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Impact of AI-Mediated Adaptive Learning Systems on Second Language Acquisition

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Abstract:
In the ever-changing environment of educational technology, the pursuit of more effective teaching methods continues to be of utmost importance. This study examines the relative effectiveness of adaptive learning systems (ALSs) compared with conventional classroom techniques in the context of second language acquisition (SLA). This study compares the efficiency of ALSs and conventional classroom methods in the context of SLA to determine which approach yields more favorable learning outcomes. This study assessed the attitudes and outcomes of students through a survey that compared conventional classroom settings with those incorporating ALSs. The questionnaire collected information about students' perspectives on each learning approach without divulging specific details about the ALS technology or classroom methods. The findings reveal an unambiguous preference for ALSs among students compared with conventional methods, which is accompanied by heightened levels of motivation in ALS environments. This suggests that ALSs' personalized learning and motivation strategies exert a significant influence on learners' engagement and proficiency in acquiring a second language. This research carries particular significance for educators and curriculum developers because it underscores the potential of ALSs to revolutionize the process of acquiring a second language. By offering tailored instruction and fostering greater learner engagement, ALSs can significantly enhance the learning experience. The key contribution of this research is the direct comparison of ALSs with conventional methods in the area of second language instruction. In demonstrating ALSs' unique ability to increase motivation and engagement through personalized learning, this study enhances our understanding of effective language teaching strategies.

Keywords: adaptive learning systems, artificial intelligence, second language acquisition, personalized learning, educational technology.

人工智能介导的自适应学习系统对第二语言习得的影响

摘要：
在不断变化的教育技术环境中，追求更有效的教学方法仍然至关重要。本研究探讨了在第二语言习得(SLA)背景下，自适应学习系统(肌萎缩侧索硬化症)与传统课堂技术相比的相对有效性。本研究比较了SLA背景下肌萎缩侧索硬化症和传统课堂方法的效率，以确定哪种方法能产生更有利的学习成果。本研究通过比较传统课堂环境与采用肌萎缩侧索硬化症的课堂环境的调查来评估学生的态度和结果。该调查问卷收集了学生对每种学习方法的看法，但没有透露有关肌萎缩侧索硬化症技术或课堂方法的具体细节。研究结果表明，与传统方法相比，学生对肌萎缩侧索硬化症有着明确的偏好，并且伴随着肌萎缩侧索硬化症环境中的动机水平的提高。这表明肌萎缩侧索硬化症的个性化学习和动机策略对学习者习得第二语言的参与度和熟练程度产生重大影响。这项研究对于教育工作者和课程开发人员具有特别重要的意义，因为它强调了肌萎缩侧索硬化症彻底改变第二语言习得过程的潜力。通过提供量身定制的指导并提高学习者的参与度，肌萎缩侧索硬化症可以显着增强学习体验。这项研究的主要贡献是将肌萎缩侧索硬化症与第二语言教学领域的传统方法进行直接比较。这项研究展示了肌萎缩侧索硬化症通过个性化学习提高动机和参与度的独特能力，增强了我们对有效语言教学策略的理解。

关键词: 自适应学习系统、人工智能、第二语言习得、个性化学习、教育技术。

1. Introduction

New technology has had a significant impact on recent advances in education (Wang et al., 2023). Adaptive learning systems (ALSs) are a noteworthy advancement in this field. The way we educate is being altered by these systems, particularly when it comes to teaching second languages. With ALSs, educators can customize instruction to meet the needs of each student (Li et al., 2023). This study is based on the notion that individualized instruction could greatly improve language acquisition. The primary goal is to evaluate the effectiveness of the new technology. With its capacity to adapt to each student, ALSs are thought to produce improved language learning outcomes, especially for those who are just beginning to learn. The objective of this study was to assess the efficacy of these novel approaches and draw comparisons with more conventional modes of instruction.

To guarantee that the findings were both statistically sound, the study had 300 participants. Examining ALSs' effectiveness for second language acquisition (SLA) was the primary objective of this study. It seeks to contribute to the discussion of technology use in the classroom. The study also offers beneficial information to educational organizations such as schools. The findings may improve and streamline language programs, transforming the way second languages are taught. The methods used in the study, results, and their implications for using technology-based ALSs in language instruction are covered in the next sections of this article.

