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Research Paper

LANGUAGE LEARNING CONVERSATION BUDDY

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Abstract

The Language Learning Conversation Buddy is an Artificial Intelligence-based conversational learning system designed to help users improve their language skills through interactive conversations. Learning a new language requires regular practice in vocabulary, grammar, pronunciation, listening, and communication. However, many learners do not have access to a conversation partner who can practice with them regularly. The proposed system provides an AI-powered virtual conversation partner that is available whenever the learner wants to practice.

The system allows users to select a target language and begin conversations on topics such as daily life, travel, education, shopping, hobbies, workplace communication, and general discussions. Natural Language Processing techniques are used to understand the learner's messages and generate meaningful responses in the selected language. The system can adjust conversations according to the learner's proficiency level, such as beginner, intermediate, or advanced.

A major feature of the system is real-time language feedback. During conversations, the AI can identify common grammar mistakes, incorrect word usage, spelling errors, and vocabulary gaps. Instead of interrupting the conversation continuously, the system can provide corrections and suggestions in a simple format after the learner responds. It can also explain why a particular sentence is incorrect and provide a more natural alternative.

The system can support different learning activities such as role-play conversations, vocabulary practice, grammar exercises, sentence formation, translation activities, and question-and-answer sessions. It can maintain a learner profile containing progress, frequently made mistakes, vocabulary knowledge, and completed activities. Based on this information, the AI can personalize future conversations and recommend areas that require additional practice.

Overall, the Language Learning Conversation Buddy provides an accessible, interactive, and personalized approach to language learning. It can be useful for students, travelers, professionals, and anyone interested in improving their communication skills. Future enhancements can include speech recognition, pronunciation evaluation, multilingual support, voice conversations, emotional and conversational context understanding, and integration with online language-learning platforms.

I. INTRODUCTION

Learning a new language is an important skill for education, employment, travel, communication, and cultural interaction. However, becoming fluent requires continuous practice rather than only studying vocabulary and grammar rules. Learners need opportunities to use the language in realistic conversations. Many learners find it difficult to practice speaking because they may not have a suitable partner or may feel uncomfortable making mistakes in front of others.

Traditional language-learning methods include textbooks, classroom teaching, vocabulary applications, grammar exercises, and recorded lessons. These methods are useful for learning basic concepts, but they may provide limited opportunities for natural conversation. A learner may understand grammar rules but still struggle to construct sentences quickly during a real conversation. Therefore, interactive conversational practice is an important part of effective language learning.

Artificial Intelligence provides an opportunity to create virtual conversation partners that can interact with learners in natural language. NLP techniques allow AI systems to understand questions, responses, and sentence structures. Generative AI can create contextually relevant responses and maintain a conversation across multiple turns. These technologies can make language practice more flexible and accessible.

The **Language Learning Conversation Buddy** is designed to provide continuous conversational practice through an AI-based virtual partner. Users can choose a language, proficiency level, and conversation topic. The system then starts a conversation and responds according to the learner's messages. It can also provide grammar corrections, vocabulary suggestions, sentence improvements, and explanations when mistakes are detected.

The proposed system focuses on creating a comfortable and personalized learning environment. Learners can practice repeatedly without fear of embarrassment and can choose topics that match their interests or real-life needs. By combining conversational AI, language analysis, personalized feedback, and progress tracking, the system aims to improve language confidence and communication skills.

II. LITERATURE SURVEY

Traditional language-learning systems primarily use textbooks, classroom instruction, vocabulary lists, grammar exercises, and recorded lessons. These methods provide learners with structured educational material and help develop foundational language knowledge. However, they generally provide limited opportunities for continuous interactive conversation. Learners may need a teacher or language partner to practice communication skills in real-world situations.

Computer-Assisted Language Learning systems have introduced digital tools for vocabulary practice, grammar exercises, pronunciation activities, and interactive tests. Such systems can provide immediate feedback and allow learners to practice at their own pace. However, many applications focus on individual exercises rather than maintaining natural and context-aware conversations. This creates a gap between completing language exercises and actually using the language in communication.

