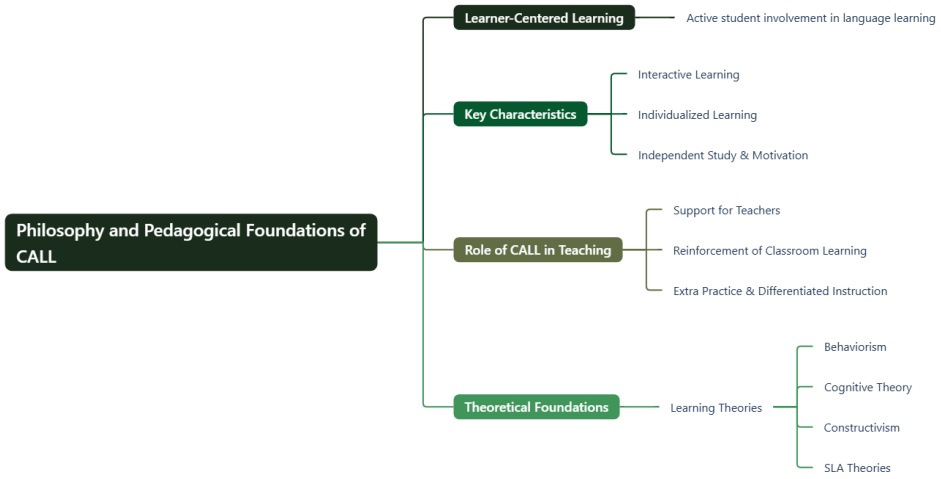
The technological scope of CALL has expanded to include a variety of tools and applications, such as:

- Corpora and concordancers, which allow learners to analyze authentic language data and explore patterns in vocabulary and grammar (Data-Driven Learning, or DDL)
- Interactive whiteboards, which support collaborative classroom activities and multimodal interaction
- Computer-Mediated Communication (CMC), including discussion forums, chat, and videoconferencing for authentic interaction
- Virtual worlds and 3D environments, providing immersive contexts for language practice
- Mobile-Assisted Language Learning (MALL), leveraging smartphones and tablets to enable learning anytime and anywhere

These technologies collectively reflect the transition from teacher-centered, drill-based instruction to learner-centered, interactive, and contextually rich language learning. Modern CALL environments not only facilitate the acquisition of language skills but also foster critical thinking, collaboration, and learner autonomy (Warschauer & Healey, 1998).

1.9 Philosophy and Pedagogical Foundations

Figure 8. Philosophy and Pedagogical Foundations of CALL



Source: Author's own elaboration.

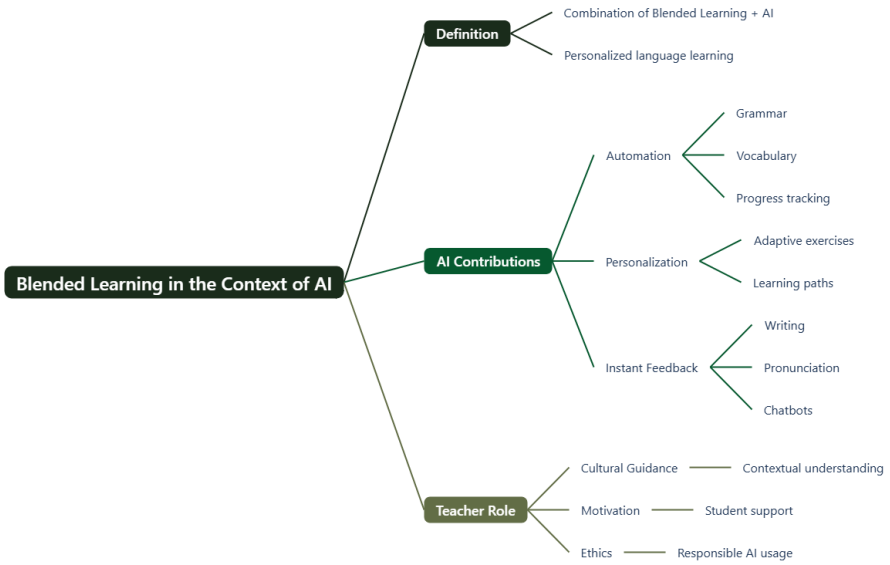
The contemporary philosophy of Computer-Assisted Language Learning (CALL) emphasizes learner-centered materials that empower students to take an active role in their language learning. CALL resources are designed to encourage independent study while maintaining engagement and motivation. Two key characteristics of these materials are interactive learning, which fosters active participation, and individualized learning, which adapts to the learner's proficiency level, pace, and needs (Levy, 1997; Warschauer & Healey, 1998). CALL also serves as a tool to assist teachers in facilitating language learning, whether by reinforcing in-class lessons, providing additional practice, or supporting differentiated instruction. The design of CALL materials integrates pedagogical principles and language teaching methodology, drawing on multiple theoretical frameworks, including:

- Behaviorism, emphasizing structured practice and reinforcement
- Cognitive theory, highlighting the processing and internalization of linguistic information
- Constructivism, focusing on learner-centered discovery and knowledge construction

- Second language acquisition theories, which inform task-based learning, input enhancement, and interactional approaches

1.9.1 Blended Learning

Figure 9. Blended Learning



Source: Author's own elaboration

In contemporary language education, CALL is frequently integrated with traditional classroom instruction, creating a blended learning environment. This approach combines the flexibility, interactivity, and personalization offered by digital technologies with the social interaction, guidance, and immediacy of face-to-face teaching.

Key Features of Blended Learning:

1. **Integration of Online and Offline Activities:** Students may complete interactive exercises, quizzes, and multimedia tasks online while participating in discussion, group work, and teacher-led activities in the classroom.
2. **Flexible Access and Pacing:** Learners can review materials, practice skills, and receive automated feedback anytime and anywhere, allowing for self-directed learning.

3. **Enhanced Interaction:** Face-to-face sessions complement online activities by providing opportunities for clarification, negotiation of meaning, and collaborative problem-solving, which are often difficult to replicate entirely online.
4. **Data-Driven Instruction:** Teachers can monitor student progress through learning management systems (LMS) and use analytics to adjust instruction, offer targeted support, and personalize learning pathways.

- **Example in Practice:**

A B1-level English class is learning job interview vocabulary and skills:

1. **Online Component:** Students complete interactive vocabulary exercises on Quizlet, watch short video interviews, and submit practice answers via an AI writing assistant.
2. **Face-to-Face Component:** Students participate in role-play mock interviews in pairs, receiving immediate feedback from the teacher and peers.
3. **Reflection:** Students write a self-evaluation of their performance using prompts provided in a digital platform, combining insights from online and in-class activities.

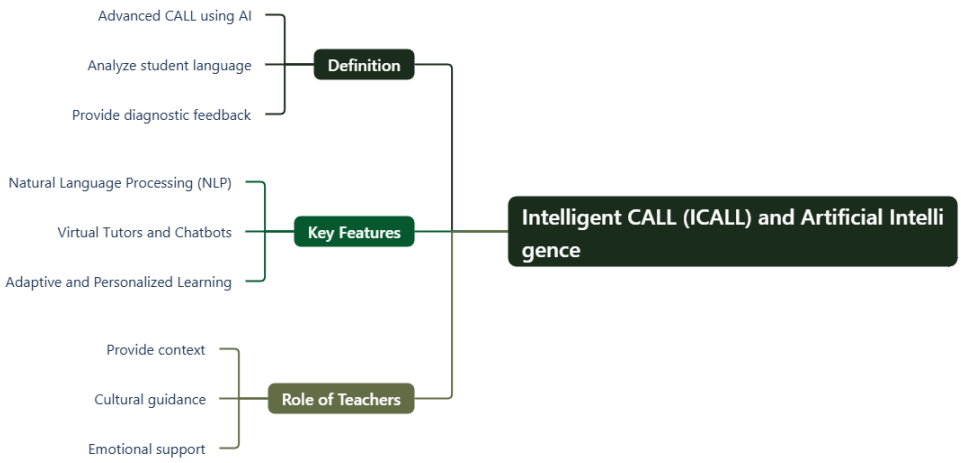
1.9.2 Benefits of Blended Learning:

- **Improved Learning Outcomes:** Research indicates that blended approaches typically yield better comprehension, retention, and skill development than exclusively online or traditional instruction (Chapelle & Sauro, 2017).
- **Learner Autonomy:** Students take more control over their learning by balancing online practice with guided classroom interaction.
- **Engagement and Motivation:** Multimedia tools, gamified exercises, and collaborative platforms enhance student interest and participation.
- **Personalization**: Teachers can differentiate instruction based on learner performance data collected through online systems.

Blended learning represents a synergistic approach, leveraging the strengths of both CALL and traditional pedagogy. By combining technology-mediated practice with human guidance, learners experience a more dynamic, engaging, and effective pathway to language acquisition.

1.10 Intelligent CALL (ICALL) and AI Integration

Figure 10. CALL and AI Integration



Source: Author's own elaboration.

The evolution of Computer-Assisted Language Learning (CALL) has culminated in Intelligent CALL (ICALL), which integrates Artificial Intelligence (AI) technologies to create more adaptive, interactive, and learner-centered experiences. Unlike traditional CALL, which often focuses on repetitive drills or pre-programmed exercises, ICALL leverages AI to analyze student input, detect patterns, and provide context-sensitive feedback.

Key Features of ICALL:

1. **Natural Language Processing (NLP):** AI systems can understand and process human language, allowing them to analyze written and spoken responses, identify grammatical or lexical errors, and generate meaningful corrections or suggestions.
2. **Adaptive Learning:** ICALL platforms adjust difficulty levels, content, and pacing based on learner performance, providing a personalized learning path for each student.
3. **Virtual Tutors and Intelligent Chatbots:** These AI-driven agents simulate human-like conversation, guiding learners through interactive dialogues, role-plays, or scenario-based exercises. They offer instant feedback, repetition opportunities, and scaffolded support to build confidence and fluency.
4. **Speech Recognition and Pronunciation Feedback:** Modern ICALL systems can evaluate pronunciation, prosody, and fluency, providing visual or auditory feedback to help learners improve articulation and oral communication skills.
5. **Data-Driven Insights:** AI collects and analyzes learning data, enabling teachers to monitor progress, identify challenges, and tailor instruction, while students gain insight into their strengths and weaknesses.

Example Applications:

- **Virtual Language Tutor:** A B1-level English learner interacts with an AI tutor that asks questions about daily routines. The system identifies recurring grammar mistakes, suggests corrected sentences, and adapts subsequent questions to target problematic areas.
- **AI Writing Assistant:** Students submit short essays, and the AI tool highlights grammatical errors, proposes stylistic improvements, and offers feedback on cohesion and clarity.

- **Pronunciation App:** Using speech recognition, the system scores pronunciation of words or phrases, visualizes stress patterns, and provides targeted practice exercises.

Benefits of AI-Enhanced CALL:

- Promotes **autonomous learning**, allowing learners to practice independently at their own pace.
- Provides **immediate, personalized feedback**, which is often difficult to achieve in large classrooms.
- Supports **realistic and meaningful communication** through simulated interactions and role-play scenarios.
- Enables **data-informed instruction**, enhancing teacher decision-making and individualized support.

Challenges and Considerations:

- **Algorithmic Bias:** AI systems may favor certain dialects or linguistic varieties, potentially disadvantaging some learners.
- **Data Privacy:** Speech and text data are often collected and stored, raising ethical concerns about security and consent.
- **Over-Reliance:** While AI provides valuable guidance, teacher oversight is essential to ensure feedback accuracy, contextual relevance, and holistic language development.

ICALL represents a paradigm shift in language education, moving from static, drill-based approaches to adaptive, interactive, and data-driven learning. By integrating AI, language learners benefit from personalized guidance, flexible practice, and immersive experiences, while educators gain tools for effective monitoring, assessment, and instructional design. This convergence of technology and pedagogy positions CALL as a powerful facilitator of autonomous, meaningful, and individualized language acquisition in the digital age.

1.11 Blended Learning (BL) in Language Education

Blended Learning (BL), also referred to as hybrid learning, is a pedagogical approach that integrates traditional face-to-face instruction with online or virtual learning experiences (Garrison & Vaughan, 2008; Graham, 2006). This model leverages the strengths of both modalities: the social interaction, immediate feedback, and guided practice found in classroom settings, along with the flexibility, interactivity, and self-paced opportunities offered by digital tools.

Blended learning has become one of the most widely adopted and effective methods in foreign language education, including English as a Foreign Language (EFL). By combining these elements, BL allows learners to practice language skills in authentic and varied contexts, access multimedia resources, participate in collaborative online activities, and receive individualized feedback. Furthermore, it encourages autonomous learning, motivates students through interactive and gamified content, and facilitates differentiated instruction tailored to diverse proficiency levels.

Overall, blended learning represents a dynamic and learner-centered approach, bridging the advantages of technology-enhanced learning with the personal engagement and pedagogical guidance of traditional classrooms.

Key Features of Blended Learning

1. **Integration of Components**

   Blended Learning merges in-class instruction with web-based activities, creating a cohesive learning experience where digital tools and traditional teaching complement each other (Graham, 2006).

2. **Technology and Face-to-Face Interaction**

   The model combines teacher-led classroom sessions with Computer-Assisted Language Learning (CALL) activities. This integration allows learners to reinforce skills, practice independently, and access additional resources outside of scheduled class time.

3. **Pedagogical Objective**

   The primary goal of Blended Learning is to provide students with a rich variety of materials and resources organized methodically to support language acquisition. It extends learning beyond the classroom by incorporating virtual tools such as wikis, blogs, podcasts, and educational websites, which complement and enhance traditional instruction. Through this approach, learners can engage with authentic materials, collaborate online, and exercise autonomy while still benefiting from structured classroom guidance.

1.11.1 Advantages

Blended Learning allows for flexibility, personalization, and interactive engagement. Students can progress at their own pace, revisit materials as needed, and participate in collaborative online activities, all while maintaining the social and communicative benefits of face-to-face instruction.
Consequently, BL is highly effective for developing all four language skills—listening, speaking, reading, and writing—within a coherent, learner-centered framework.

1.11.2 Characteristics and Purpose of Blended Learning

The Blended Learning (BL) model is designed to maximize learning potential and is generally more prevalent and effective than the exclusive use of technology-based instruction, or "pure CALL." In line with the philosophy of CALL, BL emphasizes the integration of face-to-face teaching with computer-assisted language learning, creating a cohesive and learner-centered instructional framework (Garrison & Vaughan, 2008; Graham, 2006).
Key Principles and Objectives
A central principle of BL is that in-class and online components should be connected and mutually supportive, with clear goals and learning objectives established from the outset of the course. The model seeks to balance the

strengths of both environments to optimize engagement, comprehension, and skill development. Its main objectives include:

1. Fostering Learner Autonomy
2. Blended Learning empowers students to work independently, monitor their own progress, and manage their pace of learning. By providing structured opportunities for self-directed study alongside guided classroom instruction, learners gain confidence and develop the skills necessary for autonomous language learning.
3. Individualized Learning Materials used in BL often incorporate interactive and personalized learning activities. These resources can adapt to the learner's proficiency, allowing them to focus on areas requiring reinforcement while progressing in areas of strength.
4. Extension of the Classroom

   When virtual resources are organized methodically by the instructor, students can explore topics more deeply, access supplementary materials, and engage with authentic language content beyond scheduled class hours. This extension of the learning environment promotes flexibility, enrichment, and engagement, enabling learners to consolidate and expand their language skills in meaningful ways.

Blended Learning combines the structured support of face-to-face teaching with the flexibility and interactivity of digital tools, fostering autonomy, individualized learning, and deeper engagement with content. By connecting classroom and virtual components in a purposeful manner, BL provides a comprehensive and adaptive framework for modern language instruction.

1.11.3 Key Components of the Blended Learning Model

When planning Blended Learning (BL) courses, it is essential to consider the model proposed by Khan (2005), which outlines eight fundamental dimensions that contribute to effective course design and implementation:

1. **Pedagogical Component**

   The pedagogical dimension is the most critical, requiring a methodologically sound plan to organize both face-to-face and online activities. Effective integration of these components ensures a coherent learning experience and promotes successful outcomes.

2. **Technological Component**

   This dimension addresses the need for a wide range of technological tools and platforms to engage students actively. Well-chosen technologies prevent boredom or frustration, supporting sustained motivation and interactive learning.

3. **Interface Design**

   Interface design refers to how instructors present materials both online and offline. This includes selecting appropriate layouts, navigation structures, and activities for each learning unit to ensure clarity, usability, and engagement.

4. **Institutional Aspect**

   Institutional support involves curriculum policies, material organization, and administrative and financial backing. Successful blended learning requires alignment with the institution's objectives, infrastructure, and support systems.

5. **Ethical Aspect**

   The ethical dimension ensures that all students are treated fairly and encourages learner autonomy. It also addresses challenges such as plagiarism, online identity issues, and equitable access to resources, promoting integrity and responsibility in digital learning environments.

6. **Resource Support**

   Ensuring students have access to relevant links, digital libraries, and

supplementary online resources is essential for extending learning beyond the classroom and facilitating independent study.

7. **Management**
   Effective BL requires a Learning Management System (LMS) that is fully operational and that students are trained to use efficiently. This component also emphasizes strategies for managing time, participation, and learning activities within virtual environments.
8. **Evaluation**
   Continuous assessment of both online and face-to-face components is necessary to improve the course, maintain coherence with the curriculum, and ensure that learning objectives are being met effectively.

1.11.4 Blended Learning in the Context of AI

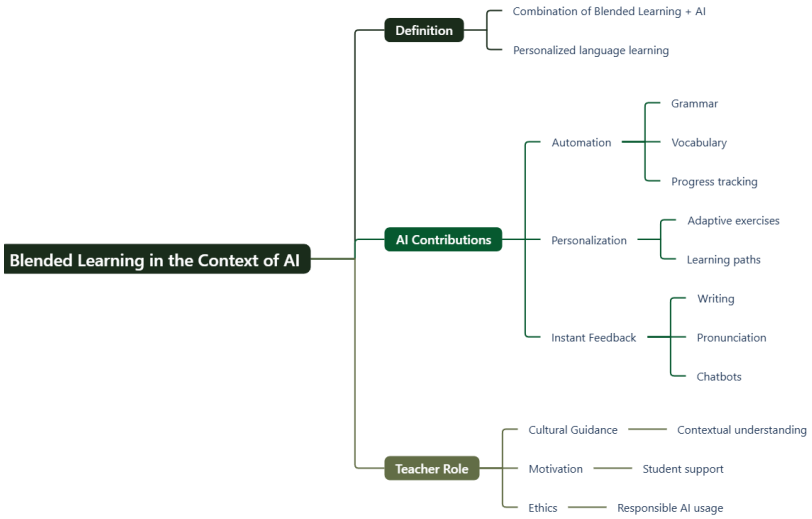
In modern language education, BL increasingly incorporates Artificial Intelligence (AI), resulting in a hybrid learning approach. In this context:

- AI systems automate repetitive tasks, provide personalized instruction, and offer adaptive feedback based on learner performance.
- Human instructors contribute contextual understanding, cultural sensitivity, and emotional support, ensuring learning remains meaningful, ethical, and effective.

This hybrid model exemplifies the synergy between technology and pedagogy, leveraging AI to enhance efficiency and customization while maintaining the irreplaceable human elements of teaching (Chapelle & Sauro, 2017; Khan, 2005).

1.12 Blended Learning in the Context of AI

Figure 11. Blended Learning in the Context of AI



Source: Author's own elaboration.

In contemporary language education, blended learning (BL) increasingly integrates Artificial Intelligence (AI) to create a hybrid, learner-centered environment. This approach combines the adaptive, data-driven capabilities of AI with the pedagogical guidance and social presence of human instructors, resulting in a more personalized and effective learning experience.

How AI Enhances BL:

1. **Automated Task Management:** AI handles repetitive activities such as vocabulary drills, grammar exercises, and progress tracking, freeing instructors to focus on higher-level teaching and interaction.
2. **Personalized Instruction:** Intelligent systems analyze learner data, identify strengths and weaknesses, and provide customized exercises, feedback, and learning pathways.
3. **Adaptive Feedback:** AI-powered tools, including writing assistants, pronunciation apps, and virtual chatbots, offer immediate, context-sensitive guidance, allowing students to practice at their own pace.

Role of Human Instructors:

- Provide cultural insights, contextual explanations, and nuanced feedback that AI cannot fully replicate.
- Support emotional and motivational aspects of learning, fostering a positive classroom environment and maintaining engagement.
- Ensure the ethical use of AI, addressing issues such as bias, data privacy, and responsible application.

Practical Example in EFL:

- **Online Component:** Students interact with an AI-powered chatbot to practice conversational English. The system corrects grammar, suggests alternative expressions, and adjusts difficulty according to learner performance.
- **Face-to-Face Component:** Instructors conduct role-play activities, discussion groups, and pronunciation workshops, reinforcing AI-supported practice with human-mediated interaction.
- **Reflection and Assessment:** Learners review AI-generated feedback and discuss it with the teacher, promoting metacognitive awareness and autonomous learning.

This AI-enhanced blended learning model demonstrates the synergistic potential of technology and pedagogy. AI increases efficiency, personalization, and accessibility, while teachers maintain the critical human elements of guidance, empathy, and ethical oversight, resulting in a rich, adaptive, and engaging language learning experience (Chapelle & Sauro, 2017; Khan, 2005).

1.13 Computer-Assisted Language Learning (CALL)

Computer-Assisted Language Learning (CALL), known in Spanish as Aprendizaje Asistido por Computadora para el Lenguaje, is defined by Levy (1997) as "the exploration and study of computer applications in the teaching and learning of languages." CALL encompasses both the theoretical study of

how computers can support language learning and the practical implementation of digital tools and resources in educational settings.

CALL includes a wide range of approaches and applications that leverage Information and Communication Technologies (ICT) to enhance the teaching and learning of foreign languages. These range from traditional drill-and-practice programs to interactive multimedia environments, online learning platforms, virtual worlds, and more recently, AI-driven language learning systems. As a field, CALL continues to evolve in response to technological innovations, pedagogical research, and the changing needs of learners in increasingly digital and globalized contexts.

By integrating both pedagogical principles and technological tools, CALL aims to provide interactive, learner-centered, and adaptive learning experiences, helping students develop linguistic skills more effectively than traditional classroom methods alone.

5.1 Related Terminology in CALL

Throughout its history, Computer-Assisted Language Learning (CALL) has been referred to by various alternative terms, often depending on the regional context or pedagogical focus:

- In British English, it is sometimes called CAL (Computer-Assisted Learning), reflecting a broader emphasis on technology-supported learning in general.
- In American English, it was initially known as CALI (Computer-Aided Language Instruction) or CAI (Computer-Aided Instruction). CALI was considered a subset of the broader CAI framework, focusing specifically on language instruction.
- The term CALI fell out of use among language teachers in the early 1980s, largely because it emphasized a teacher-centered approach, whereas educators increasingly preferred learner-centered

methodologies that emphasized active learning and student autonomy (Warschauer, 2000; Levy, 1997).

- Around the early 1990s, a new term emerged: TELL (Technology-Enhanced Language Learning). TELL highlighted the integration of multiple technological tools and digital resources to enhance language teaching, rather than relying solely on computer-based drills or tutorials.

The evolution of terminology reflects broader shifts in language teaching philosophy—from teacher-directed, drill-oriented instruction to interactive, learner-centered, and technology-mediated learning environments. Understanding these terms provides insight into the historical and pedagogical development of CALL as a discipline.

1.14 Scope, Technology, and Pedagogical Foundations of CALL

Computer-Assisted Language Learning (CALL) encompasses a wide range of applications and has evolved significantly from its early implementations to modern technology-enhanced learning environments.

Scope and Technology: The scope of Computer-Assisted Language Learning (CALL) has expanded far beyond its early focus on drill-and-practice programs. Contemporary CALL applications now leverage advanced Information and Communication Technologies (ICT) to create rich, interactive, and adaptive learning environments. These include multimedia platforms that integrate text, images, audio, and video to support all four language skills, online learning ecosystems that facilitate collaboration and access to authentic materials, and AI-driven tools that provide personalized feedback, automated assessment, and intelligent tutoring. By incorporating these technologies, modern CALL enables learner-centered approaches, promotes autonomous and self-paced learning, and allows educators to design instruction that is more contextualized, engaging, and responsive to individual learner needs.

Traditional Programs: Early CALL in the 1960s and 1970s was characterized by drill-and-practice software, designed to reinforce vocabulary, grammar, and pronunciation through repetitive exercises. These programs allowed learners to respond to computer-presented stimuli, but were limited in interactivity and communicative engagement (Warschauer, 2000).

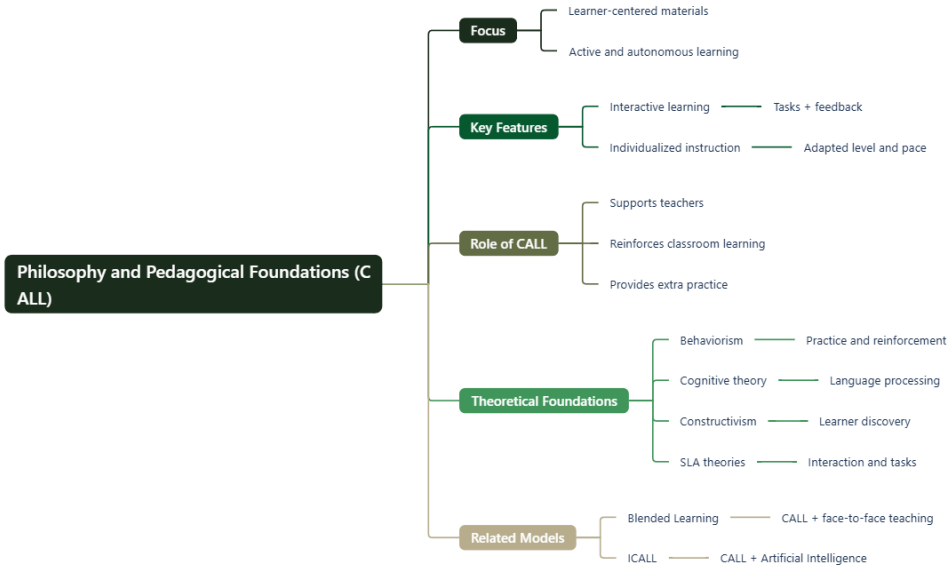
Modern Technologies: The scope of CALL now includes a variety of innovative tools and environments, such as:

- Virtual learning environments and web-based distance learning platforms
- Corpora and concordancers, supporting data-driven learning and exploration of authentic language patterns
- Interactive whiteboards, enhancing collaborative classroom activities
- Computer-Mediated Communication (CMC) for online discussion, chat, and videoconferencing
- Language learning in virtual worlds (e.g., MUDs, 3D simulations)
- Mobile-Assisted Language Learning (MALL), allowing students to practice anytime and anywhere

These modern technologies provide learners with flexible, interactive, and immersive experiences that go beyond the limitations of traditional classroom instruction.

1.15 Philosophy and Pedagogical Foundations

Figure 12. Philosophy and Pedagogical Foundations



Source: Author's own elaboration.

The contemporary philosophy of Computer-Assisted Language Learning (CALL) emphasizes the creation of learner-centered materials that empower students to take an active role in their language development. These materials may be structured, offering guided exercises and targeted practice, or open-ended, encouraging exploration, creativity, and autonomous problem-solving. Regardless of format, effective CALL resources typically incorporate two essential features: interactive learning, which engages learners through meaningful tasks and immediate feedback, and individualized instruction, which adapts content, difficulty, and pacing to meet the unique needs of each student.