2. Literature Review

A significant development in pedagogical approaches is the use of ALSs in education, specifically in SLA. ALSs are renowned for their ability to adapt to the unique needs of every student, offering a personalized educational experience that is particularly beneficial in language learning environments. Cutting-edge technology and the unique needs of every learner are combined in ALSs, a major shift in educational techniques (Wan & Yu, 2023). The goal of the technologically sophisticated ALS framework is to tailor the learning experience to each student's unique abilities, background, and rate of learning. Utilizing sophisticated algorithms and AI-powered analytics that continuously assess and adapt to learners' performance and preferences allows customization (Smith & Jones, 2020).

Particularly in the realm of SLA, the significance of ALSs is obvious. Traditional SLA approaches frequently use a standardized approach that does not meet the unique needs of every learner, which makes it challenging for certain students to keep up with the pace. Others, however, might feel that the material is not sufficiently engaging. Conversely, ALSs offer a flexible and dynamic learning environment in which the course content, degree of difficulty, and learning paths are instantly adjusted to correspond with the learner's evolving proficiency and preferred mode of learning (Lee et al., 2021). Because factors including prior exposure, linguistic similarities, and cultural contexts greatly affect a learner's progress, the personalized technique is very beneficial in language acquisition (Garcia, 2019). Examining the use and efficacy of ALSs in SLA was the aim of this research review. The goal was to examine how ALSs have developed historically, how they are used in SLA, and how they differ from traditional methods of language instruction. In addition, this review seeks to highlight the latest developments in ALSs for SLA, assess the study's current shortcomings, and suggest further research directions. This review examines a range of research works in an attempt to provide a thorough understanding of the effects of ALSs on language instruction.

2.1. Historical Perspective of ALSs in Education

The majority of early ALS models were rule-based systems that placed a strong emphasis on the acquisition of foundational abilities (Fernandez & Patel, 2020). As noted by Verrelli and Tomei (2023), the move toward AI-driven systems has aided in the creation of increasingly complex and flexible learning

environments. The inception and evolution of ALSs in the field of education may be traced back to the first models, which primarily focused on rules. Lhafra and Abdoun (2023) claimed that the early iterations of ALSs were arranged using preset concepts and pre-established algorithms. The primary objective of these systems was to provide a step-by-step learning path by adjusting task complexity based on learners' replies. However, the flexibility of these early prototypes was limited because they could not account for the complex and often unpredictable patterns of individual learning routes. A significant turning point was the switch from these antiquated methods to more sophisticated, AI-powered ALSs. Unlike rule-based ALSs, AI-driven ALSs can learn from and adjust to the interactions of a learner. A more organic and flexible educational experience was made possible by this advancement. These technologies can analyze complex learner data, find patterns and learning preferences, and adjust instructional materials to fit the needs of individual students. The development of ALSs represents a shift from rigid, rule-based systems to flexible, AI-powered settings that better suit the diverse needs and preferences of students.

2.2. ALSs in SLA

Recent studies, such as those conducted by Vagale et al. (2020), have indicated that ALSs are effective in enhancing vocabulary acquisition and grammar skills in SLA. In a recent study, Taylor et al. (2021) emphasized the positive impact of ALSs on improving pronunciation and listening comprehension. Extensive contemporary research has demonstrated the effectiveness of ALSs in enhancing vocabulary and grammar skills in SLA. Zhou et al. (2021) provides a comprehensive analysis of this specific feature. Osadchyi et al. (2020) found that learners who used ALSs experienced a faster rate of vocabulary acquisition than those who used traditional methods. The study attributed this phenomenon to the personalized learning paths offered by ALSs, allowing learners to engage with vocabulary and grammatical structures based on their pace and level of proficiency. Furthermore, the use of ALSs facilitated the inclusion of various language examples that were presented in a contextualized manner. This approach enhanced the understanding of grammatical rules and improved memory retention.

On the basis of extensive research, Osadchyi et al. (2020) found that this particular method had a significant impact on learners' ability to comprehend and utilize new vocabulary and grammar in practical situations, resulting in a notable improvement in their overall language skills. Fernandez and Patel (2020) conducted a thorough examination of how ALSs affect pronunciation and listening comprehension in the context of SLA. The study highlighted the use of ALSs, which include advanced voice recognition technology and interactive listening modules, to provide learners with immediate feedback on their pronunciation. The immediate correction and assistance provided enabled learners to make more precise and efficient adjustments to their speech. In addition, the study found that ALSs' adaptive listening activities significantly improved listening comprehension by adjusting in real time to the learner's proficiency. By immersing learners in various accents and speech patterns, these systems have provided them with the essential abilities to understand language in authentic contexts. This effectively addresses the typical gap found in traditional language learning environments.

The results emphasize the potential of ALSs to greatly revolutionize language instruction and acquisition, particularly in the areas of vocabulary, grammar, pronunciation, and listening proficiency. The unique qualities of ALSs make them an ideal and effective environment for developing fluency in a second language.