Natural Language Processing has been widely applied to language-learning applications for grammar checking, spelling correction, translation, text classification, and vocabulary analysis. NLP systems can identify errors in learner-written sentences and suggest corrections. These techniques help learners understand mistakes, but traditional systems may have difficulty maintaining a long, meaningful conversation with context.

Speech recognition and conversational systems have also been used to support language-learning activities. Voice-based systems allow learners to practice speaking and listening instead of relying only on written communication. Pronunciation assessment technologies can analyze spoken language and provide feedback. However, speech recognition accuracy can vary depending on accents, background noise, speaking speed, and language characteristics.

Recent developments in Generative AI and Large Language Models have significantly improved conversational applications. These models can generate context-aware responses, role-play different situations, explain grammar, provide vocabulary suggestions, and adapt conversations to different proficiency levels. However, generated responses may sometimes contain grammatical or factual inconsistencies, making response validation and educational control important.

Existing research demonstrates the potential of combining conversational AI, NLP, speech technologies, and personalized learning for language education. However, challenges remain in maintaining natural conversations, providing accurate corrections, tracking learner progress, and adapting content to individual proficiency levels.

III. SYSTEM ANALYSIS

The **Language Learning Conversation Buddy** is designed to provide interactive language practice through an AI-based virtual conversation partner. The user first selects a target language, proficiency level, and preferred conversation topic. The system creates a learner profile containing language preferences, progress, vocabulary knowledge, and common mistakes. The user then starts a text or voice-based conversation with the AI. The NLP module analyzes each learner response and identifies grammar, spelling, vocabulary, and sentence-formation issues. The conversational AI generates an appropriate response while maintaining the context of the discussion. A feedback module provides corrections and suggests more natural expressions without unnecessarily interrupting the conversation. The system can introduce new vocabulary and explain difficult words based on the learner's level. Role-play scenarios can be used to simulate real-world conversations such as interviews, travel, shopping, and workplace communication. Performance data is recorded to identify repeated mistakes and areas requiring improvement. The recommendation module suggests suitable exercises and future conversation topics. Finally, the learner can view progress, completed activities, vocabulary growth, and personalized improvement suggestions.

Existing System

Existing language-learning systems commonly use textbooks, classroom instruction, vocabulary applications, grammar exercises, translation tools, and predefined

conversation activities. These systems provide structured learning materials but may not offer continuous personalized conversations. Learners often practice grammar and vocabulary separately without applying them in realistic communication situations. Some applications provide predefined dialogues where learners can select from fixed responses. Such conversations may not adapt effectively when learners produce unexpected or incorrect sentences. Traditional systems may also provide limited explanations for grammar and vocabulary mistakes. Speaking practice may require interaction with a teacher or another learner, which is not always available. Some applications provide automated corrections but do not maintain long-term conversation context. Learner progress may focus on completed exercises rather than actual conversational ability. Different learners may receive similar activities even when their weaknesses are different. As a result, traditional language-learning systems may provide useful foundational learning but have limited conversational flexibility and personalization.

Disadvantages of Existing System

- Limited opportunities for natural conversation practice.
- Dependence on teachers or human conversation partners.
- Predefined dialogues may not support flexible conversations.
- Limited understanding of unexpected learner responses.
- Grammar feedback may be basic or disconnected from context.
- Limited personalization based on individual mistakes.
- Speaking and pronunciation practice may be restricted.
- Learners may not receive immediate conversational feedback.
- Limited tracking of repeated language mistakes.
- Vocabulary recommendations may not match learner needs.
- Difficult to practice realistic real-world situations continuously.
- Some learning activities can become repetitive.

Proposed System

The proposed **Language Learning Conversation Buddy** uses Artificial Intelligence and Natural Language Processing to provide personalized conversational language practice. The learner first selects a target language, proficiency level, learning goal, and conversation topic. The system creates a learner profile using these preferences and previous learning performance. A conversational AI engine conducts natural conversations and maintains context across multiple interactions. The NLP module analyzes learner responses to identify grammar, spelling, vocabulary, and sentence-formation errors. A correction engine provides simple explanations and more natural alternatives for incorrect expressions. The system can introduce new vocabulary according to the learner's proficiency and interests. Role-play modules simulate practical situations such as interviews, travel, shopping, restaurants, and workplace communication. A speech module can support voice-based conversations and pronunciation practice when enabled. The progress tracker records learning activities, common mistakes, vocabulary development, and conversation performance. An adaptive recommendation engine uses this information to select future topics and exercises. This creates a flexible learning environment where learners can continuously practice and improve their communication skills.