CALL functions as a support tool for teachers, complementing classroom instruction by reinforcing lessons, providing additional practice opportunities, and enabling differentiated learning. The design and implementation of CALL materials are informed by established principles of language pedagogy and methodology, integrating insights from multiple learning theories such as behaviorism, constructivism, socio-cognitive theory, and communicative

language teaching. By combining these theoretical foundations with technological affordances, CALL fosters autonomy, motivation, and engagement, while allowing educators to tailor instruction to diverse learner profiles and evolving educational contexts.

The design of CALL materials integrates principles from language pedagogy and methodology, drawing on multiple learning theories, including:

- **Behaviorism**, emphasizing practice and reinforcement
- **Cognitive theory**, focusing on processing and internalization of linguistic input
- **Constructivism**, promoting learner-centered knowledge construction
- **Second language acquisition theories**, informing task-based learning and interactional approaches

By combining these theories with technological tools, CALL aims to create interactive, adaptive, and learner-centered environments that enhance both linguistic competence and learner autonomy.

Connections with Other Models

CALL is closely linked with other modern approaches in language education, particularly Blended Learning (BL) and Intelligent CALL (ICALL). These connections illustrate the evolution of language teaching from traditional computer-assisted drills to adaptive, learner-centered, and technology-enhanced environments.

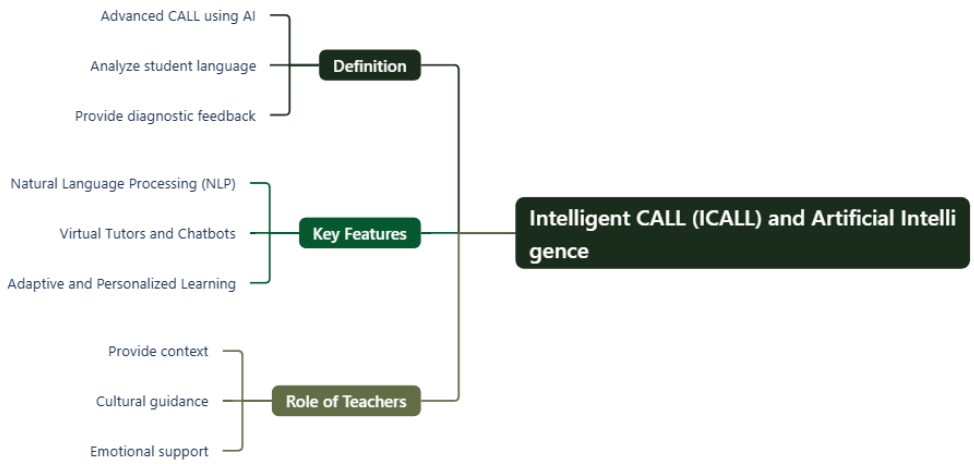
Blended Learning (BL)

The combination of face-to-face teaching and CALL activities is commonly referred to as Blended Learning (BL). This model integrates in-class instruction with web-based activities, offering students a wide range of learning materials and resources organized methodically to maximize learning potential. BL is generally more prevalent and effective than the exclusive use of CALL alone. BL can be defined in terms of its core characteristics:

- **Integration of Instruction:** BL unites classroom instruction with online activities, creating a cohesive learning experience.
- **Combination with CALL:** The integration of CALL into the blended model provides **interactive, technology-mediated learning opportunities**, complementing face-to-face instruction.
- **Pedagogical Objective:** BL is designed to **extend the learning environment beyond the classroom**, allowing students to access additional resources and engage in self-directed learning, while maintaining a structured, goal-oriented framework.

1.15.1 Intelligent CALL (ICALL) and Artificial Intelligence

Figure 13. Intelligent and Artificial Intelligence



Source: Author's own elaboration.

In its most advanced form, Intelligent CALL (ICALL) leverages Artificial Intelligence (AI) techniques, including Natural Language Processing (NLP), to

analyze student responses and provide diagnostic feedback. AI-driven systems, such as virtual tutors and intelligent chatbots, enable personalized and adaptive language learning, tailoring instruction to each learner's needs and progress (Warschauer, 2000; Levy, 1997).

ICALL exemplifies the shift from rigid, drill-based software toward dynamic, learner-centered environments, where technology assists in both assessment and individualized feedback, while human instructors continue to provide contextual understanding, cultural sensitivity, and emotional support.

Key Components of Effective Blended Learning

For BL to be effective, its components must operate in a cohesive and complementary manner:

1. **Connection and Complementarity:** In-class and online components should be interconnected rather than functioning as separate courses. Clear learning objectives and goals should be established at the beginning of the course.
2. **Technology and Activities:** BL involves the combination of various technologies, activities, and instructional events to create an optimal learning program. Virtual resources, including wikis, blogs, podcasts, and websites, supplement classroom instruction, enabling learners to explore topics in greater depth.
3. **Methodological Planning:** The design of a blended course must have a clear pedagogical foundation. Instructors should organize and integrate technological resources strategically, ensuring that students can engage meaningfully with the learning process and achieve the desired outcomes.

By combining pedagogically sound planning with interactive digital resources, BL and ICALL together provide a comprehensive framework for modern, adaptive, and learner-centered language education.

1.15.2 Aspects of the Model (Khan's Octagonal Framework)

When designing Blended Learning (BL) courses, educators often rely on Khan's (2005) Octagonal Framework, which provides a comprehensive guide to creating effective and engaging learning experiences. This model identifies eight critical dimensions that collectively ensure the quality, accessibility, and pedagogical soundness of a course. Each dimension addresses a specific aspect of course design, ranging from technical infrastructure to learner support, helping instructors systematically plan and implement BL programs that are both interactive and learner-centered. By considering all eight dimensions, course developers can anticipate challenges, enhance student engagement, and optimize learning outcomes in hybrid environments.

- **Pedagogical Component**

The most critical aspect, requiring a methodologically sound plan to organize face-to-face instruction alongside online learning activities. It ensures that all learning objectives are met systematically.

- **Technological Component**

Addresses the need for a diverse range of technological resources to engage learners actively, prevent boredom, and support interactive learning experiences.

- **Interface Design**

Refers to the ways in which instructors present online materials, including layout, navigation, and activity design to enhance usability and learner engagement.

- **Institutional Aspect**

Involves curriculum policies, administrative support, and financial resources. Institutional backing is essential for providing both infrastructure and guidance needed for successful blended courses.

- **Ethical Aspect**

Focuses on fair treatment of students and promoting learner autonomy. It addresses issues such as plagiarism, academic integrity, and equitable access to resources.

- **Resource Support**

Ensures that students have access to relevant links, digital libraries, and supplementary online resources, allowing them to extend learning beyond the classroom.

- **Management**

Involves preparing the Learning Management System (LMS) and training students in its effective use, alongside teaching strategies suitable for virtual learning environments.

- **Evaluation**

Emphasizes the continuous assessment of both online and in-person components to ensure alignment with course objectives and improve overall learning outcomes.

5.5 Benefits for Learning

Blended Learning fosters a dynamic and engaging learning environment. Research shows that students in BL courses become more active participants in their own learning, feel more technologically empowered, and can access learning anywhere and anytime. A well-designed blended course also:

- Promotes learner autonomy, allowing students to progress at their own pace.
- Enhances technological literacy, as students interact with various digital tools and platforms.
- Supports flexible and personalized learning experiences, enabling learners to explore topics in greater depth.

By integrating pedagogical planning, technology, and learner-centered design, BL provides a comprehensive framework that maximizes engagement, motivation, and learning outcomes (Khan, 2005; Graham, 2006).

Example: Benefits of Blended Learning (BL)

Context:

A B1 English class combines face-to-face lessons with online activities in a learning platform.

Example Activity:

Students practice speaking in class through role-plays, then complete online tasks at home such as watching videos, doing quizzes, and participating in discussion forums.

Observed Benefits:

- **Autonomy:** Students review materials and repeat exercises at their own pace.
- **Technological literacy:** Learners use platforms, videos, and digital tools confidently.
- **Flexibility:** They access content anytime, adapting learning to their schedule.
- **Personalization:** Extra resources are provided based on individual needs.

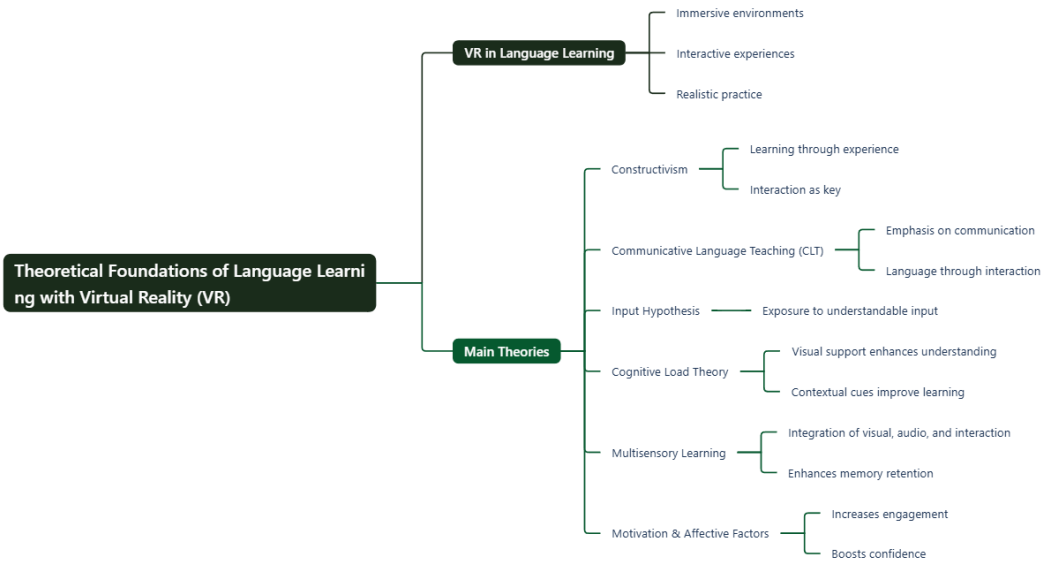
Result:

Students become more engaged, independent, and motivated, improving both language skills and digital competence.

CHAPTER 2

2. Theoretical Foundations of Language Learning with Virtual Reality (VR)

Figure 13. 2. Theoretical Foundations of Language Learning with Virtual Reality (VR)



Source: Author's own elaboration.

2.1 Introduction

The integration of Virtual Reality (VR) into language education is grounded in a strong theoretical foundation that draws on linguistics, cognitive psychology, and educational technology. VR provides learners with immersive, interactive, and context-rich experiences, allowing them to engage with language in realistic, meaningful situations. By situating students in virtual environments—such as marketplaces, airports, classrooms, or social settings—VR supports authentic communication and experiential learning, which can enhance both comprehension and production of the target language.

Examples of VR applications in language learning include platforms such as Mondly VR, ENGAGE, and AltspaceVR, which allow students to participate in simulated conversations, role-plays, and cultural explorations.

Typical VR-based activities include:

- **Virtual shopping or travel simulations**: Learners practice transactional language and vocabulary in authentic scenarios.
- **Role-play interactions**: Students take on different social roles, negotiating meaning, asking questions, and responding naturally.
- **Cultural immersion tours**: Learners explore virtual museums, cities, or events to develop both linguistic and intercultural competence.
- **Scenario-based problem solving**: Students collaborate in virtual tasks, such as organizing an event or navigating a city, using the target language.

By combining these activities with immediate feedback and interactive guidance, VR enhances motivation, engagement, fluency, and retention, making language learning both effective and enjoyable.

- **Constructivist Learning Theory**

Constructivist theory, as proposed by Piaget and Vygotsky, emphasizes that learners construct knowledge actively rather than passively receiving information. Learning occurs when students interact with their environment and integrate new experiences into existing cognitive structures. VR aligns perfectly with this philosophy because it provides immersive scenarios where learners can explore, experiment, and interact with virtual objects and characters.

For example, a student practicing English in a virtual restaurant simulation can engage in ordering food, asking questions, or negotiating a menu, thereby constructing language knowledge through authentic, context-based experience. This experiential approach promotes deeper understanding and retention, as students are not merely memorizing vocabulary or grammar rules—they are using them in a meaningful, practical context.

- **Communicative Language Teaching (CLT)**

Communicative Language Teaching (CLT) posits that interaction is the most effective pathway to language acquisition, emphasizing the development of

communicative competence through meaningful, authentic exchanges. VR environments align closely with this principle by creating immersive, interactive, and context-rich scenarios—such as virtual marketplaces, airports, restaurants, workplaces, or social gatherings—where learners must use the target language to complete tasks, negotiate meaning, and achieve communicative goals.

Within these virtual spaces, students can interact not only with AI-driven avatars but also with peers, engaging in role-plays that require them to practice pronunciation, vocabulary, pragmatics, and syntactic structures in context. Because these interactions occur in lifelike yet low-pressure environments, VR supports risk-taking, experimentation, and repeated practice, allowing learners to build confidence and fluency before applying their skills in real-world communication.

Unlike traditional classroom dialogues—often limited by time, physical space, and peer availability—VR enables unlimited repetition, exposure to diverse communicative partners, and opportunities for spontaneous language production. Moreover, integrated AI-based feedback systems can immediately highlight pronunciation issues, suggest alternative expressions, or provide corrective input, reducing the likelihood of fossilized errors and enhancing overall accuracy. This combination of authentic interaction, safe practice spaces, and instant feedback makes VR a powerful tool for implementing CLT principles in modern language learning environments.

- **Input Hypothesis (Krashen, 1985)**

Krashen's Input Hypothesis emphasizes that comprehensible input—language slightly above the learner's current level—is critical for acquisition. VR is uniquely suited to this approach because it allows dynamic adjustment of difficulty based on learner proficiency.

For instance, a VR program might present simplified interactions for beginners and complex, idiomatic conversations for advanced learners. Moreover, VR leverages visual and contextual cues—such as gestures, environmental sounds,

and on-screen prompts—to make input understandable and meaningful. By situating language in a context that mirrors real-world communication, VR helps learners internalize vocabulary, sentence structures, and pragmatic usage more effectively than decontextualized exercises.

- **Cognitive Load Theory**

According to Cognitive Load Theory (Sweller, 1988), learning is impeded when the cognitive demands of a task exceed the learner's working-memory capacity. VR can help mitigate this challenge by reducing extraneous cognitive load and supporting more efficient processing. Because VR environments offer multimodal cues—visual, auditory, and kinesthetic—learners are able to distribute information across multiple sensory channels rather than relying solely on text or teacher explanations.

For instance, when learning new vocabulary, a student can see the object within the virtual environment, hear its pronunciation, and interact with it physically through virtual manipulation. This multisensory integration strengthens mental representations, making vocabulary more memorable and meaningful. By grounding language in context-rich action, VR reduces abstract processing demands and facilitates schema construction, a core goal of cognitive load optimization.

Unlike traditional rote memorization or decontextualized drills, VR scaffolds learning through situated tasks—such as completing missions, solving problems, or navigating virtual spaces—where language is used purposefully to achieve outcomes. This approach enhances retention, reduces mental fatigue, and supports long-term, transferable understanding. In this way, VR aligns with cognitive load principles by creating environments that are cognitively manageable, pedagogically supportive, and deeply engaging.

- **Multisensory Learning Theory**

Research in multisensory learning demonstrates that activating multiple sensory channels—visual, auditory, and kinesthetic—enhances memory, comprehension, and overall skill acquisition. Virtual Reality (VR) naturally aligns with this theory by immersing learners in environments where sensory input is integrated and contextually meaningful, rather than fragmented or artificially constructed. This makes VR particularly effective for language learning, where meaning is shaped not only by linguistic forms but also by environmental cues, gestures, prosody, and cultural context.

Consider a virtual market simulation, where students are surrounded by authentic language and situated tasks. In this environment, learners can:

- See goods, menus, price tags, and environmental signs in English.
- Hear background conversations, ambient sounds, and the speech of virtual shopkeepers or peers.
- Interact physically by picking up items, pointing, gesturing, or role-playing purchasing and negotiation sequences.

This rich sensory engagement contributes to deeper processing and more durable learning, allowing students to form strong mental associations between words, actions, and contexts. Beyond vocabulary acquisition, multisensory VR experiences support the development of pragmatic competence, helping learners refine skills such as:

- Turn-taking and conversational flow
- Appropriate intonation and stress patterns
- Culturally appropriate gestures and politeness strategies
- Interpreting visual and contextual cues during interactions

VR therefore delivers a holistic learning experience that surpasses traditional classrooms, which often rely heavily on text, isolated audio clips, or static multimedia. By immersing learners in interactive, multisensory environments,

VR fosters meaningful communication, enhances cultural understanding, and supports more effective long-term language acquisition.

- **Motivation and Affective Factors**

In addition to cognitive and linguistic perspectives, the effectiveness of VR in language education is strongly supported by research on affective factors—including motivation, confidence, and anxiety reduction—which are well-established predictors of successful language acquisition. VR environments provide safe, low-stress spaces where learners can practice the target language without fear of negative evaluation, a factor often linked to reduced performance in traditional classroom settings. Because VR interactions occur privately or among avatars rather than face-to-face, learners experience lower affective filters (Krashen, 1982), enabling more fluent, spontaneous language use.

The immersive and gamified nature of VR can also significantly enhance intrinsic motivation. Learners become active participants in engaging, goal-oriented activities rather than passive recipients of information. VR scenarios often involve role-playing missions, exploratory tasks, or quest-based challenges that require meaningful language use. For example, students might complete a quest-based communication task, such as asking for directions to locate a hidden object or negotiating with virtual characters to complete a mission. As they progress, learners can receive immediate rewards, visual feedback, or achievement badges, which reinforce both communicative success and overall engagement.

By promoting confidence, curiosity, and willingness to communicate, VR supports key affective dimensions of language learning that traditional classroom environments may struggle to activate. This combination of emotional safety, motivational design, and immersive interaction positions VR as a powerful tool for supporting learner affect and sustaining long-term interest in language study.

2.2 Integration of Theories for Optimal VR Learning

Virtual Reality (VR) stands out as a transformative tool in language education because it synthesizes insights from multiple theoretical frameworks, creating a holistic and pedagogically robust learning environment. By integrating constructivist principles, communicative language teaching (CLT), comprehensible input theory, cognitive load management, and multisensory learning, VR supports language acquisition from several complementary angles.

This theoretical integration ensures that learners can:

- Actively construct knowledge in meaningful contexts, aligning with constructivist views of learning as an experiential, problem-solving process.
- Engage in authentic, interactive communication, consistent with CLT's emphasis on meaningful exchanges and real-world language use.
- Receive scaffolded, comprehensible input, as VR environments naturally contextualize language, gestures, visuals, and actions to support understanding.
- Manage cognitive load more effectively, as multisensory cues distribute information across visual, auditory, and kinesthetic channels, reducing working-memory strain.
- Experience heightened engagement, motivation, and confidence, supported by immersive tasks, low-stress environments, and game-like quest structures.

In combination, these factors make VR a high-impact tool for modern language education, offering learning experiences that are richer, more interactive, and more cognitively efficient than traditional classroom methods. VR's capacity to combine immersion, interaction, and adaptive support enables learners to achieve greater proficiency, improved fluency, enhanced retention, and increased communicative confidence, positioning it as a key innovation in 21st-century language pedagogy.

2.2.1 Example 1: VR Role-Play Activity for an ESL Class

Lesson Title: "Ordering Food in a Virtual Restaurant"

Level: A2–B1 (Elementary to Intermediate)

Lesson Duration: 45–60 minutes

Activity Description

Students enter a VR restaurant simulation where they interact with AI-driven waiters and other virtual customers. Their task is to read the menu, place an order, ask follow-up questions, respond to unexpected situations, and complete the meal transaction.

- **How the VR Lesson Reflects Key Learning Theories**

Constructivist Learning

Students learn by *doing*:

- Exploring the restaurant
- Selecting a table
- Interacting with objects (menus, utensils, plates)
- Negotiating meaning with the AI waiter

Learners *construct* knowledge from their own decisions and experiences rather than memorizing dialogues.

Communicative Language Teaching (CLT)

The primary goal of this VR scenario is meaningful communication. Students use English to:

- Ask for information ("What do you recommend today?")
- Express preferences ("I'd like something vegetarian.")
- Clarify misunderstandings ("Sorry, can you repeat that?")
- Respond spontaneously to the waiter

This mirrors **authentic real-life communication**, not scripted drills.

Comprehensible Input (Krashen)

VR supports understanding through:

- Visual prompts (menus, pictures, gestures)
- Clear audio input from the waiter
- Context clues (sounds of cooking, kitchen, conversations)
- Environmental scaffolding

The language is slightly above the learners' current level (i + 1), but the rich visual context keeps it comprehensible.

Cognitive Load Theory

VR reduces unnecessary cognitive load by distributing information across multiple channels:

- **Visual:** menu items, prices, restaurant layout
- **Auditory:** waiter's voice, environmental cues
- **Kinesthetic:** selecting items, gesturing, pointing

This makes vocabulary and structures easier to remember (e.g., "Could I have…?", "I'll take…").

Multisensory Learning Theory

Students engage in physical, auditory, and visual learning:

- They *see* items
- They *hear* language
- They *interact* with objects and characters

This creates deeper memory pathways and improves retention of phrases and pronunciation.

Motivation and Affective Factors

VR lowers anxiety and increases motivation:

- Students practice speaking without fear of judgment
- The scenario feels like a game or adventure
- AI waiters are patient and non-evaluative

- Learners can repeat the task as many times as they want

This builds **confidence and willingness to communicate**, essential for ESL success.

Learning Outcomes

By the end of the activity, students can:

- ✓ Order food and drinks in English
- ✓ Ask for recommendations and clarify details
- ✓ Use polite request forms ("Could I…?", "Would you mind…?")
- ✓ Handle unexpected language situations
- ✓ Improve pronunciation through repeated practice

Example 2. Task Flow

1. Pre-VR (10 minutes)

- Teach key vocabulary: menu items, polite requests
- Model simple dialogues

2. VR Experience (20–25 minutes)

Students enter the VR restaurant and complete a mission:

Task: Order a full meal (drink, appetizer, main course, dessert).

Challenge: Respond to an unexpected change (e.g., "We are out of soup today.")

3. Post-VR (10–15 minutes)

- Students discuss their experience
- Compare menus and choices
- Reflect on communicative strategies

Why This Example Works for ESL Classes

It integrates:

- Meaningful communication
- Real-world scenarios

- Multisensory input
- Scaffolded learning
- Reduced anxiety
- High engagement
- Theory-based instructional design

Example 3: VR Role-Play Activity for an ESL Class

Lesson: *"Asking for Directions in a Virtual City"*

Level: A2–B1

Duration: 45–60 minutes

Activity

Students enter a **VR city simulation** and ask virtual characters for directions to reach a location (museum, café, station).

Learning Theories in Practice

Constructivist Learning

- Students explore the city
- Interact with maps, streets, and characters
- Learn through experience

Communicative Language Teaching (CLT)

Students practice real communication:

- "Excuse me, how do I get to the museum?"
- "Turn left at the corner."

Comprehensible Input

- Visual cues (signs, buildings)
- Clear audio instructions
- Context helps understanding

Cognitive Load Theory

- Visual map
- Spoken directions
- Interactive movement

Multisensory Learning

- See places
- Hear instructions
- Move and interact

Motivation

- Game-like exploration
- Low anxiety practice
- Repeat tasks for improvement

Learning Outcomes

- ✓ Students can:
- ✓ Ask for and give directions
- ✓ Use polite questions
- ✓ Understand location vocabulary
- ✓ Practice pronunciation and fluency

Task Flow

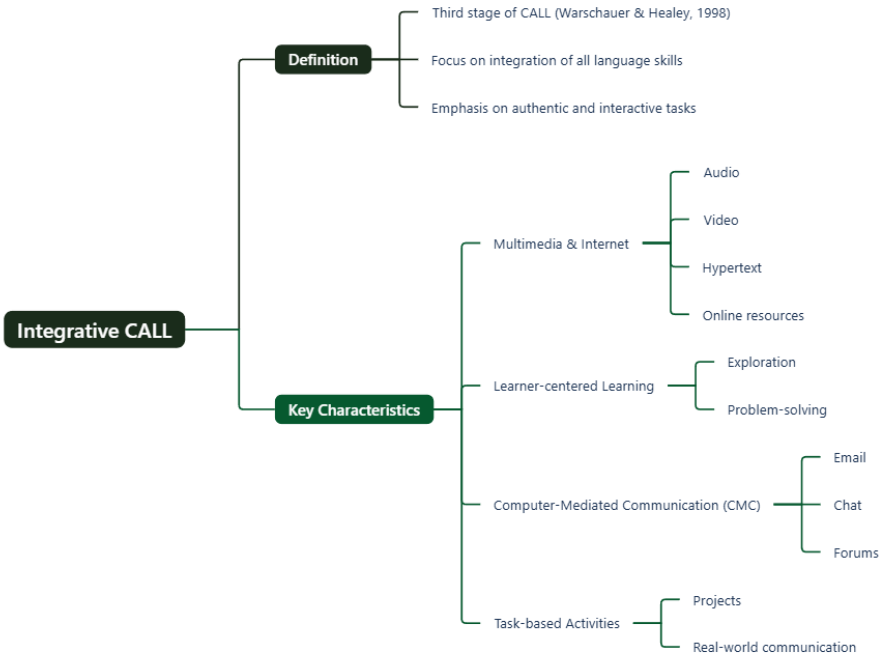
Pre-VR: learn vocabulary (left, right, straight)

VR Activity: find a location in the city

Post-VR: discuss routes and strategies

2.3 Integrative CALL

Figure 13. Integrative ALL



Source: Author's own elaboration.

The Integrative CALL phase represents the third major stage in the historical development of Computer-Assisted Language Learning (CALL), as identified by Warschauer and Healey (1998). According to Warschauer (2000), this stage continued into the early 2000s and marked a transformative shift in the pedagogical use of technology for language education. Unlike the earlier Behaviorist and Communicative phases—characterized by discrete-point drills or limited communicative tasks—Integrative CALL focuses on a holistic, socio-cognitive approach in which multiple language skills (listening, speaking, reading, and writing) are developed simultaneously through rich, interactive, and authentic tasks.

Key Characteristics of Integrative CALL

- **Integration of Multimedia and Internet Technologies**

Integrative CALL emerged alongside rapid advancements in multimedia computing and widespread access to the internet. These technologies allowed educators to combine audio, video, hypertext, animations, and interactive tasks in a single learning environment. Learners could explore content nonlinearly, access authentic materials, and engage in tasks that mirrored real-world communication.

- **Learner-Centered, Constructivist Learning**

Instead of presenting language in isolated units, Integrative CALL fosters environments where students construct knowledge through inquiry, exploration, and problem-solving. The computer acts not as a tutor but as a platform for communication, collaboration, and discovery. Learners take greater responsibility for their progress through project-based tasks, self-paced learning, and online research.

- **Use of Computer-Mediated Communication (CMC)**

Synchronous tools (e.g., chat rooms, video conferencing) and asynchronous tools (e.g., email, forums, blogs) became central to Integrative CALL. These communication channels enable authentic language use by connecting learners with real audiences, partners, or communities around the world.

- **Focus on Authentic, Task-Based Activities**

Integrative CALL aligns closely with task-based and content-based instruction. Students might complete projects, gather information online, collaborate with peers, and engage in simulations that require meaningful language use. Tasks are often interdisciplinary and extend beyond the classroom.