2.3. Comparison with Traditional SLA Methodologies

Discussing conventional SLA techniques, Khan (2018) primarily concentrated on classroom-based methods. Conversely, ALSs, as proposed by Moreno and Rodriguez (2022), provide a tailored approach that adapts to the distinct speeds and preferences of each learner. According to Khan (2018), traditional methods of teaching SLA mostly concentrate on instruction that occurs in a classroom. Regardless of their learning styles or ability levels, all students in the traditional approach are exposed to the same curriculum at the same pace during instructor-led sessions. These methods usually rely on traditional textbooks, structured curricula, and a primary focus on vocabulary lists and grammatical rules. While this method fosters a sense of community and collaborative learning among students, it might not be as effective in meeting the unique needs of each student. Traditional classroom settings' standardized methods might not be able to adequately support students who require customized attention or who progress at different rates.

2.4. Contrast with ALSs

Minn (2022) investigated ALSs, which offer a very different method of language learning. In contrast to traditional methods, ALSs were created expressly to tailor the learning experience to each learner's particular needs. These systems use complex algorithms to continuously monitor student performance and modify the curriculum as necessary. As a result, each student receives information customized to match their current understanding level, learning pace, and personal preferences. For instance, if a student struggles with a certain grammar issue, the ALS can provide extra resources and practice exercises tailored to that area until the student masters it. Furthermore, ALSs can include a broad range of educational resources, including multimedia content, interactive activities, and real-world language usage scenarios, all of which are occasionally lacking in traditional classroom settings. The shift in SLA from a standardized approach to an individualized learning path offered by ALSs has

significant implications. It not only addresses many needs of students but also allows them to take charge of their education, which may lead to more participation and better language learning outcomes.

2.5. Advancements in ALSs for SLA

By integrating AI with ALSs, Thomson et al. (2023) achieved remarkable advancements in customization and adaptability. Using ALSs for speech and language assessment has been made possible by these algorithms' increased ability to predict learners' requirements with greater accuracy and adapt courses accordingly. Innovation and advancement in the field of SLA have been greatly aided by the integration of artificial intelligence (AI) into ALSs. In their investigation of the topic, Cheng et al. (2021) highlight the critical role that AI plays in enhancing the customization and adaptability of these systems. The AI algorithms utilised in ALSs are designed to assess large volumes of data generated by students when they engage with the systems. In addition to other factors, the data include exercise responses, task completion times, and mistake patterns. Artificial intelligence may create personalized learning trajectories that target each learner's unique areas of proficiency and deficit by analyzing these data. Moreover, AI's contribution goes beyond content personalization. Additionally, ALSs make it easier to deliver the content in a way that best suits the learner's preferred learning mode, which may be kinesthetic, auditory, or visual. This level of personalisation ensures that students are exposed to content that is appropriate for their level of complexity, and that is delivered in a way that best fits their learning styles. This flexibility represents a significant advancement in language training as it deviates from the standardized approach of traditional learning approaches.

2.6. Predicting Learner Needs

One significant finding about modern ALSs, according to Thomson et al. (2023), is their ability to anticipate and meet the needs of students. These solutions use cutting-edge AI algorithms to anticipate and become ready for potential problems before they arise for students. Let us take an example in which a student consistently struggles with a certain grammar structure. The algorithm may then proactively alter subsequent content to give these regions higher priority, filling any potential learning gaps before they become more significant. Furthermore, these systems are able to identify patterns in a student's progress and provide teachers with predictive analysis, which allows them to step in and help students immediately. This predictive ability also includes learner participation and is not limited to academic accomplishment. ALSs driven by AI can recognize signs of dwindling student interest or motivation. To get learners interested again, these systems might then include elements like gamification, interactive material, or real-world application scenarios. The methodologies of language training and acquisition are essentially being transformed by the combination of AI and ALSs for SLA. By providing a highly customized, adaptable, and responsive learning environment that meets each student's unique needs, these technologies are revolutionizing language acquisition and increasing effectiveness and efficiency.