Advantages of Proposed System

- Provides an AI-based conversation partner available anytime.
- Supports natural and context-aware conversations.
- Provides personalized grammar and vocabulary feedback.
- Adapts conversations to learner proficiency.
- Supports beginner, intermediate, and advanced learners.
- Provides practical role-play scenarios.
- Helps learners practice without fear of embarrassment.
- Tracks common mistakes and learning progress.
- Recommends activities based on individual weaknesses.
- Can support text and voice-based interaction.
- Improves vocabulary and sentence-building skills.
- Provides flexible and self-paced language practice.

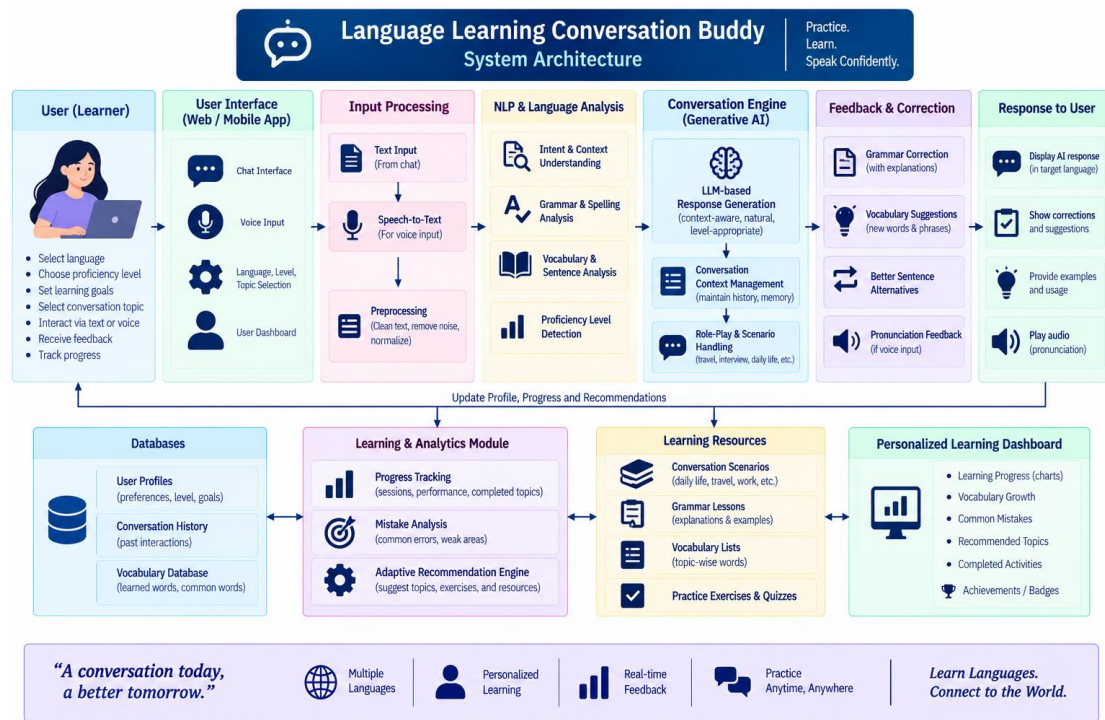
IV. METHODOLOGY

The methodology begins when the learner selects a target language, proficiency level, learning goal, and preferred conversation topic. The system creates a learner profile containing the selected preferences and previous learning information. The conversation engine then starts an interactive discussion appropriate to the learner's level. The learner can communicate using text or voice depending on the available interface. NLP techniques process each response and identify grammar, spelling, vocabulary, and sentence-structure errors. A semantic analysis module determines the meaning and context of the learner's response. The Generative AI engine creates a natural response and continues the conversation while maintaining context. A feedback module identifies important mistakes and provides corrections with simple explanations. A vocabulary module introduces useful words and expressions based on the conversation. Role-play activities are used to simulate real-world communication scenarios. The system records learner performance, repeated mistakes, completed activities, and vocabulary progress. Finally, an adaptive recommendation module uses the collected information to generate personalized exercises and future conversation topics.