Example1: Integrative CALL Activity in an ESL Classroom

Project Title: "Global News WebQuest"

Objective:

To develop reading, writing, speaking, and digital literacy skills through authentic online research and collaborative presentation tasks.

Tools Used:

- Online newspapers and media websites
- Classroom learning platform (Google Classroom / Moodle)
- Synchronous chat or video conferencing tools
- Presentation software (Google Slides, Canva)

Task Description

Students work in pairs or small groups to investigate a current global news event using authentic online sources. They must:

1. **Research:**
   Explore international news websites, compare perspectives, and gather key information on the chosen topic.
2. **Analyze:**
   Identify differences in reporting styles, vocabulary, cultural perspectives, and tone across sources.
3. **Collaborate:**
   Use discussion forums, messaging apps, or video conferencing tools to share findings, plan their presentation, and clarify misunderstandings.
4. **Produce:**
   Create a multimedia presentation that includes:
   - Written summaries
   - Screenshots or links to authentic texts
   - Vocabulary analysis
   - A short recorded oral commentary (audio or video)
5. **Present:**
   Deliver the final product to the class using digital tools, followed by a Q&A session supported by collaborative chat tools.

- **Why This Activity Represents Integrative CALL**

Multimedia Integration – Students combine text, images, audio, and video to create a holistic project.
Authentic Input – Learners engage with real news articles, not simplified textbook passages.
CMC Interaction – Students collaborate online and communicate through digital platforms.
Learner-Centered – They choose topics, decide how to present information, and manage their own research process.
Interdisciplinary Skills – The task develops critical thinking, digital literacy, and teamwork, not just language proficiency.
Task-Based Learning – The project has a real purpose and mirrors authentic academic and workplace communication.

- **Resulting Learning Benefits**

  Development of integrated language skills
  Enhanced learner autonomy and digital competence
  Increased motivation through meaningful, real-world tasks
  Exposure to diverse linguistic and cultural perspectives
  Opportunities for interaction, negotiation of meaning, and collaborative problem-solving

EXAMPLE 2. Example: Integrative CALL Activity
Project: *"Global News WebQuest"*
Objective: Develop **reading, writing, speaking, and digital literacy** through online research.
Task: Students work in groups to **research a global news topic** using online sources.

Steps

1. **Research:** explore international news websites
2. **Analyze:** compare vocabulary, tone, and perspectives
3. **Collaborate:** discuss ideas using online tools
4. **Create:** make a multimedia presentation
5. **Present:** share results and answer questions

Tools

- Online news websites
- **Google Classroom** / **Moodle**
- **Google Slides** / **Canva**

Why It Represents Integrative CALL

- **Multimedia integration**
- **Authentic materials**
- **Online collaboration (CMC)**
- **Learner-centered, task-based learning**

Result:

Integrated language skills, autonomy, and real-world communication practice.

2.4 Pedagogical Approach and Objectives

The main purpose of Integrative CALL was to overcome the limitations of the preceding Communicative CALL phase, in which language activities—although more interactive than behaviorist drills—were often fragmented, skill-specific, and lacking in overall pedagogical cohesion. Communicative CALL tended to isolate skills (e.g., reading tasks in one program, writing tasks in another), making it difficult for learners to perceive how different aspects of language competence interconnected in real communicative situations.

Integrative CALL addressed this issue by shifting toward a unified, holistic approach in which listening, speaking, reading, and writing are developed together through meaningful, contextualized tasks. Rather than practicing each skill in isolation, learners engage in project-based and task-based activities that mirror authentic communicative demands. These tasks—such as WebQuests, online discussions, multimedia presentations, virtual exchanges, or collaborative research projects—require students to draw on multiple linguistic skills simultaneously and purposefully.

By embedding skills within coherent instructional sequences, Integrative CALL provides learners with a stronger sense of direction, continuity, and purpose in their language development. The integration of multimedia, the Internet, and communication tools enables learners to move fluidly between receptive and productive modes, reinforcing connections between comprehension and expression. As a result, language learning becomes more context-rich, experiential, and cognitively engaging, supporting deeper processing and more durable acquisition.

Key pedagogical shifts include:

From drill-based to project-based learning: Instead of repetitive exercises, learners engage in tasks that require authentic language use. For example, creating a multimedia presentation in the target language combines research, writing, and speaking skills.

From teacher-centered to learner-centered instruction: Students take a more active role in managing their learning, using technology as a tool for exploration and creation rather than passive practice.

Extension beyond the classroom: The computer transitions from a rigid tutorial system to a platform for ongoing, authentic language engagement, connecting learners with real-world resources, peer communication, and global networks.

This phase reflects a broader trend in applied linguistics: technology is no longer just a support tool; it is an integral component of the learning ecosystem, facilitating learner autonomy, interaction, and skill integration.

2.5 Key Technological Developments

The Integrative CALL phase coincided with two major technological innovations that transformed language learning:

Multimedia Technology:

Multimedia allowed the combination of text, graphics, audio, and animation in a single platform, enabling learners to engage all four language skills in interconnected ways. Early examples of multimedia CALL programs include:

- Laser Disc-based applications like Montevideo and À la rencontre de Philippe, which offered interactive scenarios integrating listening comprehension and reading.
- CD-ROM-based educational games, such as Who is Oscar Lake? which introduced problem-solving and role-playing elements to enhance communicative competence.

These innovations allowed learners to experience contextualized language input, engage in tasks that mirror real-life communication, and interact with multiple modalities simultaneously, reinforcing cognitive and linguistic processing.

Computer-Mediated Communication (CMC):

During the Integrative CALL phase, Computer-Mediated Communication (CMC) became one of the most transformative innovations in language education. CMC technologies—including email, chat rooms, bulletin boards, online forums, and early synchronous messaging tools—enabled learners to communicate with peers, teachers, and international partners in the target language. This development represented a major departure from the one-way, stimulus–response activities characteristic of Behaviorist CALL and the skill-fragmented practices of Communicative CALL.

Instead of treating computers as tools for isolated drills or discrete grammar practice, CMC introduced opportunities for authentic, meaningful interaction, aligning with principles of Communicative Language Teaching (CLT). Through CMC, learners engaged in real exchanges of information, negotiated meaning, asked questions, clarified misunderstandings, and co-constructed knowledge—all essential processes for developing communicative competence. These platforms allowed for both synchronous communication (e.g., live chats) and asynchronous interaction (e.g., email or discussion boards), supporting diverse learning styles and schedules.

A defining strength of CMC was its ability to extend communication beyond the physical classroom. Students could participate in telecollaborative projects, language exchanges, and international pen-pal programs, offering exposure to global audiences and authentic linguistic input. This marked a significant pedagogical shift: the computer was no longer viewed as an authoritative tutor, delivering predetermined exercises, but rather as an enabling medium that facilitated collaboration, exploration, and real-world engagement.

By positioning the computer as a communication platform, Integrative CALL fostered a more holistic, interactive, and socially situated approach to language learning, laying the foundation for later developments such as online learning communities, virtual exchanges, and today's AI-enhanced communication tools.

- **ESL Classroom Example 1: Using CMC for Collaborative Writing and Communication**

Context:

An intermediate-level ESL class (B1 CEFR) with 20 students, aiming to improve writing, reading, and interaction skills. The lesson objective is to develop collaborative writing, peer feedback, and authentic communication using technology.

Activity: International Pen-Pal Project via Email and Discussion Boards

1. **Setup:**
    - Students are paired with peers from another country through a secure online discussion platform (e.g., Edmodo, Google Classroom, or a moderated forum).
    - Each pair creates an introductory post describing themselves, their hobbies, and daily routines.
2. **Task:**
    - Over two weeks, students exchange messages, responding to prompts such as:
    - "Describe your favorite holiday and explain why it is important in your culture."
    - "Share a recipe or a local tradition and ask questions to learn about your partner's culture."
    - Students are encouraged to ask follow-up questions, correct minor errors politely, and reply in full sentences.
3. **Integration of Skills:**

    Writing: Compose coherent, culturally aware messages.

    Reading: Understand peers' messages and extract information.

    Speaking (Optional): Students record short audio responses using tools like Vocaroo or Flipgrid.

    Cultural Competence: Learn about real-life contexts and practices in another culture.

4. **Teacher Role:**

   Monitors exchanges, provides feedback on language use, and intervenes if misunderstandings arise.

   Highlights common errors and patterns for class-wide discussion.

   Encourages reflection on communication strategies, fostering metacognitive skills.

5. **Benefits:**
   - Encourages authentic, meaningful communication.
   - Integrates multiple skills in context.
   - Promotes learner autonomy and collaboration.
   - Uses computers as an enabling medium rather than just a drill tool.

- **ESL Classroom Example 2: Integrative CALL Activity in an ESL Classroom**

Project Title: *"Cultural Traditions Exchange"*

Objective: Develop reading, writing, speaking, and intercultural communication through online collaboration.

Tools Used:

- Online discussion platforms
- Video conferencing tools
- Presentation software

Task Description

Students work in small groups to explore cultural traditions from different countries**.**

1. **Research:**

   Students search online for information about a cultural celebration or tradition.

2. **Analyze:**

   They compare traditions, vocabulary, and cultural meanings.

3. **Collaborate:**

   Groups discuss their findings using online chats or forums.

4. **Produce:**

   Students create a multimedia presentation including:

- Short written explanations
- Images or videos
- Key vocabulary
- A recorded oral explanation

5. **Present:**

   Groups present their project to the class and answer questions.

Learning Benefits

- Integration of multiple language skills.
- Development of digital literacy.
- Authentic communication and collaboration.
- Increased motivation and cultural awareness.

Debate on "Integration"

While Warschauer and Healey (1998) identified Integrative CALL as a definable phase, some scholars have questioned its extent of realization. Bax (2003) argued that true integration had not yet been fully achieved. He proposed that Integrative CALL should only be considered fully realized when technology use reaches a state of "normalization", meaning that the use of CALL tools becomes as routine and unremarkable as using a pen or notebook.

According to Bax, normalization implies:

Seamless integration of technology into everyday learning activities, rather than occasional or supplementary use.

Institutional and pedagogical acceptance, where CALL tools are embedded into curricula as essential components rather than experimental additions.

Learners and teachers viewing technology as a natural part of learning rather than an extra or specialized resource.

This debate highlights that while Integrative CALL represented a significant theoretical and practical shift, the full potential of integration depends on institutional support, teacher training, and widespread adoption.

Integrative CALL marked a transformative stage in the history of CALL by combining pedagogical coherence, multimedia resources, and computer-mediated communication to provide a more authentic and immersive learning experience. The phase reflects a broader understanding of language learning as interactive, multimodal, and learner-centered, emphasizing the integration of the four core language skills in meaningful contexts. While theoretical and practical debates continue, particularly regarding the normalization of technology use (Bax, 2003), Integrative CALL laid the foundation for subsequent developments, including Intelligent CALL (ICALL), blended learning, and VR-based language education.

2.6 Technological Pedagogical Content Knowledge (TPACK)

The Technological Pedagogical Content Knowledge (TPACK) framework is an influential educational model that describes the essential intersections between technology, pedagogy, and content knowledge for effective teaching and learning. Developed by Mishra and Koehler (2006), TPACK provides a comprehensive lens through which educators can evaluate and design technology-integrated instruction, ensuring that technology enhances rather than dominates the learning process.

The framework emphasizes that effective teaching in contemporary classrooms requires not only expertise in content and pedagogy but also the ability to integrate technology in ways that are pedagogically sound and contextually appropriate.

2.6.1 Core Domains (Knowledge Anchors)

The TPACK model identifies three primary knowledge domains, which serve as the foundational pillars for teacher expertise:

1. Content Knowledge (CK):

   This domain refers to a teacher's understanding of the subject matter itself. It includes knowledge of concepts, theories, principles, facts, frameworks, and practices relevant to the discipline. CK is crucial for determining what should be taught and for identifying critical ideas that students need to understand.

2. Pedagogical Knowledge (PK):

   PK encompasses a teacher's understanding of how to teach, including strategies, methods, and approaches suitable for facilitating learning. This includes knowledge of lesson planning, classroom management, instructional scaffolding, and how to adapt teaching to students' varying needs, interests, and abilities. PK ensures that content is accessible, engaging, and meaningful.

3. Technological Knowledge (TK):

   TK involves teachers' knowledge and proficiency with digital tools, platforms, and emerging technologies. This includes understanding how to use technology for instructional purposes, integrate it into lesson design, and leverage it to enhance learning outcomes, rather than using it simply for novelty. Examples include learning management systems, interactive whiteboards, educational apps, and multimedia resources.

2.7 Specific Forms of Knowledge (Intersections)

The intersections of these primary domains give rise to three additional forms of specialized knowledge:

1. Pedagogical Content Knowledge (PCK):

   PCK is the intersection of pedagogy and content. It represents the teacher's ability to present content in ways that are understandable, engaging, and pedagogically sound. For example, knowing how to

teach complex grammar structures to EFL learners using scaffolding techniques illustrates PCK in action.

2. Technological Content Knowledge (TCK):

   TCK lies at the intersection of technology and content. It involves understanding how technology can support, represent, or enhance the understanding of specific content. For instance, using interactive simulations to teach chemical reactions or using digital concordancers to explore vocabulary patterns in a language course.

3. Technological Pedagogical Knowledge (TPK):

TPK integrates technology and pedagogy, focusing on how tools and resources can support teaching strategies and learning processes. It includes knowledge about using digital platforms for formative assessment, collaborative learning, or differentiated instruction. TPK is crucial for adapting teaching methods to the affordances and limitations of technology.

- **ESL Classroom Example 1: Teaching Conditional Sentences with Technology**

Level: B1/B2 (Intermediate)

Objective: Students will understand and correctly use first and second conditional sentences in speaking and writing.

1. Pedagogical Content Knowledge (PCK)

- **Application:** The teacher knows that conditionals are challenging because students often confuse tenses.
- **Example Strategy:**
  - Introduce the structure with guided discovery: Present sentences like *"If it rains, I will stay home"* and *"If I won the lottery, I would travel the world"*.
  - Use scaffolding techniques: Highlight the patterns step by step, provide sentence starters, and model correct usage.

- **Outcome:** Students understand not just the grammar rules, but also how to use them in meaningful contexts (e.g., making predictions or imagining hypothetical situations).

2. Technological Content Knowledge (TCK)

- **Application:** The teacher leverages digital tools to illustrate conditional usage.
- **Example Tools:**
    - **Concordancers** (e.g., AntConc) to explore real-life examples of conditional sentences in English corpora.
    - **Interactive grammar apps** (e.g., Grammarly, Quillbot) to show automated suggestions and patterns in student writing.
- **Outcome:** Students see authentic examples of conditionals in context, helping them connect grammar rules to real language usage.

ESL Classroom Example 2**: eaching Past Tense Narratives with Technology**

Level: B1–B2 (Intermediate)

Objective: Students will learn to **use the past simple and past continuous tenses** to describe past events and tell short stories in speaking and writing.

1. Pedagogical Content Knowledge (PCK)

Application:

The teacher understands that students often struggle to distinguish when to use past simple and past continuous**,** especially when describing events and background actions in a story.

Teaching Strategy:

- The teacher introduces example sentences such as:

    I was walking in the park when it started to rain.

    She was studying while her brother watched TV.

- Students analyze the sentences and identify the difference between a long action (past continuous) and a short action (past simple)**.**
- The teacher provides guided practice, asking students to complete sentences like:

  I was studying when…

  While we were traveling, we…
- Students then work in pairs to create short personal stories about a memorable day**,** using both verb forms.

Outcome:

Students understand how and when to combine past simple and past continuous to describe events and actions in narratives.

2. Technological Content Knowledge (TCK)

Application:

The teacher integrates digital tools to help students practice storytelling, receive feedback, and create multimedia narratives**.**

Example Tools:

- **Padlet** – Students post short written stories and comment on classmates' posts.
- **Flip** – Students record a short video telling a personal story using past tenses.
- **Canva** – Students create a visual timeline or story presentation to illustrate their narrative.

Outcome:

Technology helps students visualize events, practice storytelling, and receive peer and teacher feedback**,** reinforcing their understanding of past tense usage.

Learning Benefits

- Improved ability to describe past events clearly.
- Development of storytelling and narrative skills.

- Integration of speaking, writing, and digital literacy.
- Increased student engagement through multimedia activities.
- Opportunities for collaboration and peer feedback.

3. Technological Pedagogical Knowledge (TPK)

- **Application:** The teacher integrates technology into pedagogical strategies to enhance learning.
- **Example Implementation:**
    - Use **Padlet or Jamboard** for collaborative sentence creation: students post conditional sentences, respond to peers, and correct mistakes.
    - Conduct a **Quizizz activity** to provide immediate feedback on sentence formation.
    - Use **AI chatbots** (like ChatGPT) to simulate conversations where conditionals are needed ("What would you do if…?").
- **Outcome:** Students practice conditionals interactively, receive immediate feedback, and collaborate digitally, making learning more engaging and personalized.

Integration of Knowledge Intersections:

- **PCK:** Pedagogical strategy ensures comprehension of grammar.
- **TCK:** Technology provides authentic examples and resources.
- **TPK:** Tools enhance pedagogy, enabling interaction, feedback, and engagement.

This ESL lesson demonstrates how the three knowledge intersections combine to create an effective, tech-enhanced language learning experience.

2.8 Central Intersection and Contextual Knowledge

The central intersection of all three domains—CK, PK, and TK—is the core of the TPACK framework:

- TPACK (Technological Pedagogical Content Knowledge):
  At this central point, teachers integrate content, pedagogy, and technology simultaneously to create effective, meaningful, and engaging learning experiences. For example, designing a language-learning module that uses multimedia storytelling to teach vocabulary, grammar, and pronunciation exemplifies TPACK in practice. Effective TPACK requires teachers to understand the dynamic relationships between content, pedagogy, and technology, rather than treating each domain in isolation.
- Contextual Knowledge (XK):
  In 2019, Mishra proposed an extension of the TPACK framework to include Contextual Knowledge (XK), recognizing that teaching does not occur in a vacuum. XK encompasses the organizational, institutional, and situational factors that influence instruction, such as school policies, available technology, class size, student demographics, and cultural norms. XK ensures that TPACK is implemented appropriately and sustainably, tailored to the specific context of teaching and learning.

2.9 Relevance in Modern Education

TPACK has significant implications for contemporary education:

- Encourages holistic planning: Teachers consider not just content or pedagogy, but how technology can enhance learning in contextually meaningful ways.
- Promotes adaptive instruction: Integrating technology enables personalized learning, supporting diverse learning styles and student autonomy.

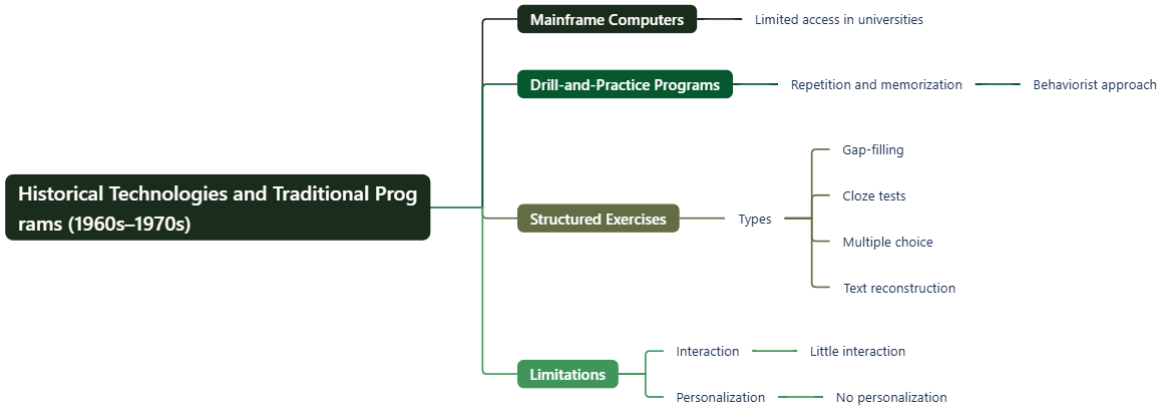
- Guides professional development: TPACK offers a framework for teacher training, helping educators develop competencies in integrated, effective, and reflective use of technology.
- Bridges the gap between theory and practice: It ensures that technology is not used superficially but is connected to learning objectives and pedagogical strategies.

2.9.1 Technologies Supporting Language Learning

Language learning has undergone a significant transformation thanks to technological integration. Under the umbrella of Computer-Assisted Language Learning (CALL), a wide range of Information and Communication Technology (ICT) applications has evolved—from simple drill-and-practice programs to sophisticated tools incorporating Artificial Intelligence (AI) and Virtual Reality (VR). These technologies not only facilitate the practice of the four basic language skills—listening, speaking, reading, and writing—but also promote interaction, learner autonomy, and personalized learning.

2.9.2 Historical Technologies and Traditional Programs

Figure 14. Historical Technologies and Traditional Programs



Source: Author's own elaboration.

During the 1960s and 1970s, CALL programs were characterized by a structured, behaviorist approach, focused on repetition and systematic practice:

- **University mainframe computers:** These were the primary technological resource available in academic institutions, limiting student access to CALL programs.
- **Drill-and-practice programs:** These programs presented a stimulus (typically text-based) and required a specific response from the learner. They relied on behaviorist pedagogy, emphasizing memorization and repetition.
- **Structured program formats:** Examples included gap-filling exercises, Cloze tests, multiple-choice questions, text reconstruction, and basic simulations. Although rigid and non-adaptive, these programs were essential for introducing technology into language education.

While effective for repetitive practice, these early tools had limitations, including lack of authentic interaction and personalization.

2.10 Advances with Microcomputers and Multimedia

By the late 1970s and through the 1980s and 1990s, the emergence of personal microcomputers and multimedia technology marked a turning point in CALL:

- **Multimedia Technology:** Enabled the integration of text, graphics, sound, and animation into a single device. This allowed the development of programs that combined the four basic language skills and offered immersive, contextualized experiences.

  Early tools included **interactive laserdiscs**, which simulated real-life situations.

  Later, **CD-ROMs and DVDs** expanded the availability of multimedia resources, allowing for more autonomous and flexible learning.
- **Computer-Mediated Communication (CMC):** Facilitated interaction and communication among learners and teachers via email, discussion

forums, and chat rooms, supporting collaborative and communicative learning.

- **The World Wide Web:** Introduced a global hypertext system, giving teachers and students access to thousands of authentic foreign-language websites.
- **Interactive Whiteboards:** Provided a space for direct interaction with digital content, enabling annotations, simulations, and collaborative exercises in real time.

These advances represented a paradigm shift, moving from isolated practice exercises to dynamic, interactive, and student-centered learning experiences.

2.10.1 Web 2.0 Tools and Interactive Applications

Since the early 2000s, the rise of Web 2.0 and interactive applications has fostered new forms of collaborative and participatory learning:

- **Blogs and wikis:** Allow learners to create, edit, and share content, encouraging authentic writing and collaboration.
- **Social media platforms:** Facilitate real-time interaction and cultural exchange, promoting communicative practice outside the classroom.
- **Podcasting and audio/video tools:** Provide authentic listening and visual resources, helping learners improve comprehension and pronunciation.
- **Chat rooms and instant messaging platforms:** Simulate conversations in real-life contexts, allowing immediate interaction and active language use.

Web 2.0 tools have transformed language learning, enabling personalization, collaboration, and autonomous study, which were limited in earlier generations of CALL.

2.11 Modern and Emerging Trends

Today, CALL extends beyond traditional web-based environments, integrating Artificial Intelligence (AI), Virtual Reality (VR), and adaptive learning technologies:

- **Intelligent CALL (ICALL):** Uses AI to analyze learners' errors and provide personalized feedback. This includes virtual tutors and intelligent chatbots.
- **Virtual and Augmented Reality:** Offer immersive environments where learners can practice real-life situations safely and contextually.
- **Mobile-Assisted Language Learning (MALL):** Enables learning anytime and anywhere via mobile devices, promoting autonomy and continuous engagement.

These technologies illustrate the evolution of CALL toward interactive, learner-centered, and adaptive language learning, integrating multimedia, global communication, and intelligent analysis of learner data.

ESL Classroom Example 1: Ordering Food in a Restaurant

Level: A2/B1 (Elementary–Intermediate)

Objective: Students will practice conversational English for ordering food, asking questions, and responding appropriately in a restaurant setting.

1. Intelligent CALL (ICALL)

- **Application:** AI-driven virtual tutor analyzes student input and provides corrective feedback.
- **Example:** Students practice dialogue with **ChatGPT or Replika**, role-playing as a customer and waiter.
    - The AI detects grammar or pronunciation errors and suggests corrections.
    - Personalized hints help students reformulate sentences:
        - *Student:* "I want eat pizza."

- *AI Feedback:* "You could say: 'I want to eat pizza.'"

Benefit: Immediate, adaptive feedback supports self-directed improvement and confidence.

2. Virtual and Augmented Reality (VR/AR)

- **Application:** Immersive simulation of a restaurant environment.
- **Example:** Using a VR app, students navigate a virtual restaurant, interact with AI avatars as waiters, read menus, and make orders.
- **Practice Focus:**

  Speaking and listening in realistic contexts.

  Repetition in a safe, low-pressure environment.

  Experiencing cultural norms (politeness, small talk).

Benefit: Contextualized, experiential learning enhances fluency and pragmatic competence.

3. Mobile-Assisted Language Learning (MALL)

- **Application:** Students continue practice outside the classroom on mobile devices.
- **Example:**
  - Using apps like Duolingo or Babbel, learners complete exercises on vocabulary, phrases, and listening comprehension related to restaurants.
  - Mobile quizzes and gamified mini-tasks reinforce learning throughout the day.

Benefit: Flexibility, repeated exposure, and autonomous learning increase retention and engagement.

Integration in the Lesson:

- Students begin with a VR simulation to experience ordering food.
- Follow up with ICALL exercises for feedback and correction.

- Continue learning independently via mobile exercises to consolidate vocabulary and expressions.

- **ESL Classroom Example 2: Booking a Hotel Room**

  Level: A2/B1 (Elementary–Intermediate)

Objective: Students will practice conversational English for booking a hotel room, asking for information, and responding politely in real-life situations.

1. Intelligent CALL (ICALL)

- **Application:** AI virtual tutors analyze student responses and provide instant corrective feedback.
- **Example:** Students role-play booking a hotel with ChatGPT or Replika, as guest and receptionist.
- **AI Feedback:** Corrects grammar, vocabulary, and sentence structure.

  Student: "I want a room two nights."

  AI Feedback: "You could say: 'I would like a room for two nights.'"
- **Benefit:** Adaptive, personalized guidance increases accuracy and confidence.

2. Virtual and Augmented Reality (VR/AR)

- **Application:** Immersive hotel simulation for experiential learning.
- **Example:** Using a VR platform, learners navigate check-in procedures, ask questions, select room options, and interact with AI staff.
- **Practice Focus:** Speaking, listening, and polite conversation in a realistic setting.
- **Benefit:** Low-pressure, contextualized practice enhances fluency and cultural understanding.

3. Mobile-Assisted Language Learning (MALL)

- **Application:** Extend practice outside class via mobile apps.

- **Example:** Using Duolingo, Babbel, or Quizlet, students practice hotel-related vocabulary, dialogues, and comprehension exercises.
- **Benefit:** Flexible, repeated exposure fosters autonomous learning and retention.

Integration in the Lesson:

1. Start with a VR hotel simulation for immersive practice.
2. Follow with ICALL exercises to refine language and receive feedback.
3. Continue practice independently with mobile exercises to reinforce skills and vocabulary.