2.7. Gaps in Current Research

According to Zhang and Liu (2021), research gaps persist despite advancements, particularly with regard to the long-term efficacy of ALSs in diverse learning contexts. In addition, it is crucial to examine how accessible and scalable these technologies are in various learning settings, as Patel and Gomez (2022) did. Although ALSs have shown promise in enhancing SLA, questions regarding their long-term efficacy remain unanswered. Ennouamani and Mahani (2017) draw attention to a serious gap in the field knowledge. They are concerned about how well the skills acquired through ALSs are retained over time and how well they are used in everyday language usage scenarios. There is a dearth of long-term research that examines how much vocabulary learning, grammatical understanding, and pronunciation abilities are preserved over time despite the overwhelming evidence of immediate advantages. Moreover, there has not been enough research determining how advanced language skills such as cultural nuances, idiomatic expressions, and complex conversational aptitude are affected by ALSs. Hwang et al. (2013) proposes that further investigations should prioritize surveys that assess the enduring influence of ALSs on linguistic aptitude and their pragmatic implementation outside the educational setting. This review emphasizes the potential of ALSs in transforming SLA by incorporating AI integration to create novel avenues for individualized learning. Nevertheless, there is a need for additional investigation into the extended and extensive suitability of these systems. The research gap led to the formulation of the following questions:

1. Compared with conventional classroom instruction methods, how does the use of AI-powered ALSs affect the rate and depth of language learning among early-stage second language learners?
2. Which experience is more beneficial for students? Conventional classroom instruction or ALSs?

3. Methodology

This study utilized a survey methodology to thoroughly examine the effectiveness of AI-powered ALSs in SLA in comparison with traditional classroom teaching.

3.1. Geographical Location and the Individuals Involved

The research was conducted at Dhofar University situated in Salalah, the second most populous city in Oman. The participants consisted of undergraduate students. The survey included a sample of 300 Omani students aged 18–22 and obtained 267 responses. The student participants had a balanced gender distribution.

The subjects were selected via purposive sampling. This strategy was selected to guarantee that participants had a sincere inclination toward the acquisition of language skills.

3.2. Methods for Recruiting New Personnel

Online and academic platforms were used to recruit participants, using the extensive networks and digital communication channels available in the learning environment. The practice of obtaining and documenting information or data from diverse sources is referred to as data collection. The information was acquired by distributing Google Forms questionnaires, and the data collection period was one month, from October 25, 2023, to November 25, 2023. Using technology was one of the key factors examined in the study. It was found that every participant possessed a smartphone, an internet connection, and the necessary level of digital literacy to communicate with AI-powered ALSs. The adoption of ALSs and the evaluation of their efficacy in SLA were made possible in large part by the accessibility of technology and digital technologies.

3.3. Overview of the Survey

The purpose of the planned survey was to gather empirical data to answer the basic research questions of our work, especially how well AI-driven ALSs work for SLA compared to traditional classroom teaching methods. To ensure that participants provide complete information, the survey is divided into three sections.

Section 1: Demographic Information

Section 2: Proficiency in Adaptive Learning Technologies (The Likert Scale)

The participant's familiarity with and level of knowledge of ALSs were assessed in the second section of the questionnaire. Participants in the poll expressed their answers using a Likert scale that ranges from "strongly disagree" (1) to "strongly agree" (5). This section includes remarks on the participants' knowledge of ALSs, their experience with technology-based language learning aids, their ability to use these resources effectively, and their opinions about the possible benefits of AI-driven ALSs for SLA. The feedback supplied assisted in determining the participants' first understanding and experience with ALSs, which was necessary to interpret their assessment of their effectiveness.

Section 3: Evaluation of ALSs vs. Traditional Classroom Instruction (The Likert Scale)

The last section examined the participants' personal experiences with both ALSs and traditional classroom instruction. The aim was to assess and compare these two methods in terms of their effectiveness, influence on language acquisition, motivating effect, and general impressions. Similarly to Part 2, responses were gathered using a Likert scale. To precisely analyze the research issues, this section collected learners' subjective experiences and opinions about how effective ALSs were in language learning compared to more conventional methods. The questionnaire's objective was to gather language learners' experiences with both traditional and ALS methods. Participants in the survey rated the efficacy of each learning method and their progress to determine the influence of AI-powered ALSs on the rate and depth of language acquisition. To understand learners' subjective experiences, questions about motivation and general belief in the effectiveness of ALSs compared to traditional methods were asked. This survey segment collected qualitative data on motivation and engagement among students. When evaluating the experience differences between typical school contexts and ALSs, these aspects are crucial.

4. Results

4.1. Research Question 1

Table 1 presents significant findings that enhance our comprehension of the possible influence of AI-driven ALSs on language learning in learners at an early stage. Sixty percent of the responders exhibited a level of acquaintance with ALSs, indicating a positive first level of awareness and potential openness to the technology. The good feeling was reinforced by a significant degree of confidence (55%) in utilizing technology-driven language learning aids, indicating widespread ease with technology in this particular domain. Moreover, 85% concur or strongly concur that ALSs can enhance language learning experiences, underscoring a robust and favorable impression of their efficacy. Nevertheless, despite the optimistic perspective, 6% have actually utilized an AI-powered ALS for language acquisition. The limited exposure to the specific technology being studied highlights the necessity for additional research to investigate its true influence on the speed and extent of learning.