SYSTEM ARCHITECTURE

The Language Learning Conversation Buddy consists of multiple modules that work together to provide an interactive and personalized learning experience. The User Interface allows learners to select a language, proficiency level, topic, and communication mode. The Learner Profile Module stores learning preferences, progress, vocabulary, and common mistakes. The Input Processing Module receives text or speech from the learner and prepares it for analysis. The Speech Recognition Module converts spoken responses into text when voice interaction is used. The NLP Language Analysis Module identifies grammar, vocabulary, spelling, and sentence-structure issues. The Conversation Management Module maintains context and manages the flow of the conversation. The Generative AI Engine produces natural and level-appropriate responses. The Feedback and Correction Module provides explanations, corrections, and alternative expressions. The Role-Play Module creates real-world conversation scenarios for practical practice. The Progress Tracking Module records learner performance and identifies repeated mistakes. The Adaptive

Recommendation Engine selects suitable future topics and exercises. Finally, the Learning Dashboard displays conversations, corrections, vocabulary progress, performance statistics, and personalized recommendations.



V. RESULT AND OUTPUT

LinguaBuddy Learn - Chat - Improve - Grow

Home

Start Your Language Journey

Practice real conversations with AI and improve your skills at your own pace.

Choose a Language

English, Spanish, French, German, Japanese, Korean

Set Your Goal

Daily Conversation Practice, Improve Pronunciation, Build Vocabulary, Prepare for Travel / Work, Clear Exams (e.g., IELTS)

Let's Start

Chat with Your AI Language Buddy

Practice, make mistakes, learn and improve!

Feedback & Learning Suggestions

Here are some corrections and tips from your conversation.

Grammar & Corrections

Vocabulary

Pronunciation

Overall Feedback

My Progress

Track your learning journey and see how you're improving!

12 Conversations, 3.5 hrs Practice Time, 85 New Words, 80% Accuracy

Skill Progress

Speaking: 75%, Listening: 70%, Vocabulary: 80%, Grammar: 65%, Pronunciation: 60%

Conversation Activity

Keep going! You've practiced for 5 days this week.

Conversation Summary

Here's a summary of what you discussed.

Topic: Food, Language: Spanish, Duration: 8 minutes, New Vocabulary: 5 words, Corrections: 2, Overall Performance: Great! Keep practicing!

Great Job!

You completed your Spanish conversation session!

"Practice today, fluency tomorrow."

Continue Learning, Try a New Topic, View Progress

VI. CONCLUSION

The Language Learning Conversation Buddy provides an intelligent and interactive platform for learners to improve their language skills through continuous conversation practice. The system allows users to communicate with an AI-based virtual partner without requiring a human conversation partner, making language practice more convenient and accessible.

By combining Artificial Intelligence, Natural Language Processing, Generative AI, and language analysis, the system can understand learner responses and provide meaningful conversations. It can identify grammar, vocabulary, spelling, and sentence-formation mistakes while providing simple corrections, explanations, and more natural alternatives.

The system also supports personalized learning by considering the learner's proficiency level, interests, common mistakes, and learning progress. Role-play scenarios and practical conversations allow learners to practice situations such as travel, interviews, shopping, education, and workplace communication. Progress tracking and adaptive recommendations help learners focus on areas where improvement is needed.

Overall, the Language Learning Conversation Buddy makes language learning interactive, personalized, flexible, and engaging. It can benefit students, professionals, travelers, and anyone who wants to improve their communication skills. In the future, the system can be enhanced with real-time voice conversations, pronunciation scoring, multilingual support, emotion-aware conversations, advanced speech recognition, and integration with online language-learning platforms.

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