This structure mirrors real-life language use while combining technology-enhanced, adaptive, and autonomous learning.

2.11 Data-Centered and Lexical Technologies

Other key technologies in language learning focus on linguistic practice and language analysis:

- **Corpora and Concordancers**: Corpora are large collections of authentic texts used for linguistic research and dictionary compilation. Concordancers are tools that allow learners to search a corpus for real examples of language use, enabling them to derive their own rules regarding word meaning and usage. This approach is often referred to as Data-Driven Learning (DDL**)** (Johns, 1991; Boulton, 2010).
- **Spaced Repetition Systems (SRS)**: Flashcard applications use spaced repetition algorithms to enhance vocabulary acquisition by presenting items at intervals optimized for long-term retention. Popular tools include Anki, SuperMemo, and other language-specific applications such as BYKI or phase (Wozniak, 1992; Miao et al., 2016).

These data-centered and lexically-focused technologies complement other CALL applications by providing learners with authentic, usage-based insights and tools for personalized practice. They bridge the gap between theory and

practical usage by exposing learners to real language patterns and optimizing memory retention through systematic repetition.

2.12 Immersive and Mobile Learning Environments

Technological advancements have dramatically expanded the traditional classroom, creating immersive and mobile learning opportunities that allow language learners to engage with content anytime, anywhere. Immersive technologies—such as Virtual Reality (VR) and Augmented Reality (AR)—offer simulated environments where learners can interact in authentic contexts. For example, ESL students can explore a virtual marketplace, participate in role-play conversations with AI avatars, or navigate a virtual airport, practicing both language and cultural norms in a safe, controlled setting. These environments support communicative competence by enabling repeated practice, immediate feedback, and experiential learning aligned with real-world scenarios.

At the same time, mobile-assisted language learning (MALL) allows learners to continue practice outside the classroom via smartphones, tablets, or other portable devices. Mobile apps such as Duolingo, Babbel, and Memrise provide interactive exercises, gamified challenges, and personalized learning pathways that adapt to the learner's proficiency and pace. By enabling microlearning, spaced repetition, and anytime-anywhere access, MALL promotes learner autonomy and continuous engagement, complementing traditional instruction and immersive experiences.

From a theoretical perspective, immersive and mobile learning environments align with constructivist principles, allowing learners to actively construct knowledge in context, and with Cognitive Load Theory, by scaffolding information through multimodal cues (visual, auditory, kinesthetic) to enhance comprehension and retention (Sweller, 1988). Additionally, these approaches address affective factors, such as motivation, confidence, and anxiety, by offering low-stress, engaging, and interactive opportunities for language use.

In practice, combining immersive VR experiences with mobile reinforcement can create a blended, learner-centered model in which students interact meaningfully with the language, receive immediate feedback, and gradually build proficiency while remaining motivated and autonomous.

2.12.1 Virtual Worlds

Virtual worlds provide interactive, immersive, and social spaces where learners can practice language skills in meaningful contexts. Their development can be traced back to early text-based simulations and adventure games of the 1970s and 1980s, which laid the foundation for collaborative online learning environments.

1. Early Text-Based Environments

- MUDs (Multi-User Dungeons) and MOOs (MUD, Object-Oriented) were among the first virtual worlds designed for multiple users to interact simultaneously.
- In these platforms, learners engaged in role-play, problem-solving, and collaborative storytelling, communicating exclusively in the target language.
- Such environments emphasized negotiation of meaning, turn-taking, and writing fluency, allowing students to develop linguistic and social skills within a shared narrative context.

2. Modern 3D Virtual Worlds

- Contemporary platforms like Second Life, OpenSim, or educational VR environments provide graphical, immersive spaces where learners can navigate virtual cities, attend events, or participate in simulations.
- Students interact with peers or AI-driven avatars, practicing real-life communication, cultural norms, and context-specific vocabulary.

- These worlds allow experiential learning, where learners' actions produce immediate consequences, fostering deeper engagement and retention (Peterson, 2010).

3. Pedagogical and Theoretical Implications

- **Constructivist learning theory** underpins the use of virtual worlds: learners actively construct knowledge by exploring, interacting, and experimenting within meaningful, contextualized environments.
- **Sociocultural theory** is also relevant, emphasizing collaborative learning, scaffolding, and social interaction in language acquisition (Vygotsky, 1978).
- Virtual worlds reduce affective filters by providing low-pressure, safe environments where learners can take risks and practice without fear of judgment (Krashen, 1985).

4. ESL Classroom Applications

- **Virtual role-plays:** Students act out scenarios such as ordering in a restaurant, checking into a hotel, or conducting interviews.
- **Project-based learning:** Learners collaborate to design virtual exhibitions, presentations, or cultural tours in the target language.
- **Language quests and gamified tasks:** Assignments integrated into the virtual world, such as scavenger hunts or interactive dialogues with NPCs (non-player characters), promote motivation and engagement.
- **Assessment and feedback:** Teachers can observe and evaluate communication, problem-solving, and collaboration skills in real-time or through recorded sessions.

By combining social interaction, immersion, and contextualized practice, virtual worlds offer a dynamic, learner-centered environment that complements traditional instruction and other CALL applications. They exemplify how technology can transform language learning into an experiential, interactive, and meaningful process.

2.13 Mobile-Assisted Language Learning (MALL) and Virtual Learning Environments (VLE)

- **MALL** enables learning anytime and anywhere using smartphones, tablets, or wearable devices. It promotes learner autonomy and continuous engagement through apps, quizzes, and gamified tasks.
- **VLEs** provide structured online environments with multimedia content, interactive exercises, and communication tools for blended or fully online courses (Stockwell, 2010).

ESL Classroom Example1 : MALL and VLE Integration

Context:

An intermediate-level ESL class of adult learners in a blended learning program.

MALL Activities:

- Students use a mobile app (e.g., Duolingo, Quizlet, or Memrise) to practice daily vocabulary and grammar exercises.
- Push notifications remind learners to complete microlearning tasks, such as listening to short dialogues or recording pronunciation.
- Gamified challenges, like completing weekly vocabulary quizzes, encourage competition and sustained engagement.

VLE Activities:

- The class is supported by a Virtual Learning Environment (e.g., Moodle or Google Classroom), where teachers upload lesson content, discussion prompts, and multimedia exercises.
- Students participate in asynchronous forums to share written reflections on readings, practicing both writing and reading comprehension.
- Synchronous sessions using video conferencing allow live speaking practice, group discussions, and role-play activities in simulated real-life scenarios.

Integration Benefits:

- Learners experience flexibility, practicing language skills anytime through MALL and deepening comprehension in structured VLE activities.
- Teachers can monitor progress using analytics from both platforms, offering personalized feedback based on performance and engagement.
- Combining MALL and VLE promotes autonomy, interaction, and scaffolding, aligning with communicative and constructivist approaches to language learning.

Example Task:

- Vocabulary Revision Task: Students explore a virtual supermarket in a VLE module, identifying items and phrases. They then complete a mobile quiz to reinforce vocabulary, practicing spelling, pronunciation, and contextual usage.

- **ESL Classroom Example 2: MALL and VLE Integration – Booking Travel Tickets**

Context: Intermediate ESL learners in a blended learning program (B1 level).

MALL Activities

- Students use mobile apps (e.g., Duolingo, Quizlet) to practice travel-related vocabulary, phrases, and sentence structures.
- Push notifications remind learners to complete short exercises, like listening to dialogues at a train station or airline counter.
- Gamified quizzes encourage competition and sustained engagement.

VLE Activities

- The class uses a Virtual Learning Environment (e.g., Moodle, Google Classroom) to access lesson content, videos, and interactive exercises.
- Students participate in asynchronous discussion boards, writing reflections or travel plans.

- Synchronous video sessions allow role-plays, such as booking a train ticket or flight, asking about schedules, and resolving booking issues.

Integration Benefits

- Flexible practice: MALL for on-the-go exercises, VLE for structured learning.
- Teachers monitor progress through analytics and provide personalized feedback.
- Supports learner autonomy, scaffolding, and communicative competence.

Example Task

- **Travel Booking Simulation:** In the VLE, students explore a virtual train station or airport, identify vocabulary, and plan a trip.
- They then complete a mobile quiz reinforcing ticket phrases, pronunciation, and conversational structures.

This lesson integrates mobile and online platforms to provide authentic, interactive, and context-rich language practice.

2.13.1 Human Language Technologies and Artificial Intelligence

Human Language Technologies (HLT) and Artificial Intelligence (AI) have created more adaptive and personalized learning systems:

- **Natural Language Processing (NLP)**: Supports automated analysis of learner input and facilitates interaction with chatbots and virtual tutors.
- **Speech Synthesis (TTS)**: Converts text to speech, helping learners hear correct pronunciation, often integrated into electronic dictionaries.
- **Automatic Speech Recognition (ASR)**: Allows learners to practice pronunciation by comparing their speech to native models.
- **Parsing (Syntactic Analysis)**: Analyzes learner responses to diagnose errors and illustrate sentence structure.

- **Intelligent CALL (ICALL)**: AI-based systems that provide adaptive, personalized feedback.
- **AI-Powered Platforms**: Include virtual tutors, chatbots, and voice recognition systems that simulate interactive dialogues for tailored language practice (Heift & Schulze, 2007).

2.13.2 Virtual Reality (VR)

VR offers transformative opportunities for immersive language learning:

- **Real-World Simulations**: Learners can practice realistic conversations with AI-driven avatars or peers in controlled environments.
- **Immersive Environments**: Provide rich, contextually meaningful interaction to improve fluency, pronunciation, and communicative competence.
- **Real-Time Feedback**: Integration of speech recognition technology allows immediate correction and feedback on pronunciation and language use (Chen, 2020).

2.13.3 Examples of Applications

Modern applications and platforms that support language learning include:

- Duolingo
- Memrise
- IXL
- Quizlet
- HelloTalk
- Babbel
- FluentU
- Speaking Pal
- iTalki

These tools illustrate the convergence of immersive technologies, AI, mobile learning, and interactive platforms to foster autonomous, communicative, and context-rich language learning experiences.

- **ESL Classroom Example1 : Virtual Reality (VR) for Language Learning**

Context: Intermediate-level ESL learners in a blended course combining face-to-face instruction with VR activities.

VR Activities:

1. **Real-World Simulations:**

   Students enter a virtual café environment and practice ordering food, asking for directions, or making small talk with AI avatars. Each scenario is designed to mirror authentic situations they might encounter in an English-speaking country.

2. **Immersive Environments:**

   Virtual marketplaces, airports, and social gatherings allow students to explore spaces, interact with objects, and communicate contextually.

   Learners practice vocabulary, grammar, and sentence structures in meaningful scenarios rather than isolated drills.

3. **Real-Time Feedback:**
   - Speech recognition and AI-driven tutors provide immediate guidance on pronunciation, intonation, and word choice.
   - For example, if a student mispronounces "sandwich," the system highlights the error, demonstrates the correct pronunciation, and allows repeated practice.

Integration Benefits:

- Enhances **communicative competence** by simulating authentic interaction in a low-stress environment.
- Supports **fluency development** through repeated practice without fear of judgment.
- Reduces **cognitive load** by combining visual, auditory, and kinesthetic cues in one immersive experience.
- Enables **teacher monitoring** through logs of interactions, common errors, and progression in communicative tasks.

Example Task:

- **Virtual Airport Role-Play:** Students navigate check-in, security, and boarding procedures, speaking to avatars in English. After the simulation, the teacher reviews errors, provides corrective feedback, and encourages reflection on language use and strategies.

- **ESL Classroom Example 2: Virtual Reality (VR) for Hotel Check-In**

Context: Intermediate ESL learners (B1) in a blended course combining face-to-face lessons with VR activities.

VR Activities

1. **Real-World Simulations:**

- Students practice checking into a virtual hotel, asking about room types, amenities, and local services.
- Scenarios mirror authentic situations in English-speaking countries, including handling booking issues or special requests.

2. **Immersive Environments:**

   ✓ Virtual hotel lobby, concierge desk, and rooms allow students to explore spaces, interact with objects, and use language contextually.

   ✓ Vocabulary, grammar, and polite expressions are practiced in meaningful interactions rather than isolated exercises.

3. **Real-Time Feedback:**

- AI tutors and speech recognition provide immediate guidance on pronunciation, sentence structure, and word choice.
- Example: If a student says, "I want single room," the system suggests: "I would like a single room, please."

Integration Benefits

- Builds communicative competence in authentic, low-stress contexts.
- Improves fluency through repeated, safe practice.

- Reduces cognitive load via multisensory VR cues (visual, auditory, kinesthetic).
- Enables teacher monitoring through interaction logs, error tracking, and performance analysis.

Example Task

- **Virtual Hotel Role-Play:**
  Students simulate checking into a hotel, asking for services, and resolving issues with VR avatars.
- Post-simulation, the teacher provides corrective feedback, highlights errors, and encourages reflection on effective communication strategies.

This VR activity gives learners immersive, contextualized, and interactive practice that supports fluency, confidence, and real-world readiness.

- **ESL Classroom Example 3: Virtual Reality (VR) for Doctor's Visit**

Context: Intermediate ESL learners (B1–B2) in a blended course combining in-class lessons with VR practice.

VR Activities

1. **Real-World Simulations:**

✓ Students enter a virtual clinic where they must explain symptoms, ask questions about treatment, and understand the doctor's advice.

✓ Scenarios simulate authentic medical interactions, including filling forms, discussing prescriptions, and describing past medical history.

2. **Immersive Environments:**

✓ Virtual waiting room, examination room, and pharmacy allow learners to interact with objects, read signs, and communicate contextually.

✓ Vocabulary, grammar, and sentence structures are practiced naturally within meaningful dialogues.

3. **Real-Time Feedback:**

✓ Speech recognition and AI tutors provide instant guidance on pronunciation, sentence accuracy, and appropriate medical expressions.

✓ Example: If a student says, "I have hurt my head," the system suggests: "I have a headache" or "My head hurts."

Integration Benefits

- Encourages authentic communication in practical, real-life contexts.
- Develops fluency, comprehension, and polite interaction skills.
- Reduces cognitive load by combining auditory, visual, and kinesthetic cues.
- Provides teachers with data to track errors, correct misconceptions, and monitor progress.

Example Task

Virtual Clinic Role-Play:

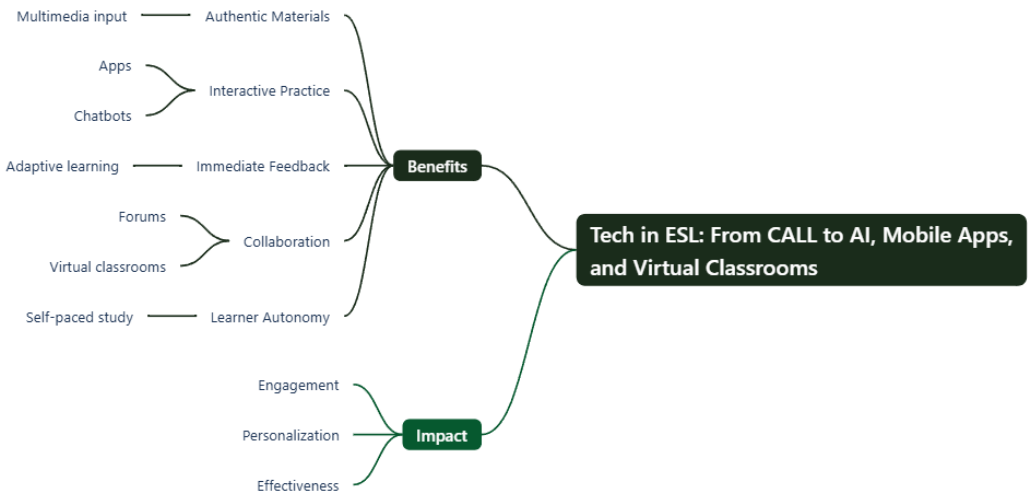
- Students describe symptoms to a virtual doctor, follow instructions, ask questions, and simulate taking medication.
- After the simulation, the teacher reviews performance, gives feedback, and facilitates reflection on language use and strategies.

This activity immerses learners in medical communication, strengthening vocabulary, listening, speaking skills, and confidence in professional settings.

CHAPTER 3

3. Integrating Technology in ESL Classes

Figure 15. Integrating Technology in ESL Classes



Source: Author's own elaboration.

3.1. Introduction

The rapid development of digital technologies has profoundly transformed the landscape of English language teaching (ELT) in both ESL (English as a Second Language) and EFL (English as a Foreign Language) contexts. From the introduction of computer-assisted language learning (CALL) in the 1980s to the current era of artificial intelligence, mobile learning, and virtual classrooms, technology has become integral to contemporary pedagogical practice (Benson & Reinders, 2011; Chapelle, 2016). Modern classrooms—face-to-face, hybrid, or fully online—rely on digital tools that enhance communication, collaboration, creativity and critical thinking, skills often referred to as the "4Cs" of 21st-century competence (P21, 2019).

For English teachers, integrating technology is no longer an optional supplement but a pedagogical imperative. Learners now expect digital content, interactive activities, and multimodal resources; institutions demand efficiency, data-driven assessment, and digital literacy; and global communication increasingly depends on English as a lingua franca across

digital networks (Crystal, 2019). As a result, integrating technology in language education is crucial not only for linguistic development but also for preparing learners to function in academic, professional, and intercultural environments. This chapter explores the major theoretical foundations, pedagogical benefits, common tools, and best practices for incorporating technology in ESL/EFL settings. It also offers practical examples, discusses challenges, and highlights emerging trends that will shape future instruction.

3.2. Why Technology Matters in Language Learning

Technology supports language learning in ways that traditional methods alone often cannot. Scholars consistently highlight that digital tool enable rich input, frequent interaction, and meaningful output—the three conditions essential for second-language acquisition (Long, 1996; Swain, 2005). Integrating technology into language learning offers several key benefits: it provides access to authentic language materials through multimedia resources, exposing learners to diverse accents, contexts, and registers; it facilitates interactive practice via chatbots, language apps, and online exercises, promoting communicative competence; it allows immediate feedback through automated assessments and adaptive learning systems, helping learners correct errors and track progress; it supports collaborative learning through forums, virtual classrooms, and social media, enabling meaningful peer interaction; and it encourages learner autonomy, allowing individuals to pace their study, choose materials aligned with their interests, and engage in self-directed practice. Overall, technology enriches the language learning environment, making it more engaging, personalized, and effective.

3.2.1. Increased Motivation and Engagement

Learners tend to show higher motivation and persistence when using digital tools. Video clips, interactive quizzes, gamified tasks, digital simulations, and virtual field trips provide engaging input that mirrors authentic contexts (Dörnyei, 2020). Multimodal environments integrate text, audio, visuals,

animations, and gestures—modes that support comprehension through redundancy and contextualization (Mayer, 2021).

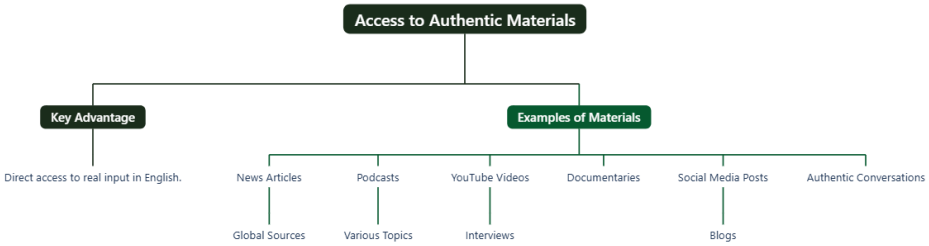
Examples include:

- Gamified activities such as Quizizz or Kahoot, which stimulate competition and reward progress.
- Interactive storytelling apps that let learners manipulate narratives.
- Virtual reality (VR) experiences that simulate real-life situations like ordering food or traveling abroad.

Research shows that digital tools enhance emotional engagement, which is a driving force behind language learning persistence (Reinders & Wattana, 2015).

3.2.2. Access to Authentic Materials

Figure 16. Access to Authentic Materials



Source: Author's own elaboration.

One of the most significant advantages of digital learning is the ready availability of authentic English input. Modern technology enables teachers to incorporate a wide variety of authentic materials, including:

- **News articles** from global outlets
- **Podcasts** on diverse topics
- **YouTube interviews** and talk shows
- **Documentaries**
- **Social media posts**

- **Authentic conversations and blogs**

Authentic materials expose learners to natural speech patterns, colloquial vocabulary, pragmatics, cultural references, and discourse structures. Such exposure is particularly valuable in EFL (English as a Foreign Language) contexts, where learners often have limited opportunities to interact directly with native speakers (Gilmore, 2007).

Moreover, digital access facilitates extensive listening and reading, two activities that have been strongly linked to vocabulary growth, comprehension, and overall fluency development (Day & Bamford, 2002). Learners benefit not only from exposure to varied linguistic forms but also from culturally embedded uses of language, which help develop pragmatic competence and contextual understanding.

Digital platforms also enable personalized and self-paced engagement, allowing students to select materials relevant to their interests and proficiency levels. This autonomy supports learner motivation, encourages independent study, and increases the likelihood of sustained interaction with the target language.

3.2.3. Support for Autonomy and Personalized Learning

Learner autonomy—a learner's ability to take charge of their own learning—is one of the most powerful predictors of long-term success (Little, 2007). Technology enhances autonomy through:

- Self-paced learning platforms (e.g., Duolingo, BBC Learning English)
- LMS systems that allow students to review lessons anytime
- Automated feedback tools that provide instant correction
- Adaptive learning apps that modify difficulty levels

These tools allow learners to set personal goals, monitor progress, and engage in meaningful practice outside the classroom.

3.2.4. Digital Literacy in English Language Learning

Figure 17. Digital Literacy in ELL

Source: Author's own elaboration.

Digital literacy refers to the ability to interpret, evaluate, and produce content in digital environments. It encompasses skills such as:

- ✓ **Interpreting online content** and understanding multimodal information
- ✓ **Evaluating credibility** and detecting misinformation
- ✓ **Navigating digital platforms** efficiently
- ✓ **Communicating effectively** in online spaces
- ✓ **Using digital tools responsibly** and ethically

Since English dominates online communication, EFL learners who develop digital literacy simultaneously strengthen their language competence, particularly reading comprehension, writing, and vocabulary acquisition (Leu et al., 2017). Exposure to authentic English online provides learners with context-rich language input that reinforces both linguistic and digital skills.

Moreover, digital literacy is closely linked to employability. Modern workplaces demand proficiency in communicating via email, collaborating on online platforms, producing digital documents, and analyzing data. Integrating technology and digital skills into English instruction not only enhances language learning but also prepares students for real-world professional contexts, bridging the gap between academic competence and workplace readiness.

Educators can foster digital literacy by incorporating activities such as critical evaluation of online texts, collaborative projects using cloud-based tools, participation in discussion forums, and creation of digital content like blogs or podcasts. These practices promote active, learner-centered engagement, improving both linguistic competence and digital fluency.

3.3. Types of Technology for ESL/EFL Classes

Technology used in language teaching encompasses hardware, software, platforms, and digital media. Understanding the characteristics of each category helps teachers make informed pedagogical decisions.

3.3.1. Hardware Tools

Hardware provides the physical infrastructure for digital learning.

Interactive Whiteboards (IWBs)

IWBs enable teachers to display multimedia, annotate texts, and interact dynamically with content. Their visual affordances support vocabulary learning, pronunciation practice, and group collaboration (Cutrim Schmid & Whyte, 2012).

Tablets and Mobile Phones

Mobile learning (m-learning) emphasizes portability and accessibility (Kukulska-Hulme, 2016). Smartphones allow:

- Quick internet searches
- Voice and video recording
- Pronunciation apps
- QR-code activities
- Interactive polls
- Location-based tasks

Because mobile phones are widely available, especially in developing countries, they democratize access to digital learning.

- Document Cameras

These tools allow teachers to project physical materials, annotate them digitally, and display student work for feedback—bridging traditional and digital modalities.

Case example: Vocabulary and Speaking Activity Using Hardware Tools (B1 Level)

Objective: Expand vocabulary related to daily routines and practice speaking fluently in English.

Hardware Tools Used:

- Interactive Whiteboard (IWB)
- Tablets or Mobile Phones
- Document Camera

Activity Steps:

1. **Introduction (IWB + Document Camera):**
    - ✓ The teacher projects a short text about a typical day in the life of a student using the document camera to display a printed diary entry.
    - ✓ On the IWB, key vocabulary (verbs, nouns, expressions) is highlighted and annotated. Students repeat the words aloud, practicing pronunciation.
2. **Vocabulary Practice (Mobile Phones/Tablets):**
    - ✓ Students use language apps (e.g., Quizlet or Memrise) on their tablets or smartphones to complete interactive flashcards and mini-quizzes related to the vocabulary.
    - ✓ Students can also record their pronunciation using voice-recording apps and compare it to native speaker models.
3. **Interactive Task (IWB + Mobile Phones):**
    - ✓ Using the IWB, the teacher displays images representing daily activities (e.g., brushing teeth, going to school, cooking).

- ✓ Students scan QR codes next to each image with their mobile phones to receive sentence prompts, which they then use to form short oral descriptions of their own daily routines.
- ✓ Responses are shared with the class for peer feedback.

4. **Group Collaboration (IWB):**
    - Students come to the IWB to match images with sentences they created on their devices, reinforcing vocabulary and sentence structure.
    - The teacher annotates and corrects as necessary, providing instant feedback.

Learning Outcomes:

- Enhanced B1-level vocabulary related to everyday routines
- Improved pronunciation and oral fluency
- Practice in autonomous and collaborative digital learning
- Experience combining traditional materials with interactive digital tools

Case example 2 – Vocabulary & Speaking with Hardware (B1 Level)

Objective: Expand daily routine vocabulary and improve oral fluency.

Tools Used:

- ✓ Interactive Whiteboard (IWB)
- ✓ Tablets / Mobile Phones
- ✓ Document Camera

Activity Steps:

1. **Introduction (IWB + Document Camera):**
    - ✓ Project a short diary text.
    - ✓ Highlight key vocabulary on IWB; students repeat aloud.
2. **Vocabulary Practice (Tablets/Phones):**
    - ✓ Use apps (Quizlet/Memrise) for flashcards and quizzes.
    - ✓ Record and compare pronunciation with native models.
3. **Interactive Task (IWB + Phones):**

- ✓ Display daily activity images on IWB.
- ✓ Scan QR codes for sentence prompts and describe routines orally.
- ✓ Share responses for peer feedback.

4. **Group Collaboration (IWB):**
    - ✓ Match images with sentences created by students.
    - ✓ Teacher provides real-time feedback.

Learning Outcomes:

- Expanded vocabulary on daily routines
- Improved pronunciation and fluency
- Hands-on practice combining traditional and digital tools
- Enhanced autonomous and collaborative learning

3.3.2. Learning Management Systems (LMS)

Learning Management Systems (LMS) are digital platforms designed to plan, deliver, and manage educational content and training programs in a centralized environment. They allow educators and trainers to create courses, organize lessons, distribute learning materials, administer assessments, and track learner progress. LMS platforms often include features such as discussion forums, quizzes, multimedia integration, analytics dashboards, and gamification elements to enhance engagement and personalize learning experiences. Widely used in schools, universities, and corporate training, LMSs streamline administrative tasks, support blended and remote learning, and provide learners with flexible, anytime-anywhere access to resources, fostering consistent, scalable, and measurable learning outcomes.