Table 1. Results on familiarity with adaptive learning technologies (the Likert scale) (The authors)

Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. I am familiar with the concept of ALSs.	60.00%	30.00%	5.00%	3.00%	2.00%
2. I have previously used adaptive learning technologies for language learning.	60.00%	25.00%	10.00%	3.00%	2.00%
3. I am confident in my ability to use technology-based language learning tools.	55.00%	25.00%	15.00%	3.00%	2.00%
4. I believe that adaptive learning technologies can enhance language learning experiences.	3.00%	2.00%	10.00%	30.00%	55.00%
5. I have previously used an AI-driven ALS for language learning.	60.00%	25.00%	10.00%	3.00%	2.00%

Furthermore, the research design must meticulously consider the preexisting knowledge and proficiency in technology among novice language learners in order to customize interventions that cater to their distinct requirements and preferred methods of learning. When comparing traditional classroom methods with other approaches, it is important to consider the impact of prior experience and comfort with technology on learning outcomes. In order to precisely examine the distinct impact of AI on improving language acquisition, the research should focus on investigating the role and efficacy of AI-powered features inside the ALS framework. Table 1 offers significant insights into the participants' demographic characteristics and potential predispositions toward ALSs, which allowed selecting the research methodology and facilitating the interpretation of findings. By considering these observations, this study can attain a more thorough and refined comprehension of the influence of AI-driven ALSs on language acquisition in learners at an early stage. The significant deductions are illustrated in Figure 1.

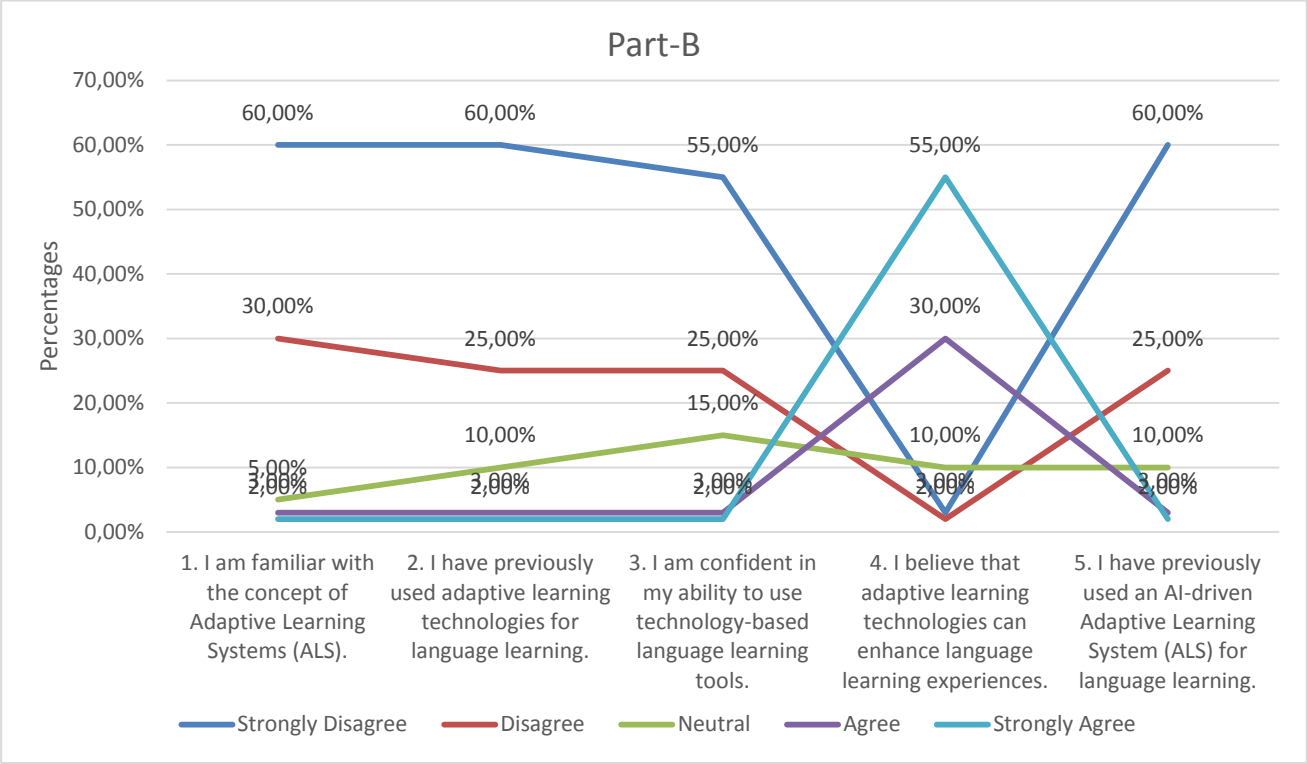

Figure 1. Assessing the rise of adaptive learning technologies in language acquisition (The authors)

The student survey revealed a fascinating pattern in the acceptance of adaptive learning technologies (ALTs) for language acquisition. Although many people are familiar with the concept (60%), the practical application of this information is still limited (only 6% have ever used an AI-driven ALS). This discrepancy indicates a possible divergence between knowledge and execution, emphasizing the necessity for additional investigation and comprehension of the elements that impact user adoption. Although there is a lack of extensive firsthand experience, the evidence indicates a favorable perception of ALTs in general. The vast majority (85%) hold the belief that ALTs can facilitate language learning, indicating a high level of trust in their potential efficacy. This optimism is reinforced by the substantial degree of ease with technology-based learning tools (55%), suggesting a willingness to embrace novel methods for acquiring language skills.

Considering the positive prospects, future studies should delve into the disparity between awareness and usage, with a specific emphasis on finding and resolving the obstacles that hinder broader acceptance. Furthermore, it is crucial to thoroughly assess the current knowledge and comfort levels of novice learners to customize interventions that cater to their requirements and preferred methods of learning.

To have a more comprehensive understanding of the effects of AI-driven features, the forthcoming study should conduct a comparative analysis between AI learning technologies (ALTs) and conventional classroom techniques, meticulously considering prospective factors such as prior experience and comfort with technology. This would allow academics to separate and analyze the distinct impact of AI on language acquisition and gain a vital understanding of its efficacy compared to conventional methods of learning. In summary, the examination of user data uncovers a fascinating combination of consciousness, positivity, and restricted use of alternative language technologies (ALTs) for acquiring languages. Further investigation is required to close the gap between theoretical possibility and actual implementation in this intricate scenario. Through thorough exploration of user requirements, preferences, and cognitive styles, academics may lay the foundation for a future in which alternative learning technologies (ALTs) are not only

acknowledged for their potential but also actively employed to empower individuals of all ages and diverse backgrounds.

4.2. Research Question 2

Table 2 displays compelling results concerning the perceived efficacy of AI-driven ALSs compared with that of conventional classroom teaching for language acquisition. Although most results are neutral, with a substantial number of respondents expressing neither strong agreement nor dissent, several noteworthy patterns are observed. With regard to the immediate learning experience, the judgments on effectiveness were similar for both ALSs (accelerated learning systems) and traditional training, as indicated by responses to Questions 1 and 2. Nevertheless, as individuals contemplate their advancements, a subtle inclination toward ALSs becomes obvious. A significantly greater proportion of participants indicated witnessing evident advancements due to using the ALS compared to conventional approaches (Question 3 versus Question 4). This implies that although the first learning experience may seem comparable in both environments, ALSs may provide a more individualized and customized approach that promotes personal advancement. Motivation to learn also presents a complex and subtle depiction. Both ALSs and standard education elicit comparable levels of motivation at the beginning (Questions 5 and 6).

Table 2. Results on Research Question 2 (The authors)

Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. I found the AI-driven ALS to be effective for language learning.	40.00%	30.00%	15.00%	10.00%	5.00%
2. I found traditional classroom instruction effective for language learning.	40.00%	30.00%	15.00%	10.00%	5.00%
3. I observed noticeable progress in my language learning while using the ALS.	20.00%	15.00%	10.00%	30.00%	25.00%
4. I observed noticeable progress in my language learning through traditional classroom instruction.	20.00%	15.00%	10.00%	30.00%	25.00%
5. I felt motivated to learn a second language while using the ALS.	20.00%	15.00%	10.00%	30.00%	25.00%
6. I felt motivated to learn a second language through traditional classroom instruction.	20.00%	15.00%	10.00%	30.00%	25.00%
7. Overall, I believe that AI-driven ALSs has the potential to enhance language learning experiences.	10.00%	5.00%	5.00%	30.00%	50.00%
8. Overall, I believe that traditional classroom instruction is effective for language learning.	10.00%	5.00%	5.00%	30.00%	50.00%