LMS platforms such as Google Classroom, Moodle, Canvas, Schoology, and Edmodo are essential in blended and online learning. They provide:

- Repositories for materials
- Assignment submission portals
- Automated quizzes

- Feedback channels
- Communication tools

LMS environments support student tracking and data-driven instruction, helping teachers differentiate learning based on performance analytics (Al-Mahrooqi & Troudi, 2014).

- **Case example 1: Using an LMS for B1 English Students**

Objective: Enhance reading comprehension, vocabulary acquisition, and writing skills through structured LMS activities.

LMS Platforms: Google Classroom, Moodle, or Canvas

Activity Steps:

1. **Course Materials Repository:**
   - ✓ Teacher uploads a short story or news article suitable for B1 learners.
   - ✓ Supplementary materials include a vocabulary list, audio recordings of the text, and illustrations.
   - ✓ Students can access the materials anytime for independent study.
2. **Interactive Quizzes and Assignments:**
   - ✓ Vocabulary quizzes created in the LMS with multiple-choice, gap-fill, and matching exercises.
   - ✓ Reading comprehension questions graded automatically to provide immediate feedback.
3. **Discussion Forums:**
   - ✓ Students post short summaries or reflections on the reading.
   - ✓ Teacher encourages peer interaction by having students comment on each other's posts, correcting grammar and suggesting alternative expressions.
4. **Writing Assignment Submission:**
   - ✓ Students write a short essay or diary entry related to the reading topic and submit it via the LMS.

- ✓ Teacher provides annotated feedback, highlighting vocabulary and grammar improvements.

5. **Analytics and Tracking:**
   - ✓ Teacher monitors progress via LMS dashboards, tracking quiz scores, assignment completion, and forum participation.
   - ✓ Students who struggle receive personalized activities or extra resources.
6. **Gamification & Engagement:**
   - ✓ Badges or points can be awarded for completed quizzes, forum participation, and timely submissions.
   - ✓ This motivates learners and encourages consistent engagement with the content.

Learning Outcomes:

- Improved reading comprehension and vocabulary retention.
- Practice in writing and peer feedback.
- Autonomous learning supported by anytime-anywhere access to materials.
- Teacher can differentiate instruction based on performance analytics.

Case example 2: Using an LMS for B1 English Students

Level: B1 (Intermediate)

Objective: Improve reading comprehension, vocabulary, and writing through structured LMS activities.

1. **Learning Management System (LMS) Integration**
   - ✓ **Application:** The teacher uses a platform like Google Classroom, Moodle, or Canvas to organize all course materials, tasks, and assessments.
   - ✓ **Example:** Students access a short story or news article uploaded by the teacher. Audio recordings, vocabulary lists, and illustrations accompany the text to enhance understanding.

- ✓ **Benefit:** Centralized resources allow learners to study independently anytime, promoting autonomy.

2. **Interactive Quizzes and Assignments**
   - ✓ **Application:** Vocabulary, grammar, and comprehension exercises are created in the LMS.
   - ✓ **Example:** Multiple-choice questions, gap-fill activities, and matching exercises on the uploaded text. Reading comprehension questions are automatically graded.
   - ✓ **Benefit:** Immediate feedback helps students correct mistakes and reinforce learning.

3. Discussion Forums

- ✓ **Application:** Students post summaries, reflections, or responses to prompts in LMS forums.
- ✓ **Example:** Students comment on each other's posts, discuss vocabulary usage, and share interpretations of the reading.
- ✓ **Benefit:** Encourages authentic written interaction, peer feedback, and collaborative learning.

4. Writing Submissions

- ✓ **Application:** Students write short essays, diary entries, or responses related to the reading and submit them via the LMS.
- ✓ **Example:** The teacher provides annotated feedback highlighting grammar, vocabulary, and expression improvements.
- ✓ **Benefit:** Supports autonomous writing practice with structured guidance.

5. Analytics and Tracking

- ✓ **Application:** LMS dashboards allow the teacher to monitor progress, quiz performance, assignment completion, and forum participation.
- ✓ **Example:** Students struggling with certain vocabulary or comprehension receive additional exercises or resources.
- ✓ **Benefit:** Enables personalized instruction and timely intervention.

6. Gamification and Engagement

- ✓ **Application:** Badges, points, or leaderboards motivate students to complete quizzes, participate in forums, and submit assignments on time.
- ✓ **Example:** Students earn points for each completed task and can track their progress compared to peers.
- ✓ **Benefit:** Increases motivation, engagement, and consistent participation.

Integration in the Lesson

- ✓ Students first read the assigned text independently, completing vocabulary and comprehension exercises in the LMS.
- ✓ They post reflections or summaries in discussion forums and comment on peers' posts.
- ✓ Next, they write a short essay related to the topic and submit it through the LMS for teacher feedback.
- ✓ Analytics help the teacher identify students needing extra support and provide personalized reinforcement.

Learning Outcomes

- ✓ Improved reading comprehension and vocabulary retention
- ✓ Practice in writing and peer feedback
- ✓ Increased learner autonomy and engagement
- ✓ Personalized learning through teacher monitoring and LMS analytics

3.3.3. Multimedia Tools

Multimedia tools enrich lessons with video, audio, and visual content. Multimedia tools are digital applications and platforms that integrate text, audio, images, video, and animation to create rich, interactive learning experiences. In educational settings, these tools enhance comprehension, engagement, and retention by presenting information in multiple formats, catering to diverse learning styles. Examples include video editors, presentation software, animation tools, audio recording apps, and interactive

simulations. Multimedia tools support activities such as storytelling, language practice, virtual experiments, and project-based learning, allowing learners to visualize concepts, practice skills, and express understanding creatively. By combining various media, these tools make learning more dynamic, immersive, and accessible across physical and virtual classrooms.

Video Platforms

Video platforms extend learning by providing rich, authentic content that enhances comprehension, engagement, and language skills. Platforms such as YouTube EDU, TED-Ed, National Geographic, and BBC Learning English offer instructional videos, expert talks, interviews, and documentaries that expose learners to real-world language use, diverse accents, and cultural contexts. These resources support listening and speaking development by modeling pronunciation, intonation, and conversational patterns, while also fostering critical thinking through thought-provoking content. Additionally, video platforms allow learners to pause, replay, and review material at their own pace, promoting autonomous learning and providing opportunities for discussion, reflection, and interactive activities in both classroom and remote settings.

Audio Tools

Audio tools significantly enhance language learning by providing immersive listening and speaking experiences that traditional methods alone may not offer. Podcast platforms expose learners to authentic speech, diverse accents, and real-life conversations, improving comprehension and cultural understanding. Text-to-speech and speech-to-text software support pronunciation, fluency, and writing skills by allowing learners to hear accurate models of words and convert spoken language into text for analysis. Pronunciation analyzers give immediate feedback on articulation, intonation, and stress patterns, helping learners refine their spoken language. Digital recorders enable learners to capture and review their own speech, facilitating

self-assessment and targeted practice. Together, these tools create flexible, interactive, and personalized opportunities for developing oral and aural proficiency.

Visual Tools

Visual tools enhance reading and writing skills by enabling learners to represent information in engaging, multimodal formats. Tools such as infographic makers, digital poster creators, slide presentations, and animation software allow students to organize ideas visually, summarize content, and convey complex information clearly. By combining text, images, charts, and motion, these tools promote critical thinking, creativity, and digital literacy, helping learners interpret and produce information effectively. Additionally, visual tools support collaborative projects, presentations, and storytelling, making reading and writing activities more interactive, accessible, and aligned with contemporary digital learning standards.

Case Study 1: Integrating Multimedia Tools in a B1 English Classroom

Objective: Enhance listening, speaking, reading, writing, and digital literacy skills using multimedia tools.

Context: A B1-level English course in a blended learning environment, combining face-to-face and online sessions.

1. Video Platforms

Tools: YouTube EDU, TED-Ed, BBC Learning English, National Geographic

Application:

- Teacher selects a short documentary on a cultural topic (e.g., festivals around the world).
- Students watch the video on their tablets or computers, pausing and replaying sections for comprehension.
- Comprehension and speaking activities:
  - ✓ Summarize the video orally in small groups.
  - ✓ Answer multiple-choice or open-ended questions in the LMS.
  - ✓ Practice pronunciation by repeating phrases and sentences from native speakers in the video.

Learning Outcomes:

- Improved listening comprehension and pronunciation.
- Exposure to authentic accents and cultural content.
- Enhanced ability to summarize and discuss information.
- **Case Study 2: Integrating Multimedia Tools in a B1 English Classroom**

  Level: B1 (Intermediate)

  Objective: Develop listening, speaking, reading, writing, and digital literacy skills using multimedia resources.

1. **Video Platforms**

- **Tools:** YouTube EDU, TED-Ed, BBC Learning English, National Geographic

- **Application:** The teacher selects a short documentary or cultural video (e.g., global festivals).
- **Example Activities:**
  - ✓ Students watch the video on tablets or computers, pausing to check understanding.
  - ✓ Summarize orally in small groups, practicing fluency and pronunciation.
  - ✓ Answer multiple-choice or open-ended comprehension questions in the LMS.
  - ✓ Repeat sentences or phrases from native speakers for pronunciation practice.
- **Benefit:** Combines listening, speaking, and comprehension with authentic cultural content.

2. Interactive Multimedia Activities

- **Tools:** Kahoot, Quizlet, Padlet, or Nearpod
- **Application:** Reinforce vocabulary, idioms, and key concepts from the video.
- **Example Activities:**
  - ✓ Students match words or phrases with images or definitions.
  - ✓ Create short digital posters or presentations summarizing cultural topics.
  - ✓ Participate in live quizzes or polls to test comprehension and engage in gamified learning.
- **Benefit:** Enhances vocabulary retention, digital literacy, and student engagement.

3. **Writing and Discussion**

- **Tools:** LMS discussion boards, Google Docs, or Padlet
- **Application:** Encourage reflective and collaborative writing.
- **Example Activities:**

- ✓ Students write a brief report or blog post summarizing the video topic.
- ✓ Comment on peers' posts, asking questions or suggesting alternative expressions.
- ✓ Share personal opinions or experiences related to the cultural theme.

- **Benefit:** Integrates reading, writing, critical thinking, and collaborative learning.

4. Integration in the Lesson

- ✓ Students first watch the video individually or in pairs, taking notes.
- ✓ In-class, they summarize content orally and answer comprehension questions.
- ✓ Multimedia apps reinforce vocabulary and provide interactive practice.
- ✓ Students post reflections or summaries online, receiving peer and teacher feedback.

Learning Outcomes

- ✓ Improved listening comprehension and pronunciation
- ✓ Expanded vocabulary and reading/writing skills
- ✓ Greater digital literacy and familiarity with multimedia tools
- ✓ Enhanced engagement through interactive and authentic learning experiences
- ✓ Exposure to cultural knowledge and authentic language use

2. Audio Tools

Tools: Podcasts, text-to-speech (TTS), speech-to-text (STT), digital recorders, pronunciation analyzers

Application:

- Students listen to a B1-level English podcast on travel tips.
- Using STT software, they convert short spoken summaries into written text to check accuracy.

- Students record themselves retelling the podcast content and use pronunciation analyzers to refine stress, intonation, and articulation.
- Teacher provides feedback through the LMS.

Learning Outcomes:

- Improved oral fluency and listening comprehension.
- Increased awareness of pronunciation, intonation, and rhythm.
- Development of autonomous learning skills.

3. Visual Tools

Tools: Infographic makers, digital poster creators, slide presentation software, animation tools

Application:

- Students create a digital poster summarizing vocabulary and phrases from a unit on environmental issues.
- Infographics include images, short sentences, charts, and key vocabulary.
- In a collaborative activity, groups combine posters into a shared digital slideshow.
- Students present their work to the class via interactive whiteboards or the LMS.

Learning Outcomes:

- Enhanced reading and writing skills through synthesis and summarization.
- Improved ability to organize and present information visually.
- Increased engagement and creativity in producing digital content.

4. Integration Strategy

- **Blended Learning Approach:** Face-to-face sessions for discussions and oral practice; online sessions for watching videos, listening to podcasts, and creating digital visuals.
- **Autonomy & Feedback:** Students can access materials anytime, and teachers provide personalized feedback using LMS analytics.

- **Assessment:** Combines digital portfolios (infographics, recordings) and quizzes on comprehension and vocabulary.

By leveraging video, audio, and visual tools, B1 learners can engage with English through **multimodal, interactive experiences**. Multimedia tools support comprehension, production, pronunciation, and creativity while fostering autonomy, collaboration, and digital literacy.

3.4. Principles for Effective Technology Integration

Effective technology integration in education requires purposeful alignment between digital tools and learning objectives, ensuring that technology enhances rather than distracts from pedagogy. Teachers must consider how tools support active engagement, collaboration, and critical thinking, rather than using technology for its own sake. Several theoretical frameworks, such as the TPACK (Technological Pedagogical Content Knowledge) model and SAMR (Substitution, Augmentation, Modification, Redefinition) framework, guide educators in designing meaningful digital learning experiences. These frameworks emphasize understanding the interplay between content, pedagogy, and technology, helping teachers select appropriate tools, scaffold learning, and foster learner autonomy. Ultimately, intentional integration ensures that technology enriches instruction, promotes deeper understanding, and aligns with curriculum goals.

3.4.1. The SAMR Model

Puentedura's SAMR model (2006) helps teachers evaluate how technology transforms learning.

1. **Substitution** – technology replaces a traditional tool
   Example: typing a paragraph instead of handwriting.
2. **Augmentation** – technology adds functional improvement
   Example: using grammar-checking software.

3. **Modification** – technology redesigns a task
   Example: collaborative writing using Google Docs.
4. **Redefinition** – technology enables tasks otherwise impossible
   Example: students creating podcasts for an international audience.

Teachers should aim for the upper levels, where learning becomes more interactive, authentic, and learner-centered.

- **ESL Classroom Example: Applying the SAMR Model in a B1 English Class**
  Level: B1 (Intermediate)
  Objective: Improve writing, collaboration, and digital literacy using technology while understanding the impact of different levels of integration.

1. Substitution

- **Definition:** Technology directly replaces a traditional tool with minimal functional change.
- **Example Activity:** Students type a short descriptive paragraph about their daily routine instead of writing it by hand.
- **Benefit:** Maintains the same learning goal but introduces digital familiarity and faster editing.

2. Augmentation

- **Definition:** Technology replaces a traditional tool but adds functional improvements.
- **Example Activity:** Students use grammar-checking software (e.g., Grammarly) while writing a paragraph about their weekend.
- **Benefit:** Provides immediate feedback on grammar and vocabulary, supporting self-correction and accuracy.

3. Modification

- **Definition:** Technology redesigns the task, allowing new learning opportunities.
- **Example Activity:** Students collaborate on a Google Doc to write a group story, adding images, hyperlinks, and comments.

- **Benefit:** Encourages peer interaction, teamwork, and digital communication skills.

4. Redefinition

- **Definition:** Technology allows students to perform tasks that would be impossible without it.
- **Example Activity:** Students create a podcast about cultural festivals in their country and share it with an international audience via a blog or social media platform.
- **Benefit:** Promotes authentic communication, global collaboration, creativity, and digital literacy beyond the classroom.

Integration in the Lesson

- Teacher introduces the SAMR framework and explains each level with examples.
- Students first complete a substitution task individually, then progress to augmentation and modification tasks in pairs or groups.
- For redefinition, students produce a podcast project, incorporating research, scripting, recording, and editing.
- Teacher monitors progress, provides feedback on language use, and encourages reflection on how technology changes the learning experience.

Learning Outcomes

- Improved writing and editing skills
- Enhanced collaboration and communication using digital tools
- Increased understanding of how technology transforms learning tasks
- Development of digital literacy, creativity, and authentic communication

3.4.2. Universal Design for Learning (UDL)

Universal Design for Learning (UDL) is an educational framework that ensures all learners, including those with disabilities or diverse linguistic and cultural backgrounds, can access and engage with instruction (CAST, 2018). UDL

emphasizes providing multiple means of representation, expression, and engagement, allowing learners to receive information in varied formats, demonstrate understanding through different modalities, and remain motivated through personalized learning options. By integrating flexible materials, adaptive technologies, and inclusive strategies, UDL reduces barriers to learning, fosters equity, and supports diverse learner needs, ensuring that technology and instructional design benefit every student.

It is based on three principles:

- Multiple means of engagement → offering options that sustain interest (games, visuals, videos).
- Multiple means of representation → presenting content in varied formats (audio, text, images).
- Multiple means of action and expression → allowing different modes of output (videos, slides, online discussions).

Technology facilitates UDL by lowering barriers and offering flexible pathways to learning (Rao & Meo, 2016).

3.4.3 Managing Challenges

Despite its many benefits, technology integration in education also presents challenges that require careful planning and proactive management. Common issues include limited access to devices or reliable internet, varying levels of digital literacy among teachers and students, and potential distractions or misuse of technology. Technical difficulties, software compatibility, and maintenance demands can disrupt learning if not anticipated. Additionally, overreliance on technology may overshadow pedagogical goals or reduce opportunities for hands-on, interpersonal learning. Effective management involves providing professional development, establishing clear guidelines, ensuring equitable access, and thoughtfully selecting tools that align with instructional objectives, so that technology enhances rather than hinders learning outcomes.

3.4.4 Digital Distractions

Digital distractions occur when students divert attention to unrelated apps, websites, or notifications during learning activities. To minimize this, teachers can set clear expectations for technology use, design structured and engaging tasks that maintain focus, and utilize monitoring or classroom management tools to track activity. Additionally, incorporating interactive, goal-oriented digital activities and frequent check-ins helps sustain attention, ensuring that technology supports learning rather than undermining it.

Digital Equity

Not all learners have equal access to devices or stable internet. Teachers can:

- Provide offline options
- Design mobile-friendly tasks
- Use universally accessible platforms

- **ESL Classroom Example: Managing Digital Distractions in a B1 English Class**

  Level: B1 (Intermediate)

  Objective: Promote focused learning and effective use of technology while reducing off-task behavior during digital activities.

1. Context

- Students are using tablets or laptops in a blended learning environment.
- Activities include online reading, vocabulary exercises, and interactive grammar games.
- Some students tend to switch to social media, messaging apps, or unrelated websites during tasks.

2. Classroom Strategies

- **Clear Expectations:**
  - ✓ Teacher explains acceptable use of devices and sets goals for each activity.

- ✓ Example: "During the 20-minute reading task, please only use the reading platform and vocabulary app."

- **Engaging, Structured Tasks:**
  - ✓ Activities are designed to be interactive, time-bound, and gamified.
  - ✓ Example: Vocabulary quiz with immediate feedback and class leaderboard.
- **Monitoring Tools:**
  - ✓ Teacher uses learning platform analytics to track student activity and participation.
  - ✓ Optional classroom management apps (e.g., ClassDojo or GoGuardian) alert the teacher if students stray from tasks.
- **Frequent Check-Ins:**
  - ✓ Teacher circulates, asks questions, and encourages discussion about progress.
  - ✓ Example: Students summarize what they learned in pairs before continuing the online activity.

3. Integration in the Lesson

1. **Pre-Task (5–10 minutes):**
   - ✓ Teacher explains goals and demonstrates the platform.
   - ✓ Students set personal learning goals and note them in a shared document.
2. **Task (15–20 minutes):**
   - ✓ Students complete reading comprehension exercises and vocabulary games.
   - ✓ Teacher monitors engagement and redirects off-task students.
3. **Post-Task (5–10 minutes):**
   - ✓ Students discuss challenges or distractions they faced.
   - ✓ Teacher encourages reflection and strategies for maintaining focus in future sessions.

4. Learning Outcomes

- ✓ Improved task-focused use of digital tools.
- ✓ Increased learner autonomy and self-regulation.
- ✓ Enhanced vocabulary and reading skills.
- ✓ Reduced off-task behavior, leading to more productive classroom technology use.

3.4.5 Teacher Digital Literacy

Teacher digital literacy is crucial for effective technology integration, as inadequate training can limit the pedagogical impact of digital tools and hinder student learning. Educators need proficiency not only in operating technology but also in applying it strategically to enhance instruction. Ongoing professional development, mentoring, and access to practical resources ensure teachers remain confident, up-to-date, and able to design meaningful, technology-supported learning experiences (Hockly, 2018).

3.4.6 Privacy and Data Security

Privacy and data security are essential considerations when integrating technology in education. Teachers must safeguard student information by using secure, trusted platforms, minimizing the collection of unnecessary personal data, and adhering to institutional and legal policies regarding data protection. Implementing strong passwords, encryption, and access controls, as well as educating students about responsible digital practices, helps maintain confidentiality and trust while ensuring that technology use remains safe and compliant.

- **Case Study1: Integration Strategy for B1 English Learners**

Context:

A B1 English course at a language institute, combining in-person and online learning for 20 students. Learners have basic digital literacy and access to mobile devices or computers.

1. Blended Learning Approach

- **Face-to-Face Sessions:**
  - ✓ Focus on discussions, role-plays, and oral practice.
  - ✓ Teacher facilitates speaking activities, pronunciation drills, and interactive games.
  - ✓ Immediate feedback and peer interaction strengthen communicative competence.
- **Online Sessions:**
  - ✓ Students watch instructional videos, TED-Ed talks, and YouTube interviews to enhance listening skills.
  - ✓ Podcasts and audio exercises support pronunciation and fluency.
  - ✓ Learners create digital visuals such as infographics or slides summarizing grammar rules, vocabulary, or reading content.

Outcome: Students benefit from a dynamic mix of synchronous, interactive learning and asynchronous, self-paced activities.

2. Autonomy and Feedback

- **Access Anytime:**
  - ✓ LMS provides materials, recordings, and exercises accessible 24/7.
  - ✓ Students can review lessons, practice at their own pace, and repeat exercises as needed.
- **Personalized Feedback:**
  - ✓ Teachers track student progress via LMS analytics.
  - ✓ Feedback is provided on quizzes, oral recordings, and digital projects.
  - ✓ Learners can identify strengths and areas for improvement, promoting self-directed learning.

Outcome: Learners develop autonomy, self-regulation, and confidence in using English outside the classroom.

3. Assessment Strategy

- **Digital Portfolios:**
  - ✓ Students submit recordings, infographics, slide presentations, or short videos demonstrating comprehension and language production.
  - ✓ Portfolios showcase progress over time and allow teachers to assess multiple skills simultaneously.
- **Quizzes:**
  - ✓ Online quizzes test vocabulary, grammar, listening comprehension, and reading skills.
  - ✓ Automated scoring provides immediate feedback to learners.

Outcome: Assessment becomes multimodal, authentic, and reflective of real-world language use, encouraging creativity and sustained effort.

4. Role of Multimedia Tools

- **Video Tools:** Improve comprehension, model pronunciation, and expose students to authentic accents and contexts.
- **Audio Tools:** Podcasts, text-to-speech, and recording apps strengthen listening skills, pronunciation, and speaking confidence.
- **Visual Tools:** Infographics, digital posters, and slides facilitate vocabulary acquisition, grammar visualization, and creative expression.

Integrated Outcome:

- Learners engage in **interactive, multimodal experiences** that enhance comprehension, production, pronunciation, and creativity.
- Digital tools promote **autonomy, collaboration, and digital literacy**, preparing students for real-world communication and lifelong learning.

Case Study2: Collaborative Storytelling with Digital Tools (B1 English Learners)

Context:

A B1-level English class at a language school with 18 students, using blended

learning (face-to-face + online). Students have basic digital literacy and access to tablets or laptops.

1. Activity Overview: Collaborative Digital Storytelling

Objective: Develop writing, speaking, reading, and creative skills by co-creating stories using digital platforms.

Face-to-Face Component:

- ✓ Students brainstorm story ideas in groups.
- ✓ Teacher facilitates discussion, guides plot development, and models sentence structures.
- ✓ Peer feedback is given during story drafting and oral storytelling practice.

Online Component:

- ✓ Students use a shared platform (Google Docs, Padlet, or StoryJumper) to write and illustrate their stories collaboratively.
- ✓ Multimedia elements such as images, audio narrations, or short video clips are added to enrich the story.
- ✓ Teacher tracks contributions, provides inline comments, and offers corrective feedback.

Outcome: Students practice language in authentic, creative contexts while combining writing, speaking, and reading skills.

2. Autonomy and Feedback

Access Anytime:

- ✓ Students can edit their stories at any time, review peers' contributions, and integrate multimedia elements independently.

Personalized Feedback:

- ✓ Teacher monitors each student's input via platform analytics.
- ✓ Feedback is given on grammar, vocabulary, storytelling coherence, and pronunciation for audio narrations.

Outcome: Students develop self-directed learning skills, responsibility, and confidence in digital collaboration.

3. Assessment Strategy

Digital Portfolios:

- ✓ Completed stories with text, images, and audio/video narrations are collected in a shared portfolio.
- ✓ Portfolios demonstrate writing, reading, speaking, and creative competence over time.

Peer Evaluation:

- ✓ Students review other groups' stories, provide constructive comments, and suggest vocabulary improvements.

Outcome: Assessment is authentic, multimodal, and encourages reflection and collaborative skills.

4. Role of Multimedia Tools

- ✓ **Text Tools:** Collaborative documents support writing practice and peer review.
- ✓ **Audio Tools:** Students record narrations to practice pronunciation and fluency.
- ✓ **Visual Tools:** Images, slides, and illustrations enhance creativity and comprehension.
- ✓ **Interactive Platforms:** Shared storyboards or online boards allow real-time collaboration and editing.

Integrated Outcome:

- ✓ Learners improve integrated language skills in a creative, collaborative environment.
- ✓ Digital tools foster autonomy, engagement, and digital literacy, while making language learning meaningful and authentic.

3.5 Best Practices for Integrating Technology

Best practices for integrating technology in education involve intentional, thoughtful strategies that enhance learning while addressing potential challenges. Key approaches include aligning digital tools with clear learning objectives, selecting platforms that support diverse learner needs, and

designing interactive, student-centered activities. Teachers should provide guidance and scaffolding, foster digital literacy, and encourage responsible, ethical technology use. Ongoing assessment and feedback help monitor effectiveness, while professional development ensures educators stay proficient with evolving tools. Additionally, maintaining equitable access, protecting privacy, and minimizing distractions are essential to creating a safe, inclusive, and engaging digital learning environment.

3.5.1. Start with Pedagogy, Not Tools

Effective integration begins with identifying outcomes:

- What should students learn?
- How can technology support these objectives?

Pedagogical alignment prevents "technology for technology's sake."

3.5.2. Use Technology to Promote Communication

Technology should enhance, not replace, interaction. Useful platforms include:

- Breakout rooms for speaking practice
- Collaborative documents for writing
- Discussion boards for asynchronous dialogue
- Voice notes for pronunciation practice

Research shows that meaningful communication accelerates acquisition (Gass & Mackey, 2015).

3.5.3. Choose Simple, Accessible Tools

To ensure inclusivity:

- Prioritize free or low-cost apps
- Choose mobile-friendly platforms
- Avoid complex logins
- Provide clear instructions

Simplicity increases participation and reduces cognitive load.

3.5.4. Combine Traditional and Digital Approaches

Combining traditional and digital approaches creates a balanced learning environment where technology enhances rather than replaces effective face-to-face instruction. Classic activities such as debates, dictations, reading circles, or dramatizations can be enriched with digital follow-ups, including online discussions, multimedia presentations, or interactive quizzes. This integration leverages the strengths of both methods—maintaining personal interaction and hands-on experiences while providing access to digital resources, immediate feedback, and extended practice—resulting in more engaging, flexible, and effective learning experiences.

Case Study1: Best Practices for Technology Integration in B1 English

Context:

A B1 English course at a university language center, with 25 learners, blending in-person and online learning. Students have basic digital literacy and access to tablets or laptops.