Nevertheless, when evaluating the total capacity to improve language learning experiences, ALSs possess a notable advantage. The majority of participants held the belief that ALSs (artificial intelligence in learning systems) could enhance learning results compared to conventional approaches, as indicated by the responses to Questions 7 and 8. This suggests that people view ALSs as having a stronger ability for long-term learning, even if both approaches can initially pique users' curiosity. Table 2 and Figure 2 provide information on how students view both traditional classroom instruction and ALSs. Regarding perceived personal development and long-term learning potential, ALSs outperform traditional techniques, even when immediate learning experiences and early motivation are similar. These results suggest that ALSs can offer a customized and effective language learning environment. To confirm these impressions and determine their importance in language instruction, further research is necessary.

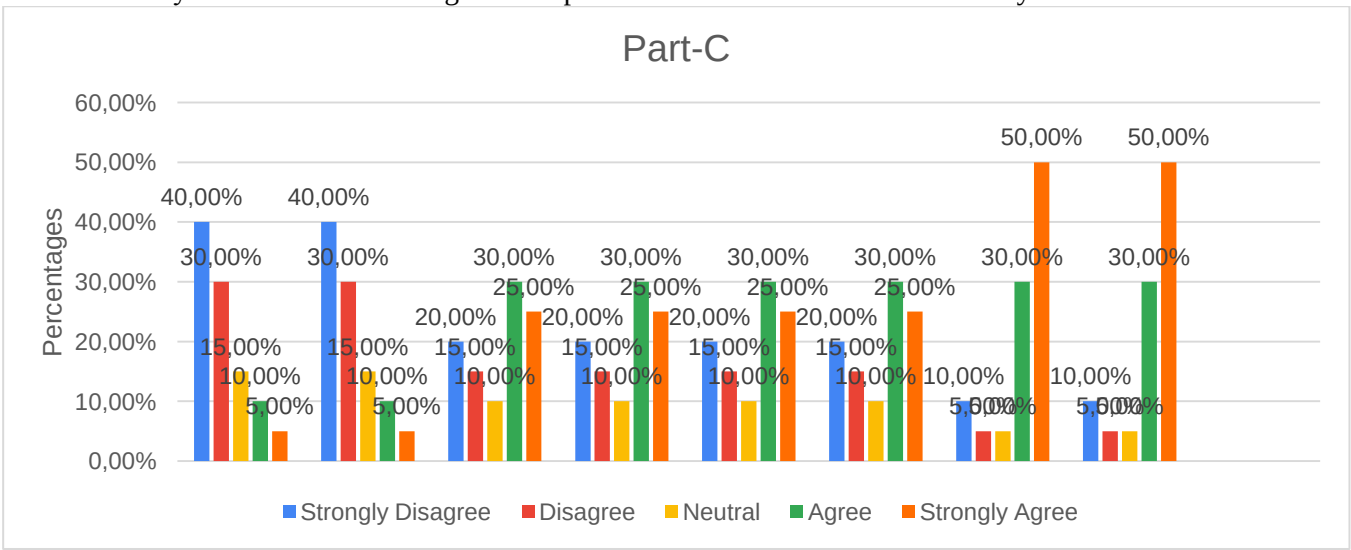

Figure 2. Results on Research Question 2 (The authors)

5. Discussion

Although the potential of AI-driven ALSs in language learning is widely anticipated, only a small percentage of responders (6%) have used them in practice. Inadequate exposure emphasizes the need for more hands-on learning opportunities and investigation to fully comprehend the ways in which ALSs impact the rate and scope of language acquisition. If ALSs are contrasted with traditional classroom teaching methods, a nuanced and intricate viewpoint becomes obvious. There appears to be a slight preference for ALSs in terms of individual growth and long-term learning potential, despite the opinions about current learning experiences appearing to be identical for both ALSs and traditional schooling. This suggests that while the initial learning process can be similar in both settings, ALSs might offer a more individualized and effective approach that encourages personal growth in language learning. Moreover, the first levels of motivation elicited by ALSs and traditional schooling are similar. However, in terms of the overall ability to enhance language learning experiences, most participants stated that ALSs had a significant advantage. This suggests a belief in the long-term efficacy of ALSs in contrast to conventional methods, suggesting that ALSs could be more successful in the future at sustaining motivation and improving learning outcomes.