1. Intentional Alignment with Learning Objectives

- **Strategy:** Teachers select digital tools that directly support course goals (e.g., improving listening comprehension, oral fluency, vocabulary, and grammar).
- **Example:**
  - ✓ Listening objectives → Podcasts or authentic YouTube interviews.
  - ✓ Vocabulary expansion → Interactive flashcards (Anki, Quizlet).
  - ✓ Speaking practice → Voice recording apps or speech-recognition software.

Outcome: Technology enhances learning instead of distracting, ensuring each tool serves a pedagogical purpose.

2. Interactive, Student-Centered Activities

- **Strategy:** Learners actively engage with multimedia, create digital content, and collaborate online.
- **Example:**
  - ✓ Group projects using Google Docs for collaborative writing.
  - ✓ Infographics summarizing reading texts.
  - ✓ Video role-plays submitted via LMS.

Outcome: Students become co-creators of knowledge, improving engagement, autonomy, and language production.

3. Scaffolding and Guidance

- **Strategy:** Teachers provide structured support to help learners navigate technology effectively.
- **Example:**
  - ✓ Step-by-step instructions for using online dictionaries, pronunciation tools, or LMS platforms.
  - ✓ Tutorials on creating digital portfolios or recording speaking assignments.

Outcome: Reduces frustration and ensures that technology serves learning rather than becoming a barrier.

4. Promoting Digital Literacy and Ethical Use

- **Strategy:** Learners develop skills in evaluating online content, responsible communication, and safe technology use.
- **Example:**
  - ✓ Classroom discussions on credibility of online sources.
  - ✓ Guidelines for respectful online collaboration and privacy protection.

Outcome: Students improve digital literacy while developing skills relevant to academic and professional contexts.

5. Continuous Assessment and Feedback

- **Strategy:** Teachers use digital tools to monitor progress and provide timely feedback.
- **Example:**
  - ✓ LMS analytics to track quiz performance and participation.
  - ✓ Personalized comments on recorded oral tasks.
  - ✓ Peer feedback on collaborative projects using online platforms.

Outcome: Students receive actionable feedback, supporting ongoing improvement and self-directed learning.

6. Professional Development and Teacher Preparedness

- **Strategy:** Educators participate in training to stay updated on emerging tools and pedagogical approaches.
- **Example:** Workshops on integrating AI chatbots for oral practice or VR simulations for immersive learning.

Outcome: Teachers confidently select and implement effective tools, enhancing the quality of instruction.

7. Equity, Privacy, and Minimizing Distractions

- **Strategy:** Ensure all learners have access to devices and reliable internet; protect student data; design engaging activities to maintain focus.
- **Example:**
  - ✓ Provide offline alternatives for students with limited connectivity.
  - ✓ Use secure platforms for assignments and feedback.
  - ✓ Incorporate interactive polls and gamified tasks to maintain attention.

Outcome: Creates a safe, inclusive, and engaging learning environment for all students.

Integrated Outcome:

By applying these best practices, B1 learners experience **interactive, personalized, and safe technology-enhanced learning**, strengthening language skills, digital literacy, and learner autonomy while fostering equity and ethical technology use.

- **Case Study2: Gamification and Mobile Learning for B1 English Students**

Context:

A B1 English course at a private language institute with 20 students. The program combines face-to-face sessions with mobile-assisted learning (MALL). Students have basic digital literacy and access to smartphones or tablets.

1. Intentional Alignment with Learning Objectives

Strategy: Teachers select mobile apps and gamified platforms that directly support course goals (vocabulary, grammar, listening, and speaking skills).

Examples:

- ✓ Vocabulary → Quizlet or Memrise gamified exercises.
- ✓ Listening → Interactive podcasts with comprehension quizzes.
- ✓ Speaking → Voice recording apps for role-play dialogues.

Outcome: Technology serves the lesson purpose, improving language acquisition while keeping engagement high.

2. Interactive, Student-Centered Activities

Strategy: Learners actively participate in gamified challenges and collaborative mobile tasks.

Examples:

- ✓ Weekly vocabulary tournaments via Kahoot! or Quizizz.
- ✓ Collaborative storytelling using mobile apps like Padlet or Storybird.
- ✓ Short video role-plays submitted through the LMS for peer review.

Outcome: Students become active creators of content, enhancing autonomy, motivation, and language output.

3. Scaffolding and Guidance

Strategy: Teachers provide structured support to ensure students navigate mobile apps effectively.

Examples:

- Step-by-step instructions for game-based quizzes or recording apps.
- Tutorials for creating audio narratives or digital flashcards.

Outcome: Learners experience less frustration and remain focused on language learning goals.

4. Promoting Digital Literacy and Ethical Use

Strategy: Learners develop skills in evaluating content, communicating responsibly, and using technology safely.

Examples:

- ✓ Discussing credible sources in online reading activities.
- ✓ Guidelines for respectful peer interaction in collaborative apps.

Outcome: Students strengthen digital literacy alongside language skills.

5. Continuous Assessment and Feedback

Strategy: Teachers use mobile analytics and app features to track progress and provide feedback.

Examples:

- ✓ Instant quiz results for vocabulary and grammar tasks.
- ✓ Peer feedback on recorded dialogues via app sharing.
- ✓ Personalized comments on gamified challenges.

Outcome: Learners receive timely, actionable feedback supporting self-directed improvement.

6. Engagement, Motivation, and Equity

Strategy: Gamified and interactive tasks maintain motivation and ensure inclusivity.

Examples:

- Badges, points, or leaderboards for task completion.
- Offline alternatives or low-data options for students with limited connectivity.

Outcome: Creates an inclusive, motivating, and equitable learning environment.

Integrated Outcome:

By applying gamification and mobile learning best practices, B1 learners experience interactive, personalized, and motivating language activities. Students develop vocabulary, speaking, listening, and digital literacy skills, strengthen autonomy, and enjoy a safe, engaging, and equitable learning environment.

3.6. Classroom Scenarios: Technology in Action

Classroom scenarios showcasing technology in action illustrate how digital tools can enhance engagement, collaboration, and learning outcomes. For example, a language class might use interactive whiteboards to map vocabulary visually, followed by students practicing pronunciation through speech-to-text software and recording their responses for self-assessment. In a science lesson, tablets or simulation software can allow students to conduct virtual experiments, while online quizzes provide immediate feedback. Collaborative platforms like Google Classroom or Microsoft Teams enable group projects, peer review, and resource sharing beyond the physical classroom. By thoughtfully integrating hardware, multimedia, and digital platforms, these scenarios demonstrate how technology can support active learning, personalized instruction, and real-world skill development.

3.6.1. **Scenario A:** A2 Level – Moderate Technology Integration

Topic: Daily routines and frequency adverbs

Tools: YouTube + Google Forms

1. Students watch a YouTube clip of a person's daily routine.

2. They complete a Google Forms quiz.
3. In groups, they create a short routine using online images.

Outcome:

Vocabulary reinforcement, guided writing, and improved listening comprehension.

3.6.2. <u>Scenario B:</u> B1 Level – Full Digital Integration

Topic: Comparing cultures

Tools: Padlet + Canva + Zoom

1. Students explore a Padlet containing videos, articles, and infographics.
2. In breakout rooms, they discuss cultural differences.
3. Groups create a Canva infographic.
4. They present it to the class.

Outcome:

Authentic communication, multimodal production, and collaborative skills.

3.6.3 <u>Scenario C</u>: Vocabulary and Pronunciation Practice

Tools Used: Interactive Whiteboards (IWBs), Speech-to-Text software, Recording apps

Activity Flow:

1. Teacher introduces a new vocabulary set on an IWB, using images, audio, and video to contextualize meaning.
2. Students practice pronunciation individually using speech-to-text software, which converts their speech to text for immediate accuracy feedback.
3. Learners record their responses and review them to self-assess pronunciation, stress, and intonation patterns.

Learning Outcomes:

- ✓ Improved vocabulary retention through multimodal presentation.
- ✓ Enhanced speaking skills and self-monitoring of pronunciation.

- ✓ Increased student engagement through interactive, technology-supported activities.

3.6.4 Scenario D: Listening Comprehension and Cultural Exposure

Tools Used: Podcasts, YouTube videos, Online Quizzes

Activity Flow:

1. Students listen to an authentic podcast or watch a short YouTube interview in English.
2. Teacher prepares comprehension questions via an online quiz platform (e.g., Kahoot, Quizlet) to test understanding of key ideas, vocabulary, and idiomatic expressions.
3. Students submit answers in real time, receiving instant feedback and explanations.

Learning Outcomes:

- ✓ Development of listening comprehension skills in realistic contexts.
- ✓ Exposure to natural speech patterns, accents, and cultural references.
- ✓ Immediate feedback encourages reflection and correction.

3.6.5 Scenario E: Collaborative Writing and Peer Feedback

Tools Used: Google Docs, LMS discussion forums

Activity Flow:

1. Students collaboratively write a short story or dialogue using Google Docs.
2. Peers provide comments and suggestions directly in the shared document.
3. Teacher monitors progress, adds feedback, and highlights language use, grammar, and cohesion.

Learning Outcomes:

- ✓ Development of writing and editing skills in a collaborative environment.
- ✓ Enhanced critical thinking and peer-assessment skills.

- ✓ Familiarity with digital platforms and collaborative tools.

3.6.6 Scenario F: Speaking and Role-Play

Tools Used: Video recording apps, Mobile devices, VR simulations (optional)

Activity Flow:

1. Students prepare role-plays based on real-life scenarios (e.g., ordering food, booking a hotel).
2. They record their performance using mobile devices or participate in VR simulations for immersive practice.
3. Teacher and peers provide constructive feedback on language accuracy, fluency, and non-verbal communication.

Learning Outcomes:

- ✓ Increased speaking confidence and communicative competence.
- ✓ Contextualized language use through simulation of real-life interactions.
- ✓ Practice in self-assessment and reflection using digital tools.

3.6.7 Scenario G: Reading Comprehension and Visual Analysis

Tools Used: Digital posters, Infographic makers, Presentation software

Activity Flow:

1. Teacher assigns a short article or blog post in English.
2. Students summarize key ideas and create a visual representation (infographic or digital poster).
3. Learners present their visual summaries to the class, integrating text, images, and diagrams.

Learning Outcomes:

- ✓ Enhanced reading comprehension and synthesis skills.
- ✓ Multimodal representation of knowledge promotes retention and creativity.
- ✓ Practice of presentation and digital literacy skills.

Key Takeaways from Technology-Enhanced Scenarios

- **Engagement:** Interactive tools capture attention and make learning more enjoyable.
- **Collaboration:** Digital platforms foster teamwork, peer feedback, and resource sharing.
- **Autonomy:** Students practice independently, review recordings, and manage learning pace.
- **Authenticity:** Exposure to real-world materials and simulations develops practical language skills.
- **Feedback:** Immediate and personalized feedback supports continuous improvement.

3.7. Emerging Trends in Technology for ESL/EFL

Emerging trends in technology for ESL/EFL highlight the increasing role of AI, immersive environments, and multimodal tools in language learning. AI-powered applications provide personalized learning paths, automated feedback, and on-demand speaking practice, while speech-recognition software helps refine pronunciation and fluency. Virtual and augmented reality create realistic, interactive scenarios for practicing communication in context, and multimodal platforms integrate text, audio, video, and images to develop all language skills holistically. These technologies also support learner autonomy, enabling practice outside the classroom, and promote inclusive, differentiated instruction to meet diverse learner needs. Together, these trends enhance engagement, offer real-world relevance, and expand opportunities for flexible, personalized, and effective language learning.

3.7.1. Artificial Intelligence (AI)

AI tools such as ChatGPT, Grammarly, and automated speech recognition provide personalized, instant feedback. They support drafting, pronunciation analysis, and content generation (Godwin-Jones, 2023).

3.7.2. Virtual and Augmented Reality

VR simulations allow immersive experiences—visiting an airport, attending a lecture, or participating in a job interview. AR apps overlay digital content on real environments, enriching vocabulary and situational learning.

3.7.3. Mobile-Assisted Language Learning (MALL)

MALL emphasizes convenience and continuity, allowing blended and micro-learning approaches (Burston, 2015).

3.7.4. Learning Analytics

Data from LMS and digital apps help teachers identify struggling learners, measure progress, and tailor instruction.

Nowadays, technology is very important for learning English. **Artificial Intelligence (AI)** tools like ChatGPT or Grammarly can help students write texts and check mistakes quickly. Some apps can also help with **pronunciation**.

Virtual Reality (VR) allows students to practice English in real situations. For example, they can visit an airport or attend a lecture in a virtual world. Augmented Reality (AR) can show new words on objects in the real world, so students learn vocabulary in context.

Mobile-Assisted Language Learning (MALL) lets students learn anytime and anywhere. They can use their phones for short lessons or practice English during free time.

Finally, learning analytics help teachers see which students need more help and plan lessons for them.

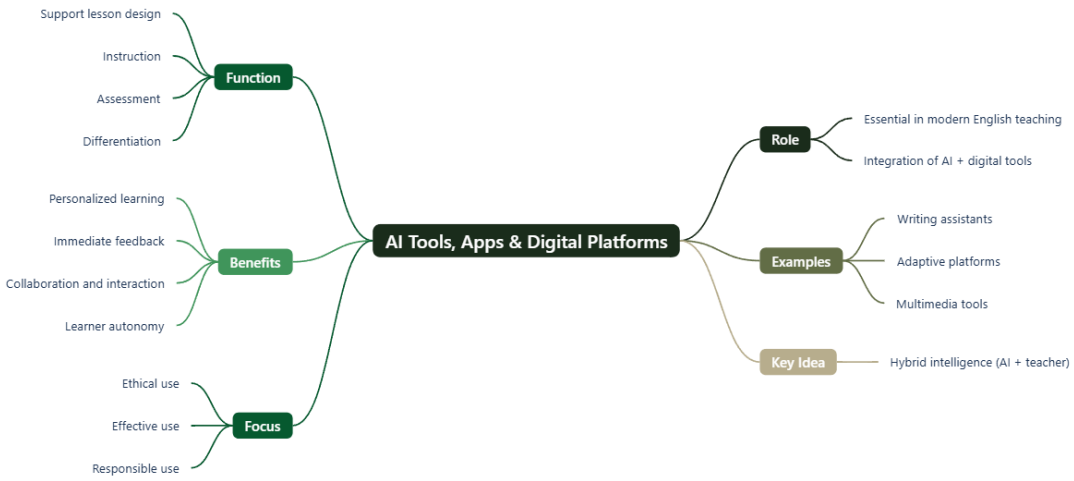
Technology is an indispensable component of contemporary English language teaching. When used strategically—aligned with learning objectives, grounded in pedagogical theory, and inclusive of diverse learners—digital tools can transform instruction. They enhance motivation, provide access to authentic resources, support learner autonomy, and foster essential digital literacies.

This chapter has established the theoretical and practical foundations for subsequent chapters, which will examine AI tools, flipped classroom models, and interactive digital materials in greater depth.

CHAPTER 4

4. AI Tools, Apps, and Digital Platforms for English Teachers

Figure 18. AI Tools, Apps, and Digital Platforms for English Teachers



Source: Author's own elaboration.

In today's rapidly evolving educational landscape, English teachers are navigating a world where digital innovation is not merely an enhancement but a fundamental component of effective pedagogy. The integration of artificial intelligence (AI), mobile applications, and interactive online platforms has transformed how teachers design lessons, deliver instruction, assess language proficiency, and support learners with diverse needs. As outlined by Luckin et al. (2016), the fusion of AI and human pedagogy results in a "hybrid intelligence" that enhances both teaching and learning experiences.

AI-powered writing assistants, adaptive reading platforms, automated assessment systems, and creative multimedia tools now form part of the modern English classroom ecosystem. These tools not only streamline administrative and instructional tasks but also facilitate differentiated learning—allowing teachers to individualize content according to proficiency levels, interests, and goals (Holmes et al., 2022). At the same time, collaborative digital environments expand the classroom beyond physical boundaries and

encourage active learning, peer interaction, and autonomous language practice (Godwin-Jones, 2023).

The aim of this chapter is to present an expanded, research-informed overview of AI tools, apps, and digital platforms relevant to English language teaching (ELT). It also seeks to empower educators to integrate these technologies critically, ethically, and pedagogically so that they enhance learning while safeguarding student well-being, privacy, and academic integrity.

4.1. Understanding Artificial Intelligence in Language Teaching

Artificial Intelligence (AI) is transforming language teaching by providing tools and methods that enhance learning, assessment, and personalized instruction. In language education, AI goes beyond traditional computer-assisted methods by enabling dynamic interaction, real-time feedback, and adaptive learning experiences.

At its core, AI in language teaching involves systems that can process, analyze, and generate human language. These systems use technologies such as natural language processing (NLP), machine learning, and speech recognition to understand learners' input, evaluate performance, and provide appropriate guidance. For example, AI can automatically correct grammar and pronunciation, generate personalized exercises, or even simulate conversational partners for practice in speaking and listening skills.

One of the key advantages of AI in language teaching is its ability to personalize learning. Each student may have different levels of proficiency, strengths, and areas for improvement. AI can analyze learners' interactions, identify mistakes or patterns, and adapt exercises accordingly. This ensures that each student receives the right level of challenge and support, promoting faster and more effective language acquisition.

Additionally, AI supports formative assessment and feedback, which are critical in language learning. Rather than waiting for a teacher to review work manually, learners can receive instant, data-driven feedback on writing,

pronunciation, vocabulary use, and comprehension. This immediate guidance helps reinforce learning and encourages self-directed improvement.

However, it is important to recognize that AI is a complementary tool, not a replacement for human educators. Teachers provide essential guidance, cultural context, motivation, and critical thinking skills that AI cannot replicate. When integrated thoughtfully, AI in language teaching enhances engagement, efficiency, and personalized support, creating richer, more effective learning experiences for students.

4.2 What Artificial Intelligence Is

Artificial Intelligence (AI) encompasses computational systems capable of performing tasks that typically require human intelligence, including reasoning, decision-making, language understanding, and pattern recognition (Russell & Norvig, 2020). In education, AI systems analyze large datasets and apply algorithmic models to generate predictions, recommendations, or content. Of particular relevance to English teaching is Generative AI, which creates original text, images, audio, or video based on learned linguistic patterns.

In ELT, AI can function in multiple pedagogical roles:

- **AI as a tutor:** Simulating one-on-one grammar explanations, conversation practice, or pronunciation support (Heil et al., 2020).
- **AI as a writing assistant:** Detecting errors, suggesting vocabulary, and improving coherence (Bai & Park, 2022).
- **AI as an instructional designer**: Generating tasks, lesson plans, and customized learning materials.
- **AI as a classroom assistant:** Providing formative assessment, grading support, and analytics.
- **AI as a creativity amplifier:** Creating images, dialogues, videos, or interactive content for language tasks.

Although sophisticated, AI cannot replace teachers, whose roles include emotional support, contextual judgement, cultural mediation, creativity, and

relationship-building (Holmes et al., 2022). Rather, AI extends teacher capability by handling repetitive tasks, generating instructional materials, and offering individualized feedback at scale. With these supports, teachers can devote more time to higher-order pedagogical decision-making, observation, and meaningful student interaction.

4.3 Ethical and Safe Use in Education

As technology, especially AI, becomes more common in education, it is important to use it ethically and safely. Teachers and students must think about data privacy—personal information should be protected and not shared without permission. Another important issue is algorithmic fairness, which means AI tools should be fair and not favor some students over others.

Academic integrity is also essential. Students should use AI to help them learn, not to cheat or copy answers. Schools and teachers can guide students to use AI responsibly. Finally, using AI in education can help students develop digital citizenship, learning how to behave safely, respectfully, and responsibly online. Following these ethical principles ensures that technology supports learning without causing harm (Williamson & Eynon, 2020).

4.4 Privacy and Data Protection

Because many AI tools require user input and store data, English teachers and institutions must prioritize:

- the use of platforms compliant with GDPR, FERPA, or equivalent privacy frameworks
- avoiding unnecessary collection of personally identifiable information (PII)
- transparency with learners regarding how AI tools function and how data is handled
- usage of anonymized, pseudonymized, or school-issued accounts

Failure to safeguard privacy can lead to surveillance risks, data breaches, or misuse of learner information (Regan & Jesse, 2019).

4.5 Avoiding Algorithmic Bias

AI systems often reflect biases present in the data used to train them. In language learning applications, these biases can appear in several ways. For example, AI may privilege certain English dialects, making some learners feel less represented or understood. It may also reinforce stereotypes in the content it generates, or show unequal accuracy when recognizing learners' speech, especially for those with different accents (Koenecke et al., 2020).

To address these challenges, teachers need to critically review AI outputs before using them in class. They should also teach students how to identify biases in digital tools and encourage them to apply human judgment rather than accepting AI suggestions automatically. By being aware of algorithmic bias, educators can ensure that AI supports fair, inclusive, and effective language learning.

Avoiding Bias in AI Language Tools

Some AI tools for learning English can make mistakes because of bias. For example, they may understand some English accents better than others, or show content that favors certain cultures.

A teacher can help students use these tools safely. Students can check the suggestions from AI and think for themselves instead of always trusting it. This helps all learners have a fair and useful learning experience.

4.6 Ensuring Academic Integrity

As AI-generated text becomes more sophisticated, concerns about plagiarism and outsourcing of assignments have increased. Instead of banning AI entirely, educators can design assessments that encourage genuine student engagement and critical thinking. For example, teachers can require students to:

- Keep metacognitive journals that explain how AI tools were used in completing tasks.

- Participate in oral defenses of their written work to demonstrate understanding.
- Produce reflective writing on their learning process and choices.
- Complete personalized creative tasks that are difficult to outsource to AI.

These strategies help students use AI responsibly while maintaining academic integrity. Contemporary research emphasizes the importance of fostering AI literacy—teaching students how to use AI thoughtfully—rather than prohibiting AI outright (Holmes et al., 2022). By integrating AI in a structured and reflective way, educators can enhance learning while preserving fairness and originality.

Using AI Responsibly in English Class

AI tools can help students write essays, but sometimes students might copy text without thinking. Teachers can help students use AI in a safe and fair way. For example, students can:

- Write a short journal explaining how they used AI.
- Talk about their essay in class (oral defense) to show they understand it.
- Do reflective writing about what they learned.
- Create original tasks like personal stories or projects that AI cannot easily do.

Using AI this way helps students learn better and keeps their work honest and fair.

4.7 Educating Students About Responsible AI Use

Educating students about responsible AI use involves teaching them how to interact with artificial intelligence ethically, safely, and critically. This includes understanding AI's capabilities and limitations, recognizing biases in AI outputs, and verifying information generated by AI tools. Students should learn to use AI as a supportive resource for learning, creativity, and problem-solving while maintaining academic integrity and privacy. Integrating lessons on digital citizenship, data protection, and ethical decision-making helps learners

develop critical thinking and responsible behavior, ensuring that AI enhances their education without fostering dependency or misuse.

Responsible AI use includes:

- Verifying accuracy of AI-generated information
- Distinguishing between acceptable assistance and dishonest outsourcing
- Citing or acknowledging AI contributions (MLA, APA, and IEEE now offer AI citation guidance)
- Understanding limitations, such as hallucinations or incomplete reasoning

Developing AI literacy is considered an essential component of modern digital competence (Zawacki-Richter et al., 2019).

4.8 AI Tools for Teachers

AI tools offer teachers unprecedented support by automating labor-intensive tasks, generating instructional materials, and helping personalize instruction for diverse learners. These tools can assist in creating lesson plans, quizzes, assignments, and interactive learning activities, significantly reducing preparation time and allowing educators to focus on student engagement and individualized support. Beyond content generation, AI can analyze student performance data to identify learning gaps, suggest targeted interventions, and adapt activities to different skill levels, promoting more effective and inclusive teaching. Additionally, AI can streamline administrative responsibilities such as grading, attendance tracking, and reporting, freeing up time for teachers to concentrate on fostering critical thinking, creativity, and collaboration in the classroom. By integrating AI thoughtfully, educators can enhance both the efficiency and quality of instruction while maintaining control over pedagogical decisions.

4.9 AI for Activity Generation

Artificial Intelligence (AI) is increasingly being used to support teachers, trainers, and instructional designers in creating engaging and pedagogically sound learning activities. Traditional activity design often requires significant time, creativity, and expertise; AI tools help streamline this process by generating ideas, materials, and structures that can be quickly adapted to different learners and contexts.

AI-powered activity generation systems can analyse learning objectives, curriculum standards, student performance data, and preferred teaching strategies to propose suitable exercises—ranging from quizzes and writing prompts to interactive simulations and collaborative tasks. These systems rely on natural language processing, machine learning models, and content-creation algorithms to produce activities that are aligned with specific educational goals.

The use of AI does not replace the educator's role; instead, it enhances their capacity by reducing preparation time and offering a broader range of activity options. Teachers remain responsible for evaluating the appropriateness, accuracy, and inclusiveness of AI-generated materials. When used effectively, AI can support differentiated instruction, personalized learning paths, and innovative classroom practices.

Overall, AI for activity generation represents a powerful tool for improving efficiency and creativity in educational design, ultimately helping educators deliver more engaging and meaningful learning experiences.

4.10 Using AI to Create Activities in English Class

Teachers can use AI to help make learning activities faster and easier. For example, an AI tool can suggest quizzes, writing prompts, or group tasks for students. The AI can look at the lesson goals, students' needs, and what kind of practice is useful.

Even though AI helps create activities, the teacher is still in charge. Teachers check if the activities are correct, fair, and suitable for all students. AI can also

help make different tasks for different students or give extra practice for students who need it.

Using AI this way saves preparation time and gives teachers new ideas. It can make lessons more interesting, fun, and helpful for students.

4.10.1 ChatGPT and Similar Generative AI Tools

ChatGPT and similar generative AI tools are advanced language models that can produce human-like text, answer questions, summarize content, and assist with creative or academic tasks. In educational contexts, they can support brainstorming, language practice, writing assistance, and personalized feedback, offering learners immediate, interactive guidance. However, effective use requires awareness of their limitations, such as potential inaccuracies, biases, or overreliance, and the importance of maintaining academic integrity. Educators can integrate these tools responsibly by teaching students to critically evaluate AI outputs, use them as supplements rather than replacements for learning, and apply them ethically in research, writing, and problem-solving activities.

Generative AI models allow teachers to produce:

- Grammar and vocabulary activities
- Comprehension questions
- CEFR-aligned reading passages
- Dialogues, role-plays, and debate prompts
- Summaries or simplified texts
- Translations for multilingual learners

Teachers can specify difficulty, context, topics, cultural considerations, or learning outcomes. Research increasingly notes the efficiency and quality of AI-generated pedagogical materials (Kasneci et al., 2023).

4.10.2 Using ChatGPT and AI Tools in English Class

Teachers can use AI tools like ChatGPT to help students learn English. These tools can answer questions, give writing ideas, and make exercises for grammar, vocabulary, or reading. For example, AI can create short dialogues, comprehension questions, or role-play activities for students to practice.

Students can also use AI to get feedback on their writing or practice new words. However, they should not copy everything from AI. Teachers explain that AI can make mistakes, and students must check the information and use it responsibly.

Using AI this way helps teachers save time and gives students interesting and personalized activities, making learning English more fun and effective.

4.10.3 MagicSchool, Eduaide, TeachMateAI

MagicSchool, Eduaide.AI, and TeachMateAI are AI-powered tools designed to support teachers by automating tasks, generating resources, and personalizing instruction. **MagicSchool** offers a comprehensive platform for lesson planning, assessments, worksheets, and student-facing tools, serving as an all-in-one assistant for diverse classroom needs.