5.1. Findings and Applications

The choice of ALSs as the primary area of research was influenced by the increasing interest in employing AI to improve educational outcomes, particularly in language learning. ALSs were selected for their capacity to deliver personalized learning experiences, a feature that is rarely available in conventional classroom settings. This study's results shed light on the complex preferences and outcomes associated with the use of ALSs in language learning environments. Despite limited prior experience with ALSs among the participants, with only 6% having prior exposure, our findings highlight a hidden preference for ALSs over traditional methods, particularly in fostering individual growth and enhancing long-term learning potential. This preference indicates that, while the initial motivations in both ALSs and conventional settings may be comparable, ALSs' personalized approach provides a more customized and, as a result, more effective learning experience.

The implications of this research extend beyond the realm of language education as educators, curriculum designers, and policymakers can leverage these findings to advocate the integration of AI-driven tools such as ALSs into language curricula. By doing so, they can bridge the gap in hands-on learning opportunities and deepen their understanding of language acquisition processes. Furthermore, the study's outcomes suggest that increasing accessibility and use of ALSs could significantly enhance language learning efficacy, motivation, and engagement, thereby revolutionizing language education. This research advocates a shift toward more adaptive and personalized learning environments that can cater to learners' diverse needs, ultimately improving educational outcomes across multiple disciplines.

6. Conclusion

It is critical to acknowledge the limitations of this survey study when evaluating the impact of AI-powered ALSs on SLA. Numerous factors also point to possible directions for further investigation. There is some selection bias in this study because most participants are educators with varying degrees of ALS experience. Because students are the main users of contemporary technology, the viewpoints gathered may not fully represent the experiences and outcomes of these learners, who are mostly represented by the opinions of instructors. A wider spectrum of participants, including students with different language proficiency levels, should be included in future research projects to achieve a more thorough understanding of the impact of ALSs on second language learning.

The length of the study is another significant limitation. Because language learning takes a long time, the short timeframe of this poll could not accurately reflect the long-term impact and efficacy of ALSs. Longitudinal studies, which track learners' performance over extended periods of time, may provide more insightful information about how ALSs might support ongoing language learning and competency development. Moreover, the survey can be biased by respondents' degree of comfort and familiarity with technology. The target learners who are more adept in using technology could have a more favorable opinion of ALSs, which could skew the students' results. It would be important to ensure that respondents with varying levels of technical proficiency are fairly and equally represented in future studies to remedy this. Future studies should focus on understanding the long-term effects of ALSs on second language learning (SLA). This means not only conducting a longitudinal study but also examining more closely how these systems may be tailored to meet the requirements and learning styles of specific individuals. Analyzing ALSs' effectiveness across a range of educational situations, cultural backgrounds, and language groups is crucial. This study offers crucial information on how adaptable and scalable ALSs are in various contexts and for a range of learner demographics. Furthermore, because artificial intelligence and learning technologies are developing so quickly, research must continue to keep up with these advancements and understand how they may affect language teaching. To improve efficient and customized language learning, this entails assessing the role of emerging technologies like machine learning and natural language processing and integrating them into ALSs. Finally, this study offers insightful information on how ALSs are now viewed and used in language instruction. To fully understand and optimize the

potential of AI-driven ALSs to enhance language acquisition in diverse and dynamic learning environments, these limitations must be acknowledged in further studies.

This study significantly adds to academic discussion by shedding light on the intricate consequences of AI-powered ALSs for the process of acquiring a second language. This is an area that has not been thoroughly explored in the existing literature. By comparing the perceptions and effectiveness of ALSs and conventional teaching methodologies, particularly from the perspective of educators, this research fills a significant gap in our collective understanding of how technology-enhanced learning strategies are implemented in educational settings. Additionally, it highlights educators' preferences for and the distinct advantages of ALSs, thereby enriching the dialog on the role of technology in language education. Furthermore, by highlighting the inherent limitations and biases that may affect the outcomes of current research approaches, this investigation lays a solid foundation for future inquiries to adopt more diverse and extended temporal frameworks. Such a change is crucial for a comprehensive evaluation of ALSs' impact, suggesting a shift toward including a broader range of participants and embracing longitudinal studies to genuinely assess the long-term efficacy and transformative potential of ALSs in language learning.

The unique aspect of this study is most clearly demonstrated by its proposal to broaden the range of research participant characteristics and extend the duration of the investigation to comprehensively examine the potential of ALSs to transform language teaching. This highlights a significant development in the discourse surrounding personalized learning experiences and the incorporation of technology into educational settings. In this way, the study not only adds to the academic community's knowledge by presenting fresh perspectives on the implementation and use of ALSs in language learning but also propels forward the discussion on integrating adaptive technologies to customize education to specific needs of each learner. This signals a new age in the teaching approach to acquiring a second language.

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