Eduaide.AI focuses on quickly creating teaching materials such as quizzes, rubrics, and differentiated exercises, making it particularly useful in multilingual or diverse learning environments.

TeachMateAI emphasizes administrative efficiency, helping educators with scheduling, report writing, resource organization, and other time-consuming tasks. While these tools can save preparation time and enhance instruction, their outputs require careful review by teachers to ensure accuracy, appropriateness, and alignment with learning objectives.

Education-oriented AI platforms provide:

- Lesson plan templates
- Marm-ups and exit tickets
- Bloom's taxonomy–aligned questioning
- Parent communication drafts

- Individualized Education Program (IEP) suggestions

These tools reduce cognitive load by structuring tasks using evidence-based pedagogical design (Wang & Vogel, 2023).

4.11 AI Tools for Teachers

Teachers can use AI tools like MagicSchool, Eduaide.AI, and TeachMateAI to help with their work. These tools can create lesson plans, worksheets, quizzes, and reports, and even suggest activities for students with different learning needs.

For example:

- MagicSchool can make lesson plans and student activities.
- Eduaide.AI can quickly create quizzes or exercises for different students.
- TeachMateAI helps with schedules, reports, and organizing resources.

Teachers still need to check the AI outputs to make sure everything is correct and suitable for the students. Using these tools saves time and gives teachers more ideas, helping students learn better.

4.12 AI for Multimodal Content

"Multimodal content" refers to information expressed or presented through different media or "modalities" – for example: text, images, audio, video, or a combination of these.

When we speak of AI for multimodal content, we mean artificial-intelligence systems that can *process*, *understand*, *integrate*, and even *generate* content across those diverse modalities – not just text.

AI can produce:

- Text-to-image visual aids
- AI-generated audio for pronunciation
- Accent variation for listening practice
- Video explanations or animations

Multimodal materials support Universal Design for Learning (UDL) principles by offering multiple means of representation (Meyer, Rose, & Gordon, 2014).

4.13 Using AI for Multimodal Learning

Teachers can use AI to create different types of learning materials for students. This is called multimodal content, which means using text, images, audio, and videos together.

For example, AI can help make:

- **Pictures or diagrams** to explain new words.
- **Audio recordings** to practice pronunciation.
- **Listening exercises** with different accents.
- **Short videos or animations** to show ideas clearly.

Using multimodal materials helps all students understand better because they can learn in different ways, not just by reading or listening.

4.14 Automatic Rubric Design and Feedback Tools

Automatic rubric design and feedback tools are AI-powered systems that assist teachers in creating evaluation rubrics and providing feedback on student work. These tools streamline assessment by generating structured, criteria-based rubrics tailored to specific assignments or learning objectives, reducing the time and effort teachers traditionally spend on designing assessment frameworks.

- **Rubric Generation:** AI can produce detailed rubrics that define performance levels for each criterion, such as "excellent," "proficient," "developing," and "beginner." Teachers can customize these rubrics to match the goals of an assignment or course.
- **Automated Feedback:** These tools can analyze student submissions — including essays, projects, presentations, or code — and provide immediate, actionable feedback based on the rubric criteria. Feedback can highlight strengths, identify areas for improvement, and suggest next steps.

- **Consistency and Objectivity:** By applying the same rubric across multiple students, AI helps maintain consistency and reduce subjective bias in grading.
- **Data Insights:** Many tools provide analytics on class performance, common errors, or patterns of misunderstanding, helping teachers adjust instruction or provide targeted support.

Benefits for educators:

- Saves time in grading and rubric creation.
- Enhances the quality and specificity of feedback.
- Supports formative assessment, enabling students to learn from feedback in real time.
- Promotes fairer and more transparent assessment practices.

Limitations:

- AI feedback may lack nuanced understanding of creativity, context, or originality.
- Teachers must review AI-generated rubrics and feedback to ensure alignment with learning objectives and fairness.
- Over-reliance on automated feedback may reduce personalized teacher-student interactions if not carefully integrated.

4.15 Using AI for Rubrics and Feedback in English Class

Teachers can use AI tools to create rubrics and give feedback on student work. A rubric is a guide that explains how teachers will evaluate assignments, like essays, presentations, or projects. For example, a rubric can show levels such as excellent, proficient, developing, and beginner, with clear descriptions for each level. AI can automatically generate these rubrics and teachers can adjust them to match their lesson goals.

AI tools can also give automatic feedback. They can look at students' writing or projects and suggest improvements. For example, the feedback can highlight good vocabulary**,** point out grammar mistakes**,**

or suggest ways to make the text clearer**.** This helps students understand their strengths and know what to work on next.

Using AI for rubrics and feedback has many benefits: it saves time**,** helps keep grading fair and consistent, and provides teachers with data about class performance, like common mistakes or areas that need more practice.

However, teachers must review the AI outputs**.** AI may not fully understand creative ideas, context, or originality, so human judgment is important. Teachers can use AI as a support tool, combining its suggestions with personal guidance. This way, students can learn faster and more effectively, while teachers can spend more time teaching and supporting students individually**.**

4.16 Rubric Generators

AI can produce detailed rubrics that define performance levels for each criterion, such as "excellent," "proficient," "developing," and "beginner." Teachers can customize these rubrics to match the goals of an assignment or course.

AI-generated rubrics provide criteria for productive skills such as:

- Speaking
- Writing
- Presentations
- Debates

These rubrics can be easily modified for age, level, or learning context.

4.16.1 Using AI to Create Rubrics for English Class

Teachers can use AI to generate rubrics, which are guides that show how students' work will be graded. A rubric explains different levels of performance, for example: excellent, proficient, developing, and beginner. Each level describes what students need to do to reach it, so students know exactly what is expected.

AI rubrics can be used for different language skills, such as:

- **Speaking**: for example, evaluating fluency, pronunciation, or clarity.
- **Writing**: checking grammar, vocabulary, structure, and ideas.
- **Presentations**: including organization, confidence, and use of visual aids.
- **Debates**: judging argument quality, teamwork, and language use.

Teachers can customize AI-generated rubrics to match the age of students, their level, or the type of activity. For instance, a rubric for younger learners may focus on vocabulary and pronunciation, while a rubric for advanced students might include grammar accuracy and argument quality.

Using rubrics helps students understand what is expected and allows them to self-check their work before submitting it. It also helps teachers grade consistently and fairly, especially when there are many students. By combining AI-generated rubrics with teacher guidance, students can improve their skills more effectively and teachers can save time while maintaining quality feedback.

4.17 AI-Assisted Grading

While teachers must remain the final authority, AI tools assist by:

- flagging grammar or vocabulary errors
- identifying coherence issues
- analyzing pronunciation
- offering preliminary scores

Such systems reduce grading time and allow teachers to focus on qualitative feedback (DeVries & Subrahmanian, 2022).

4.18 Feedback Tools for Teachers

Artificial Intelligence (AI) can significantly enhance formative assessment practices by supporting teachers in the generation of individualized, criterion-referenced feedback. Rather than replacing professional judgment, AI functions as a pedagogical assistant that drafts targeted feedback comments

aligned with learning objectives, rubrics, and performance descriptors. Teachers can then review, refine, and contextualize these comments to ensure accuracy, relevance, and appropriateness for each learner.

From a formative assessment perspective (Paul Black & Dylan Wiliam), effective feedback should clarify:

1. Where the learner is going (learning goals),
2. Where the learner currently is (current performance), and
3. How to close the gap (actionable next steps).

AI tools can assist in each of these stages by:

- Aligning comments with CEFR descriptors (e.g., A2–B2 performance indicators).
- Identifying patterns in language use, such as recurring grammatical errors, lexical limitations, or discourse organization issues.
- Suggesting specific improvement strategies, such as revising connectors, expanding topic-specific vocabulary, or improving coherence.
- Generating differentiated feedback, tailored to proficiency level, task type (essay, presentation, project), or skill area (speaking, writing, reading, listening).

Importantly, the integration of AI-based feedback tools also strengthens feedback literacy, a concept developed by David Carless and David Boud. Feedback literacy emphasizes students' capacity to understand, interpret, and act upon feedback. AI-generated drafts can be structured in ways that:

- Use clear, student-friendly language.
- Include examples of improved versions of sentences.
- Provide reflective prompts (e.g., *How could you make this argument more precise?*).
- Encourage revision cycles rather than one-time corrections.

However, ethical and pedagogical considerations remain essential. Teachers must:

- Review AI suggestions to ensure disciplinary accuracy.

- Protect student data and privacy.
- Avoid over-automation that reduces meaningful human interaction.
- Maintain the dialogic nature of feedback.

In conclusion, AI-powered extended feedback tools can enhance efficiency, consistency, and personalization in assessment practices. When critically mediated by the teacher, these tools strengthen formative assessment processes and foster students' feedback literacy, autonomy, and continuous improvement.

4.19 AI for Material Creation

AI for material creation refers to the application of artificial intelligence techniques—such as machine learning, deep learning, and generative modeling—to discover, design, and optimize new materials with targeted physical, chemical, or mechanical properties. Rather than relying exclusively on traditional trial-and-error experimentation, AI systems analyze large datasets of existing materials to identify patterns, predict performance, and propose novel compositions or structures.

This emerging field is closely linked to initiatives such as the Materials Genome Initiative, which promotes the integration of computational tools, high-throughput experimentation, and data-driven approaches to accelerate materials discovery.

Key Applications

1. **Property Prediction**
   AI models can predict properties such as conductivity, hardness, thermal resistance, corrosion resistance, or catalytic activity based on known structural and compositional data.
2. **Inverse Design**
   Instead of asking *"What properties does this material have?"*,
   AI enables researchers to ask *"What material structure will achieve this desired property?"*

Algorithms generate candidate materials optimized for specific performance criteria.

High-Throughput Screening

High-throughput screening (HTS) in AI-driven material discovery refers to the rapid computational evaluation of thousands or even millions of hypothetical compounds to identify promising candidates with targeted properties. Instead of synthesizing and testing each material experimentally, machine learning models predict performance metrics—such as stability, conductivity, catalytic efficiency, or mechanical strength—based on patterns learned from existing datasets.

This approach is strongly aligned with the objectives of the Materials Genome Initiative, which promotes integrating computation, data science, and experimental validation to accelerate innovation cycles.

In practice, HTS involves:

- **Large-scale databases** of known materials (crystalline structures, molecular compounds, alloys).
- **Predictive models** trained to estimate physical and chemical properties.
- **Automated ranking systems** that prioritize the most promising candidates for laboratory synthesis.
- **Iterative feedback loops**, where experimental results refine the model's accuracy.

For example, in energy research, AI-based screening can evaluate vast chemical spaces to identify new battery materials or catalysts for hydrogen production. By narrowing down viable options before laboratory testing, researchers significantly reduce experimental time, material waste, and financial costs.

Overall, high-throughput screening transforms material discovery from a predominantly experimental, trial-and-error process into a data-driven, computationally guided strategy, improving efficiency while maintaining scientific rigor through subsequent empirical validation.

3. **Generative Models for Novel Materials**

   Deep learning architectures, including generative adversarial networks (GANs) and variational autoencoders (VAEs), can design entirely new molecular or crystalline structures.

Benefits

- Faster discovery cycles
- Reduced research and development costs
- Lower environmental impact through optimized materials
- Improved performance in energy, medicine, electronics, and construction

Challenges

- Limited high-quality datasets
- Model interpretability issues
- Need for experimental validation
- Data standardization and sharing

AI for material creation represents a paradigm shift from empirical discovery toward predictive and data-driven innovation, accelerating advancements in fields such as renewable energy, nanotechnology, aerospace engineering, and sustainable manufacturing.

Using AI to Create Learning Materials

Artificial Intelligence (AI) can support teachers in designing innovative, level-appropriate, and engaging learning materials. By analyzing patterns from existing lessons, curricula, and student performance data, AI tools can generate customized exercises, worksheets, assessments, and interactive activities aligned with instructional objectives.

In language education contexts—particularly relevant to your work in English teaching—AI can enhance lesson planning efficiency while maintaining pedagogical quality when guided by the teacher's expertise.

For example, AI can:

- **Suggest vocabulary exercises** tailored to CEFR levels (A1–C1), focusing on frequency, collocations, or field-specific terminology (e.g., English for Forestry or Tourism).
- **Generate reading passages** aligned with lesson themes, incorporating target grammar structures or discourse functions.
- **Design quizzes, gap-fill tasks, or grammar games** that reinforce specific linguistic objectives.
- **Create differentiated activities** for mixed-ability classrooms.
- **Develop speaking prompts or project-based tasks** connected to real-world scenarios.

This approach aligns with contemporary perspectives on technology-enhanced learning and adaptive instruction. AI functions as a creative assistant, helping teachers overcome time constraints while expanding pedagogical possibilities.

However, professional judgment remains essential. Teachers should:

- Review AI-generated materials for accuracy and clarity.
- Ensure alignment with curriculum standards and learning outcomes.
- Adapt tone, cultural references, and complexity to students' needs.
- Verify ethical use and protect student data privacy.

When thoughtfully integrated, AI supports instructional innovation, promotes student engagement, and strengthens lesson effectiveness. Rather than replacing teachers, AI enhances their capacity to design meaningful and dynamic learning experiences on a daily basis.

4.19 Slides AI

Slides AI is an AI-powered tool that converts text into presentation slides — essentially it turns your notes, essays, reports, or even a simple topic into a structured slide deck automatically. It works as an add-on/integration for common presentation software: you can use it inside Google Slides or Microsoft PowerPoint.

Transforms text into formatted slide presentations featuring:

- images
- structure
- simplified explanations

Images

SlidesAI automatically suggests or inserts relevant images that match the topic of the text. These visuals help reinforce key concepts, make slides more engaging, and support visual learners. Instead of searching manually for pictures, the tool selects images aligned with the content theme, saving time while improving presentation quality.

Structure

The tool organizes the original text into a logical slide format. It separates content into titles, subtitles, and bullet points, ensuring clarity and readability. Long paragraphs are divided into manageable sections, and key ideas are highlighted. This structured layout helps maintain audience attention and improves information flow throughout the presentation.

Simplified Explanations

SlidesAI condenses complex information into concise, presentation-friendly language. It removes unnecessary details and focuses on the main ideas, making content easier to understand during oral delivery. This is especially useful in educational settings, where clarity and accessibility are essential for effective learning.

4.20 Using SlidesAI to Make Presentations

Teachers and students can use SlidesAI to quickly turn text into slides for a presentation. For example, if a student writes an essay or takes notes on a topic, SlidesAI can make a structured slide deck automatically.

The slides can include:

Images to show ideas clearly

Structured text with headings and bullet points

SlidesAI works with popular programs like Google Slides or Microsoft PowerPoint, making it easy to create presentations quickly. Teachers can check and edit the slides to make sure everything is correct and suitable for the class. Using SlidesAI saves time and helps students make professional-looking presentations even if they are not very experienced with slide design.

Real Example: Using SlidesAI in an English Class

In a secondary English class, students are working on the topic "The Importance of Forests." They first write a short essay and then transform it into a presentation.

Class Activity: From Writing to Presentation

Students use SlidesAI with Google Slides or PowerPoint.

Step-by-Step Practice:

1. Writing Stage:

✓ Students write a short paragraph or essay about forests.

Example: "Forests are important because they provide oxygen, protect animals, and help the climate."

2. AI Slide Generation:

✓ Students paste their text into SlidesAI.

✓ The AI automatically creates slides with:

Titles (e.g., "Why Forests Matter")

Bullet points

Organized sections

3. Visual Enhancement:

✓ SlidesAI adds suggested images and layouts.

✓ Students review and choose the most appropriate visuals.

4. Editing and Personalization:

- ✓ Students edit the slides to improve clarity and accuracy.
- ✓ They simplify sentences and highlight key ideas.

5. Presentation:

- ✓ Students present their slides to the class.
- ✓ They practice speaking clearly and confidently.

How SlidesAI Supports Learning:

• Images:

Help students understand and explain ideas visually.

• Structured text:

Organizes information into clear points.

• Easy integration:

Works with tools like Google Slides and PowerPoint.

Learning Results:

- ✓ Improved organization of ideas
- ✓ Better presentation and speaking skills
- ✓ Increased confidence using digital tools
- ✓ Time-saving for both teachers and students

Using Slides AI helps students transform their writing into clear, professional presentations quickly. It supports learning by combining writing, reading, and speaking skills in an efficient and engaging way.

4.21 Canva with AI Integration

Canva is a popular online design platform that lets you create visuals: presentations, social-media graphics, posters, videos, documents, websites, and more. "AI integration" means Canva now uses built-in artificial intelligence tools so that even users without formal design skills can generate, edit, and refine high-quality designs – often starting from just a prompt or simple text description.

Canva supports the creation of:

- Posters
- Worksheets
- Digital flashcards
- Infographics
- Storybooks

Its AI design tools reduce the time and expertise required to create visually appealing materials.

4.21.1 Using Canva with AI for Classroom Materials

Teachers and students can use Canva with AI to make visual materials quickly and easily. Even if someone does not have design skills, Canva's AI can help create, edit, and improve posters, worksheets, flashcards, and more.

For example, AI in Canva can help make:

- **Posters** for classroom displays
- **Worksheets** for exercises or homework
- **Digital flashcards** for vocabulary practice
- **Infographics** to explain topics clearly
- **Storybooks** with images and text

Using Canva with AI saves time and makes materials look professional and attractive. Teachers can also customize the designs to fit the lesson topic or student level, helping students learn better with visual and interactive resources.

Real Example: Using Canva with AI in an English Class

In an A2 English class, the teacher is teaching "Vocabulary about Animals and Habitats."

Class Activity: Creating Visual Learning Materials

The teacher and students use Canva with AI tools to design engaging materials.

Step-by-Step Practice:

1. Teacher Preparation:

- ✓ The teacher uses Canva AI to create a colorful poster with categories: forest, desert, ocean.
- ✓ AI suggests layouts, icons, and images automatically.

2. Vocabulary Flashcards:

- ✓ Students create digital flashcards in Canva.
- ✓ Each card includes:

A word (e.g., tiger)

An image generated or suggested by AI

A simple sentence: "The tiger lives in the forest."

3. Worksheet Creation:

- ✓ The teacher designs a worksheet using Canva templates.
- ✓ Activities include: matching words with images, fill-in-the-blank, and short sentences.

4. Infographic Task:

- ✓ Students create a simple infographic:

"Animals and Their Habitats"

- ✓ They organize information visually using icons and short text.

5. Mini Storybook:

- ✓ In groups, students design a short digital storybook (e.g., "A Day in the Jungle").
- ✓ They combine images and simple sentences.

How Canva AI Supports Learning:

• Posters:

Visual classroom displays make vocabulary easier to remember.

• Worksheets:

Teachers create professional materials quickly.

• Flashcards:

Students practice vocabulary in a visual and interactive way.

• Infographics:

Information is clear, simple, and engaging.

• Storybooks:

Students develop creativity and writing skills.

Learning Results:

- ✓ Improved vocabulary retention
- ✓ Enhanced creativity and motivation
- ✓ Better writing and visual communication skills
- ✓ Development of digital literacy

Using Canva with AI helps teachers and students create high-quality materials and quickly. It makes lessons more visual, interactive, and engaging, especially for language learning.

4.22 Gamma

Gamma converts long text into interactive web-based presentations, ideal for:

- digital reading modules
- self-access learning
- microlearning units
- portfolios

4.22.1 Using Gamma for Interactive Presentations

Teachers and students can use Gamma to turn long texts into interactive web-based presentations. This makes learning more interesting and easy to follow. Gamma is useful for creating:

- **Digital reading modules** for reading practice
- **Self-access learning materials** that students can use on their own
- **Microlearning units** with short lessons or activities
- **Portfolios** to show students' work

Using Gamma helps students learn at their own pace and allows teachers **to share interactive lessons** online quickly. It makes long texts easier to understand and more engaging for learners.

Real Example: Using Gamma in an English Class

In a secondary English class, the teacher wants students to understand a reading text about "Climate Change and Forests."

Class Activity: Interactive Reading with Gamma

The teacher uses Gamma to transform a long reading text into an interactive presentation.

Step-by-Step Practice:

1. Content Creation - Teacher:

- ✓ The teacher uploads or pastes a long text into Gamma.
- ✓ Gamma automatically organizes the content into slides.
- ✓ The teacher adds images, key points, and short questions.

2. Student Interaction:

- ✓ Students access the presentation on their devices.
- ✓ They read short sections instead of one long text.
- ✓ Each section includes guiding questions (e.g., "Why are forests important?").

3. Microlearning Activities:

- ✓ After each slide, students answer quick comprehension questions.
- ✓ They can move at their own pace.

4. Vocabulary Focus:

- ✓ Key words (e.g., deforestation, climate, biodiversity) are highlighted.
- ✓ Students write sentences using the new vocabulary.

5. Follow-Up Task:

- ✓ Students create their own mini-presentation in Gamma about a related topic (e.g., "Protecting Forests").

How Gamma Supports Learning:

• Digital reading modules:

Students read organized, interactive content instead of long paragraphs.

• Self-access learning:

Students can review the presentation at home anytime.

• Microlearning units:

Information is divided into small, easy-to-understand sections.

• Portfolios:

Students create and share their own presentations as part of their work.

Learning Results:

- ✓ Improved reading comprehension
- ✓ Better vocabulary acquisition
- ✓ Increased student engagement
- ✓ Development of digital and presentation skills

Using Gamma helps transform traditional reading into an interactive experience. Students stay engaged, understand content more easily, and learn at their own pace, making lessons more effective and student-centered.

4.23 AI Tools for Students

AI tools for students are transforming the way learning and research are approached by providing intelligent support for a variety of academic tasks. These tools can assist in generating summaries, solving complex problems, organizing study materials, and even offering personalized tutoring based on a student's learning pace. Applications like ChatGPT, AI-based math solvers, and writing assistants help students enhance productivity, improve understanding, and save time on repetitive tasks. Additionally, AI tools encourage creativity by suggesting ideas, refining drafts, or providing interactive learning experiences, making education more accessible and engaging in the digital age.

AI supports student autonomy, engagement, and personalization in language practice.

How AI Tools Help Students Learn

AI tools can help students learn and do research in many ways. For example, they can:

- **Summarize texts** to make reading easier
- **Solve problems** in subjects like math
- **Organize study materials** for better understanding
- **Give personalized tutoring** that matches a student's learning pace

Tools like ChatGPT, math solvers, and writing assistants help students save time and improve their work. AI can also suggest ideas or help improve drafts, which makes learning more creative and engaging.

Using AI helps students work independently, practice language skills, and learn in a way that suits them best. It makes education more accessible and interesting in the digital age.

4.24 Speaking Practice With Chatbots

Speaking practice with chatbots allows students to improve their communication and language skills in a safe, interactive environment. Chatbots powered by AI can simulate real-life conversations, correct mistakes, and provide instant feedback, helping learners build confidence without the pressure of speaking to a human. They are available 24/7, allowing students to practice at their own pace, repeat exercises as needed, and explore various scenarios—from casual conversations to professional dialogues.

By using chatbots, students can enhance pronunciation, vocabulary, and fluency, making language learning more engaging, flexible, and effective.

AI chatbots provide:

- Follow-up questions
- Grammar correction
- Natural conversation sequencing

- Personalized pacing
- Scenario-based dialogues

Students often feel less anxious speaking to AI, which lowers affective filters (Krashen, 2003).

Benefits

- Low-stress practice
- Instant feedback
- Unlimited repetition
- Adaptive difficulty

Tools

- ChatGPT voice interactions
- Replika, Speak.com
- In-app chatbots (Duolingo, Elsa Speak)
- Speech recognition APIs

4.24.1 Practicing Speaking with AI Chatbots

Students can use AI chatbots to practice speaking English in a safe and interactive way. Chatbots can simulate real conversations, correct mistakes, and give instant feedback. This helps students build confidence without feeling nervous about talking to a real person.

Chatbots are available anytime, so students can practice at their own pace, repeat exercises, and try different situations, such as casual chats or professional dialogues.

AI chatbots can help with:

- Asking follow-up questions
- Correcting grammar
- Creating natural conversations
- Adjusting speed and difficulty
- Practicing scenario-based dialogues

Tools that students can use include ChatGPT with voice, Replika, Speak.com, and chatbots in apps like Duolingo or Elsa Speak.

4.24.2 Benefits of speaking with chatbots:

- Low-stress practice
- Immediate feedback
- Unlimited repetition
- Adaptive difficulty

Using chatbots makes language learning fun, flexible, and effective, helping students improve pronunciation, vocabulary, and fluency while lowering anxiety about speaking (Krashen, 2003).

Real Example: Speaking Practice with AI Chatbots in an English Class

In an A2 English class, the teacher wants students to practice everyday conversations, especially ordering food in a restaurant.

Class Activity: AI Chatbot Conversation

Students use a chatbot like ChatGPT to simulate a real-life dialogue.

Step-by-Step Practice:

1. Task Introduction:

- ✓ The teacher gives the situation: "You are in a restaurant. Order food and ask about the menu."

2. Chatbot Interaction:

- ✓ Students type or speak to the chatbot:

"Hello, I would like a menu, please."

- ✓ The chatbot responds naturally:

"Of course! What would you like to eat?"

3. Continued Conversation:

- ✓ Students continue the dialogue, asking questions and responding.
- ✓ The chatbot adapts to their level and answers.

4. Feedback and Repetition:

- ✓ Students can ask: "Is my sentence correct?"
- ✓ The chatbot corrects errors and suggests better phrases.
- ✓ Students repeat the conversation several times.

How the Benefits Appear in Practice:

• Low-stress practice:

Students feel comfortable because they are not speaking in front of the whole class.

• Immediate feedback:

The chatbot corrects mistakes instantly (grammar, vocabulary, expressions).

• Unlimited repetition:

Students can practice the same conversation many times until they feel confident.

• Adaptive difficulty:

The chatbot adjusts responses based on student level and input.

Follow-Up Activity:

- ✓ Students perform the same dialogue in pairs.
- ✓ They compare their chatbot practice with real interaction.

Learning Results:

- ✓ Improved fluency and confidence
- ✓ Better pronunciation and vocabulary use
- ✓ Reduced anxiety when speaking English

Using chatbots like ChatGPT creates a safe and flexible learning environment. Students practice speaking more, make fewer errors over time, and become more confident communicators—supporting the idea of lowering the affective filter (Krashen).

4.25 Automatic Writing Correction Tools

Automatic writing correction tools use Artificial Intelligence (AI) and Natural Language Processing (NLP) to analyze written texts and provide immediate, detailed feedback. These tools support students in improving accuracy, clarity, coherence, and overall writing quality.

Platforms such as Grammarly and QuillBot are widely used in educational contexts to enhance the writing process through automated suggestions and revisions.

AI writing tools typically offer feedback on:

Grammar and Syntax

They detect grammatical errors such as subject–verb agreement issues, incorrect verb tenses, article misuse, preposition errors, and sentence structure problems. The tools provide suggested corrections and explanations that help learners understand their mistakes.

Spelling and Punctuation

They automatically identify spelling mistakes, capitalization issues, and incorrect punctuation usage (commas, apostrophes, quotation marks, etc.), promoting greater writing accuracy.

Vocabulary and Word Choice

AI tools suggest alternative words or phrases to improve precision, avoid repetition, and enhance academic tone. This is particularly useful for English as a Foreign Language (EFL) learners seeking to expand lexical range.

•Clarity and Conciseness

They highlight wordy or unclear sentences and recommend more concise or direct alternatives. This helps students produce clearer and more professional texts.

Style and Tone

Some tools analyze whether the text sounds formal, informal, academic, or conversational. They suggest adjustments depending on the intended audience and purpose.

Paraphrasing and Rewriting

Tools like QuillBot assist in rephrasing sentences while maintaining meaning, supporting students in improving fluency and avoiding plagiarism when used responsibly.

Pedagogical Value

In educational settings, automatic writing correction tools:

- Provide immediate formative feedback
- Encourage learner autonomy and self-editing
- Reduce teacher correction workload
- Support drafting and revision cycles

However, teachers should guide students on ethical use, ensuring that these tools enhance learning rather than replace critical thinking and writing development. When integrated thoughtfully, AI writing correction tools become powerful supports for developing academic writing skills.

Using AI for Writing Correction

Students can use AI writing tools like Grammarly or Quillbot to improve their writing. These tools give feedback on different parts of a text, such as:

- **Grammar** (correcting mistakes in sentences)
- **Mechanics** (punctuation and spelling)
- **Style** (making writing clear and easy to read)
- **Tone** (making the text friendly, formal, or professional)
- **Cohesion** (connecting ideas in a smooth way)

Using these tools helps students write better, learn from their mistakes, and gain confidence. Teachers can guide students to check the AI suggestions and make changes that improve their writing while keeping their own ideas.

Pedagogical Best Practices

Students should:

- Evaluate AI corrections
- Justify changes
- Analyze error patterns
- Maintain authorship of their text

This aligns with process-writing pedagogy and metacognitive development.

Best Practices for Using AI in Writing

When students use AI writing tools, they should use them carefully and think about their learning. For example, students can:

- Check AI corrections to see if they are correct.
- Explain why they made changes to their text.
- Look for common mistakes and learn from them.
- Keep their own ideas in the writing, making sure the text is still their work.

These practices help students improve their writing, understand their mistakes, and develop thinking skills. Using AI this way follows process-writing methods and helps students become more independent and reflective learners.

Explanation

This example shows that AI tools should be used as learning support, not as a replacement for students' thinking.

- **Check AI corrections:**
  Students don't just accept suggestions—they evaluate if they are correct. This builds critical thinking.
- **Explain changes:**
  When students justify edits, they understand grammar and structure, not just fix errors.
- **Identify common mistakes:**
  Recognizing patterns (e.g., verb tense errors) helps students learn from mistakes and avoid repeating them.
- **Keep original ideas:**
  Students ensure the text reflects their own voice and creativity, maintaining academic integrity.

Overall Meaning:

AI becomes a tool for reflection and improvement, helping students develop writing skills, autonomy, and deeper understanding—aligned with the process-writing approach (drafting, revising, reflecting).

Real Example: AI-Supported Writing in an English Class

In a secondary English class, students are asked to write a short paragraph about "The Importance of Forests."

Step-by-Step Classroom Practice:

1. First Draft (Student Work):

Students write their own paragraph without AI.

Example (student draft):

"Forests is very important because give us oxygen and animals live here. People cut trees and this is bad for the planet."

2. AI Support with Grammarly

- ✓ Students paste their text into the tool.
- ✓ The AI suggests corrections (grammar, spelling, structure).

AI suggestions:

"Forests are very important because they give us oxygen and animals live there. People cut trees, and this is bad for the planet."

3. Checking AI Corrections:

- ✓ Students review each correction carefully.
- ✓ They decide if the suggestion is correct or not.

Example:

Student notices "is → are" and understands subject-verb agreement.

4. Explaining Changes:

- ✓ Students write short explanations:

"I changed 'is' to 'are' because forests is plural."

5. Identifying Common Mistakes:

- ✓ Students highlight repeated errors:

Verb agreement (is/are)

Missing articles (the, a)

Sentence structure

6. Final Version (Student Voice Maintained):

- ✓ Students rewrite the paragraph using corrections but keeping their ideas:

"Forests are very important because they give us oxygen and provide homes for animals. However, people cut down trees, and this harms the planet."

Learning Results:

- ✓ Students improve grammar and accuracy
- ✓ They develop critical thinking by evaluating AI suggestions
- ✓ They understand their own mistakes
- ✓ They keep their original ideas and voice

Why This Is Effective:

Using tools like Grammarly helps students revise and reflect, not just correct errors. They actively learn from feedback instead of passively accepting it.

Overall Meaning:

AI becomes a learning partner, not a replacement.

Students follow the process-writing approach:

drafting → revising → reflecting, which builds autonomy, responsibility, and stronger writing skills.

4.26 Pronunciation and Fluency Apps

Tools like Elsa Speak, Speechling, and YouGlish support:

- **Articulation** (pronouncing sounds clearly)
- **Stress patterns** (knowing which syllables are strong)
- **Prosody** (the rhythm and melody of speech)
- **Fluency metrics** (speed and smoothness of speaking)

AI in these apps gives visual feedback, so students can see their mistakes and monitor their progress. They can practice as many times as needed, which helps improve pronunciation and fluency in a fun and interactive way.

Real Example: Improving Pronunciation with AI Apps in an English Class

In an A2 English class, the teacher wants students to improve their pronunciation and speaking confidence.

Activity: Daily Pronunciation Practice

The teacher introduces the word list: "environment, forest, water, climate".

Students use apps like Elsa Speak, Speechling, and YouGlish.

Step-by-Step Process:

1. Listening and Modeling:

- ✓ Students listen to the correct pronunciation in the app.
- ✓ They repeat the words several times.

2. AI Feedback:

- ✓ The app analyzes their pronunciation.
- ✓ Students receive visual feedback (e.g., which sounds are incorrect).
- ✓ They notice specific problems like stress or unclear sounds.

3. Practice and Improvement:

- ✓ Students repeat the words until they improve their score.
- ✓ They focus on stress patterns (e.g., en-VI-ron-ment).

4. Fluency Practice:

- ✓ Students record a short sentence:

  "The forest is important for the environment."
- ✓ The app evaluates speed, rhythm, and clarity.

5. Speaking Task:

- ✓ Students say their sentences in pairs.
- ✓ Classmates give simple feedback.

Learning Results:

- ✓ Students improve articulation by practicing difficult sounds

- ✓ They learn correct stress and rhythm
- ✓ They gain confidence through repetition
- ✓ They become more fluent and natural speakers

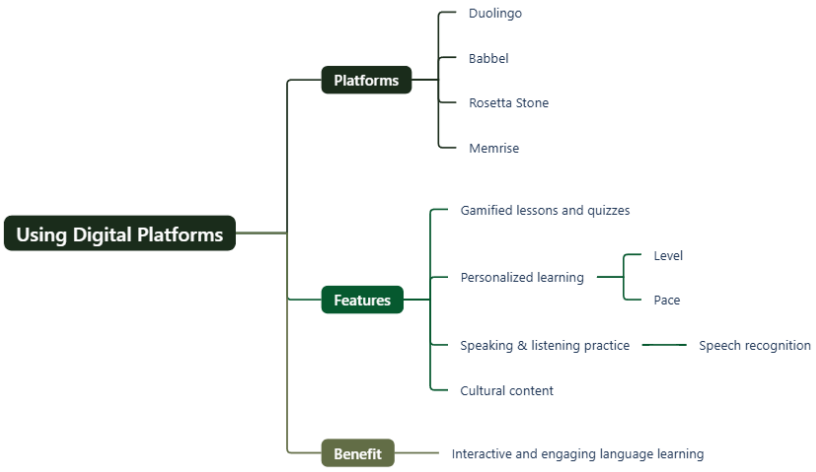
AI tools give instant, personalized feedback, allowing students to practice independently and track their progress. This makes pronunciation practice more effective, engaging, and student-centered.

4.27 Digital Platforms for Language Learning

Digital platforms for language learning have revolutionized how students acquire new languages by providing interactive, flexible, and personalized experiences. Tools like Duolingo, Babbel, Rosetta Stone, and Memrise offer gamified lessons, quizzes, and exercises that adapt to the learner's level and pace. These platforms often include speech recognition, listening practice, and cultural insights, helping students develop reading, writing, speaking, and comprehension skills simultaneously. By combining convenience with engaging content, digital platforms make language learning more accessible, motivating, and effective for learners of all ages.

- **Using Digital Platforms to Learn English**

Figure 19. • Using Digital Platforms to Learn English



Source: Author's own elaboration.

Students can use digital platforms like Duolingo, Babbel, Rosetta Stone, or Memrise to learn English in an interactive way. These platforms offer:

- Gamified lessons and quizzes that make learning fun
- Exercises that match the student's level and pace
- Speech recognition and listening practice to improve speaking and understanding
- Cultural tips to learn about English-speaking countries

These tools help students practice reading, writing, speaking, and listening at the same time. Learning on digital platforms is flexible, so students can practice anytime and anywhere, making language learning more accessible, motivating, and effective.

- **Gamified Quiz Platforms**

Gamified quiz platforms are digital tools that turn learning, assessment, or team engagement into interactive, game-like experiences. They combine quizzes, points, leaderboards, badges, and timed challenges to motivate users, increase participation, and make knowledge retention more enjoyable. Commonly used in classrooms, corporate training, and team-building

exercises, these platforms encourage competition and collaboration, providing instant feedback and analytics to track progress. Popular examples include Kahoot!, Quizizz, and Socrative, which enable educators and facilitators to create customizable quizzes that engage learners through visual elements, music, and interactive gameplay, making learning more dynamic and memorable.

Gamification increases motivation, engagement, and memory retention (Deterding, 2012).

- Kahoot – competitive quiz games
- Quizizz – self-paced and homework modes
- Blooket – game-based vocabulary and grammar review

- **Using Gamified Quiz Platforms in Class**

Teachers can use gamified quiz platforms to make learning fun and interactive. These tools turn quizzes into games with points, badges, and leaderboards. Students can compete or work together while learning.

Popular platforms include:

- **Kahoot!** – competitive quiz games in class
- **Quizizz** – quizzes students can do at their own pace or as homework
- **Blooket** – games for practicing vocabulary and grammar

Using gamified quizzes helps students stay motivated, participate more, and remember what they learn. They also get instant feedback on their answers, which helps them improve quickly.

4.28 Collaborative Walls and Whiteboards

Collaborative walls and whiteboards are tools—physical, digital, or hybrid—that provide a shared space for teams to visualize ideas, plan projects, and brainstorm together. Physical whiteboards and wall-sized panels (workwalls) allow in-person groups to draw, write, and organize content visibly, while interactive smart boards add touch-enabled, digital functionality, integrating

media and supporting hybrid collaboration. Virtual or online whiteboards extend this concept to remote teams, offering real-time or asynchronous editing, infinite canvases, and persistent records of work. These tools enhance communication, creativity, and planning by turning abstract ideas into visible, editable artifacts, making them indispensable in offices, classrooms, design studios, and remote collaboration environments.

- Padlet – multimedia boards for writing, brainstorming, portfolios
- Jamboard/Miro – collaborative brainstorming, grammar demonstrations

These platforms promote cooperative learning and multimodal expression.

Using Collaborative Walls and Whiteboards in Class

Teachers and students can use collaborative walls and whiteboards to share ideas and work together. These tools can be physical, digital, or hybrid.

For example:

- Shared documents like Google Docs allow students to write and edit texts together in real time, making collaboration easy and efficient.
- Interactive boards such as Padlet or Miro let students post ideas, images, and videos, creating a dynamic space for brainstorming and discussion.
- Virtual classrooms like Microsoft Teams enable communication, file sharing, and group work, even outside the classroom.
- Live quizzes and polls using Mentimeter help teachers collect instant feedback and engage students during lessons.

These tools help students plan projects, brainstorm, and practice language. They support cooperative learning and let students express ideas in many ways, making learning more creative and engaging.

Example: Using Collaborative Walls and Whiteboards in an English Class

In an English class, teachers can use collaborative walls and whiteboards to improve speaking, writing, and vocabulary skills in an interactive way.

For example:

- **The teacher creates a topic such as "My Favorite Place" on Padlet.**
  - ✓ Students post short descriptions, images, and key vocabulary.
  - ✓ They read and comment on their classmates' posts.
- **Using Jamboard, students brainstorm ideas for a story.**
  - ✓ Each group adds characters, settings, and events using sticky notes.
  - ✓ The class organizes the ideas together.
- **On Miro, students create a vocabulary map.**
  - ✓ They group words into categories (e.g., food, travel, environment).
  - ✓ They add images and example sentences.

Class Activity Flow

Warm-up:

- ✓ Teacher introduces the topic and key vocabulary.

Collaboration:

- ✓ Students work in groups using digital boards to share ideas.

Practice:

- ✓ Students use the content to speak or write (paragraphs, dialogues).

Feedback:

- ✓ Teacher and peers comment and suggest improvements.

Learning Benefits

- ✓ Improves vocabulary and writing skills
- ✓ Encourages speaking and interaction
- ✓ Promotes teamwork and creativity
- ✓ Develops digital competence

4.29 Learning Platforms and Online Ecosystems

Learning platforms and online ecosystems are digital environments that organize, deliver, and manage educational content and experiences for learners and instructors. They encompass learning management systems (LMS), massive open online courses (MOOCs), virtual classrooms, and

integrated ecosystems that combine content libraries, assessment tools, collaboration features, and analytics. These platforms facilitate personalized learning paths, track progress, and support interaction through discussion boards, live sessions, and gamified elements. By connecting learners, educators, and resources in a centralized, accessible space, learning platforms and ecosystems enhance engagement, scalability, and efficiency in education and corporate training, enabling continuous learning anytime and anywhere.

- Duolingo Classroom – progress tracking, vocabulary mastery
- BBC Learning English – authentic listening and video input

These platforms support autonomous learning and exposure to real-world English.

4.30 Classroom Applications

Classroom applications are software tools and digital platforms designed to enhance teaching, learning, and classroom management. They include interactive apps for quizzes, polls, and collaborative activities, content delivery systems, virtual whiteboards, and platforms for assignments and assessments. These applications help teachers engage students through multimedia, gamification, and real-time feedback, while allowing learners to interact, collaborate, and access resources anytime. By streamlining communication, organizing lessons, and tracking progress, classroom applications make learning more interactive, personalized, and efficient in both physical and virtual learning environments.

4.30.1 Mini-Projects Using AI

ESL Classroom Example: Mini-Projects Using AI in English Class

Level: B1/B2 (Intermediate)

Context: Blended or face-to-face ESL class with access to computers or mobile devices.

Objective:

To integrate AI tools into project-based learning in order to strengthen reading, writing, speaking, listening, creativity, and digital literacy skills.

Project 1: AI-Generated Cultural Guide

Description:

Students create a multimedia guide about a country or culture, combining research skills with AI-supported language development.

Detailed Steps:

1. **Research:**
    - ✓ Students explore topics such as food, traditions, festivals, and daily life.
    - ✓ Use authentic sources (websites, videos, blogs).
2. **AI Support:**
    - ✓ Simplify complex texts for better comprehension.
    - ✓ Identify and learn key vocabulary and expressions.
    - ✓ Generate short summaries of information.
3. **Design & Production:**
    - ✓ Create a digital guide using Canva or Google Slides.
    - ✓ Include images, short texts, and vocabulary sections.
4. **Speaking Practice:**
    - ✓ Record short audio explanations for each section.
    - ✓ Practice pronunciation and intonation.
5. **Presentation:**
    - ✓ Present the guide to the class and answer questions.

Assessment Criteria:

- ✓ Content accuracy
- ✓ Vocabulary use
- ✓ Pronunciation and fluency
- ✓ Creativity and design

Learning Outcome:

Students improve reading comprehension, cultural awareness, and speaking confidence.

Project 2: AI-Enhanced Storytelling

Description:

Students produce a creative story using AI as a support tool, not a replacement for their ideas.

Detailed Steps:

1. **Pre-writing:**
   - ✓ Brainstorm ideas (characters, setting, plot).
2. **Writing Draft:**
   - ✓ Write a first version of the story independently.
3. **AI Support:**
   - ✓ Get suggestions for vocabulary, connectors, and descriptions.
   - ✓ Revise grammar and sentence structure.
4. **Multimedia Creation:**
   - ✓ Generate images to illustrate key scenes.
   - ✓ Organize the story into an e-book format.
5. **Oral Production:**
   - ✓ Record narration of the story (audio or video).
6. **Sharing:**
   - ✓ Upload and share stories in the LMS or class platform.

Assessment Criteria:

- Originality
- Language accuracy
- Story organization
- Oral narration quality

Learning Outcome:

Students develop writing fluency, creativity, and pronunciation skills.

Project 3: AI-Powered Debate Training

Description:

Students use AI tools to prepare and practice arguments for a structured classroom debate.

Detailed Steps:

1. **Topic Selection:**
    - ✓ Choose engaging topics (e.g., "Social media is beneficial for students").
2. **AI Support:**
    - ✓ Generate arguments and counterarguments.
    - ✓ Learn useful debate expressions (agreeing, disagreeing, giving opinions).
3. **Preparation:**
    - ✓ Organize ideas into clear points.
    - ✓ Practice in pairs or small groups.
4. **Debate Performance:**
    - ✓ Participate in a live debate session.
    - ✓ Respond spontaneously to opposing arguments.
5. **Reflection:**
    - ✓ Discuss strengths, weaknesses, and language use after the debate.

Assessment Criteria:

- Clarity of ideas
- Use of language functions
- Fluency and interaction
- Critical thinking

Learning Outcome:

Students improve speaking fluency, argumentation skills, and confidence.

Integration in the Lesson

- Begin with guided instruction and examples.
- Move to project development with teacher support.
- Include peer collaboration and feedback**.**
- End with presentations and reflection activities**.**

Overall Benefits

- Encourages active, student-centered learning.
- Promotes responsible use of AI tools.
- Develops autonomy and critical thinking.
- Integrates all four language skills in real contexts.
- Builds digital literacy and creativity.

Project 4: AI-Powered Storytelling and Digital Presentation

Description:

Students use AI tools to create, develop, and present a digital story, combining creativity, language skills, and technology.

Detailed Steps:

1. Topic Selection:
    - ✓ Students choose a theme (e.g., "A day in the forest", "My future profession", "An environmental problem").

2. AI Support:

- ✓ Use AI to generate story ideas, characters, and settings.
- ✓ Get vocabulary and grammar suggestions.
- ✓ Explore useful expressions for narration (past tense, connectors, descriptions).
- ✓

3. Story Development:

- ✓ Write a short story with beginning, middle, and end.
- ✓ Revise and improve the text using AI feedback.

4. Digital Creation with Canva or PowerPoint

- ✓ Design a visual presentation with images, text, and key scenes.
- ✓ Add audio narration or voice recording.

5. Presentation:

- ✓ Students present their digital story to the class.
- ✓ Practice pronunciation, fluency, and storytelling skills.

6. Reflection:

- ✓ Students reflect on their learning process.
- ✓ Discuss creativity, language use, and AI support.

Assessment Criteria:

- ✓ Organization and creativity of the story
- ✓ Use of vocabulary and grammar
- ✓ Pronunciation and fluency
- ✓ Quality of digital presentation

Learning Outcome:

- ✓ Students improve writing, speaking, and digital communication skills while developing creativity and confidence in English.

Integration in the Lesson

- ✓ Start with examples of short stories and storytelling techniques.
- ✓ Guide students in planning and drafting.
- ✓ Provide support during digital creation.
- ✓ Finish with presentations and peer feedback.

Overall Benefits

- ✓ Enhances creativity and imagination.
- ✓ Promotes active and meaningful language use.

- ✓ Encourages independent and collaborative learning.
- ✓ Develops digital and communication skills.
- ✓ Makes learning engaging and relevant.

4.30.2 Gamified Activities

Examples:

- Blooket vocabulary battles
- Kahoot grammar tournaments
- Quizizz fluency races
- QR-code scavenger hunts

Gamified Activities in English Class

What they are:

Gamified activities use game elements like points, levels, badges, or challenges to make learning fun and motivating. Students feel like they are playing a game while practicing language skills.

Examples:

1. **Vocabulary Race:** Students answer questions to earn points and move on a leaderboard.
2. **Grammar Quest:** Teams complete grammar challenges to unlock "levels" or rewards.
3. **Interactive Quizzes:** Using platforms like Kahoot! or Quizizz where students answer questions with music, timers, and visuals.
4. **Role-Play Games:** Students take roles (shopkeeper, customer, tourist) and earn badges for completing dialogues correctly.

Explanation:

Gamified activities increase motivation, make students more engaged, and help them remember language better. They also encourage friendly competition, teamwork, and repeated practice, which improves fluency, vocabulary, and grammar in an enjoyable way.

4.30.3 Sample Tasks and Lesson Ideas

- AI Speaking Buddy Task
- AI Writing Improvement Cycle
- Padlet Vocabulary Gallery
- Quizizz Data-Informed Review Lessons
- BBC Learning English Listening Stations

Sample 1 AI-Enhanced Tasks and Lesson Ideas

Teachers can use AI and digital tools to create lessons that are interactive, personalized, and engaging. Here are some examples:

1. **AI Speaking Buddy Task**
    - ✓ Students practice speaking with an AI chatbot.
    - ✓ The chatbot gives instant feedback and asks follow-up questions.
    - ✓ Helps improve fluency, pronunciation, and confidence.
2. **AI Writing Improvement Cycle**
    - ✓ Students write a text, then use AI tools like Grammarly to get suggestions.
    - ✓ They revise their work, reflect on mistakes, and submit a final version.
    - ✓ Supports grammar, style, and writing skills.
3. **Padlet Vocabulary Gallery**
    - ✓ Students create a digital board with new vocabulary words, images, and sentences.
    - ✓ Works as a collaborative gallery where classmates can comment.
    - ✓ Encourages active vocabulary learning and collaboration.
4. **Quizizz Data-Informed Review Lessons**
    - ✓ Teachers use Quizizz quizzes to review topics.
    - ✓ AI analytics show common mistakes so teachers can focus on difficult areas.
    - ✓ Makes review lessons personalized and efficient.

5. **BBC Learning English Listening Stations**
    - ✓ Students listen to authentic English audio and videos online.
    - ✓ They answer comprehension questions and discuss in pairs or groups.
    - ✓ Improves listening skills, vocabulary, and real-world understanding.

These tasks combine AI, digital tools, and interactive learning to make lessons more engaging, effective, and student-centered. They also promote autonomous learning, allowing students to practice at their own pace and get immediate feedback.

Sample 2 AI-Enhanced Tasks and Lesson Ideas

Teachers can integrate AI and digital platforms to design creative, student-centered learning experiences. Here are additional ideas:

1. AI Role-Play Conversation Task

- ✓ Students interact with an AI tool to simulate real-life situations (e.g., ordering food, job interviews).
- ✓ The AI adapts responses based on student input and level.
- ✓ Enhances speaking fluency, real-world communication, and confidence.

2. AI Story Generator Activity

- ✓ Students use AI to generate a short story based on prompts (e.g., "a forest adventure").
- ✓ They edit, expand, and personalize the story.
- ✓ Develops creativity, writing skills, and critical thinking.

3. Digital Pronunciation Lab (with Elsa Speak)

- ✓ Students practice pronunciation using AI-powered apps.
- ✓ The tool gives instant feedback on sounds, stress, and intonation.
- ✓ Improves pronunciation accuracy and speaking confidence.

4. Collaborative Writing with Google Docs

- ✓ Students co-write essays or dialogues in real time.
- ✓ AI suggestions and peer editing improve the final product.
- ✓ Encourages teamwork, writing development, and revision skills.

5. Interactive Grammar Practice with Kahoot!

- ✓ Teachers create grammar quizzes with instant feedback.
- ✓ Students compete in a fun, game-based environment.
- ✓ Reinforces grammar through engagement and repetition.

6. AI-Powered Reading Companion

- ✓ Students read a digital text and use AI tools to ask questions about vocabulary or meaning.
- ✓ The AI provides explanations and summaries.
- ✓ Supports reading comprehension and independent learning.

These activities integrate AI and technology to create dynamic and meaningful learning experiences. They help students become more autonomous, motivated, and engaged while developing essential language skills in a modern, digital environment.

Sample 3 AI-Enhanced Tasks and Lesson Ideas

Teachers can use AI and digital tools to promote creativity, interaction, and independent learning. Here are more examples:

1. AI Debate Partner Task

- ✓ Students discuss a simple topic (e.g., "Is technology good for learning?") with an AI chatbot.
- ✓ The AI provides arguments and asks students to respond.
- ✓ Develops speaking skills, critical thinking, and argumentation.

2. Smart Vocabulary Builder with Quizlet

- ✓ Students create digital flashcards with definitions, images, and audio.
- ✓ AI suggests related words and practice activities.
- ✓ Strengthens vocabulary retention and pronunciation.

3. AI Listening Quiz Generator

- ✓ Teachers use AI tools to create listening exercises from short audio clips.
- ✓ Students answer comprehension questions and receive instant feedback.
- ✓ Improves listening accuracy and understanding.

4. Visual Learning Boards with Canva

- ✓ Students design posters or infographics using new language concepts.
- ✓ AI design suggestions help organize content visually.
- ✓ Encourages creativity and reinforces learning.

5. AI Email Writing Assistant

- ✓ Students write formal or informal emails.
- ✓ AI tools provide corrections and suggestions for tone and structure.
- ✓ Enhances writing clarity, grammar, and real-life communication skills.

6. Peer Feedback with Microsoft Teams

- ✓ Students share their work and give feedback through digital platforms.
- ✓ AI tools highlight errors and improvement areas.
- ✓ Promotes collaboration, reflection, and editing skills.

These AI-supported activities make lessons more interactive and adaptable to student needs. They encourage participation, improve language skills, and help learners become more confident and independent in their learning process.

Conclusions

- ✓ The integration of technology in English language teaching has evolved from simple drill-based systems to advanced, interactive, and AI-driven environments that support meaningful communication and personalized learning.
- ✓ Effective use of technology requires a strong pedagogical foundation, where tools are aligned with learning objectives and supported by theories such as communicative learning, constructivism, and frameworks like TPACK and SAMR.
- ✓ Digital tools—including VR, AI, LMS platforms, and mobile applications—enhance language acquisition by increasing motivation, providing authentic materials, and promoting collaboration, autonomy, and digital literacy.
- ✓ The successful implementation of technology also depends on ethical considerations, teacher training, and responsible use, ensuring privacy, inclusivity, and academic integrity while preparing students for real-world communication in a digital society.
- ✓ Blended learning models effectively combine face-to-face interaction with digital environments, offering flexibility and improving both engagement and language practice opportunities.
- ✓ Emerging technologies such as Virtual Reality and Artificial Intelligence create immersive and adaptive learning experiences that enhance fluency, pronunciation, and contextual language use.
- ✓ Continuous assessment through digital tools allows for immediate feedback, progress tracking, and personalized support, helping learners improve more efficiently.
- ✓ Developing digital literacy is essential for both teachers and students, as it enables critical evaluation of information, responsible technology use, and active participation in modern educational and professional contexts.

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Integrating Technology in English Classes explains how digital tools are transforming teaching. It highlights the importance of using technology as a key part of modern pedagogy. The book shows how AI, virtual environments, and online platforms improve communication and language development. It also emphasizes ethical use, including privacy and digital responsibility. The book connects theory with practical classroom strategies. It promotes interactive, student-centered learning experiences. Teachers are guided to align technology with learning objectives. It encourages autonomy and critical thinking in learners. Digital literacy is presented as an essential skill. Overall, it is a practical guide for effective technology integration in English teaching.

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ISBN: 978-9942-53-163-6

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