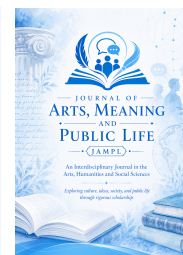
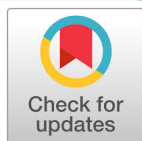


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## Evaluating the Syntax-Somatic Model's Impact on Grammatical Accuracy among Learners of English as a Second Language (ESL)

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### ABSTRACT

This study investigated the impact of the Syntax-Somatic Model (SSM) on grammatical accuracy among learners of English as a Second Language (ESL). It was motivated by the limitations of conventional grammar teaching methods, which often emphasize memorization and repetitive drills without sufficient learner participation or communicative engagement. The SSM, developed by the researchers, integrates syntax instruction with somatic learning activities, including gesture-supported learning, dramatization, role-play, movement-oriented grammar practice, collaborative interaction, and contextual communication. The study adopted a quasi-experimental pretest–posttest non-equivalent control group design. The population comprised adult ESL learners in selected continuing education centers in Lagos, Nigeria, and the sample consisted of 120 participants selected through purposive and simple random sampling techniques. Data were collected with the researchers' Grammatical Accuracy Achievement Test (GAAT), which was validated by experts and yielded a Cronbach's alpha reliability coefficient of 0.82. Data were analyzed using mean, standard deviation, t-test, and ANCOVA at the 0.05 level of significance. Findings showed that the SSM significantly improved grammatical accuracy, retention, learner participation, and communicative confidence. The study concluded that SSM is an innovative and effective framework for adult ESL grammar instruction.

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### 1. INTRODUCTION

The English language plays a vital role in global communication, education, commerce, diplomacy, and technology. In multilingual societies such as Nigeria, English functions as the official language and primary medium of instruction across educational levels, making grammatical competence an essential component

of effective communication. Grammar provides the structural framework through which meaningful expressions are formed and interpreted; without it, learners of English as a Second Language (ESL) face persistent difficulties in speaking, writing, reading comprehension, and academic interaction [Chomsky \(1965\)](#). Language acquisition becomes significantly more effective when learners are exposed to meaningful, experience-based, and engaging learning environments rather than to the rigid memorization of abstract rules [Krashen \(1982\)](#); [Knowles \(1984\)](#). In response to the limitations of teacher-centered, repetitive conventional methods, this study evaluates the Syntax-Somatic Model (SSM), an in-

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structional framework designed to improve grammatical accuracy among adult ESL learners. The model intentionally integrates syntactic instruction, including sentence structure and rule-guided arrangement, with somatic learning, including body-based activities, gestures, role-play, and dramatization, transforming grammar learning into an active, experiential, and cognitively accessible process.

### 1.1. STATEMENT OF THE PROBLEM

Despite the clear communicative necessity of grammatical competence, many adult ESL learners continue to demonstrate weak performance in English usage, frequently struggling with incorrect tense formation, subject–verb disagreement, poor sentence construction, and weak syntactic organization. These persistent grammatical weaknesses heavily undermine learners' communicative confidence and academic progress. This issue is worsened by the fact that traditional grammar instruction in many adult ESL classrooms still relies heavily on repetitive drills, mechanical rule memorization, and isolated exercises that fail to engage mature learners or reflect their unique practical learning needs. While contemporary language pedagogy has increasingly turned toward communicative and learner-centered strategies, there remains a distinct empirical gap regarding the integrated relationship between structured syntax instruction and somatic engagement among adult ESL learners. This study addresses this problem by systematically evaluating the impact of the Syntax-Somatic Model on adult grammatical accuracy and retention.

### 1.2. OBJECTIVES OF THE STUDY

The broad objective of this study is to evaluate the effectiveness of the Syntax-Somatic Model (SSM) on grammatical accuracy among learners of English as a Second Language (ESL). Specifically, the study seeks to:

1. determine the impact of the Syntax-Somatic Model on grammatical accuracy among adult ESL learners;
2. compare the posttest grammatical performance of adult ESL learners taught using the Syntax-Somatic Model against those taught using conventional methods;
3. examine the influence of body-based, somatic learning activities on adult ESL learners' long-term retention of grammatical structures; and
4. investigate adult ESL learners' overall perceptions of the utility of the Syntax-Somatic Model in grammar instruction.

### 1.3. SIGNIFICANCE OF THE STUDY

This study is highly significant because it introduces an innovative pedagogical alternative to the rigid, anxiety-inducing instructional methods that traditionally dominate adult ESL grammar classrooms. By providing empirical validation for the integration of embodied cognition and language education, the findings offer actionable data for language instructors, adult literacy coordinators, and continuing education centers seeking to design interactive, experience-oriented classrooms. Furthermore, this study holds substantial theoretical value by bridging the gap between syntactic consciousness and physical action, advancing current academic conversations surrounding Embodied Cognition Theory and Andragogy within postcolonial second-language frameworks. Finally,

it offers curriculum developers and educational policymakers a tested framework to modernize adult language curricula, making grammar acquisition more functional, participatory, and effective.

### 1.4. RESEARCH QUESTIONS

The following research questions have been formulated to guide the conduct of the study:

1. What impact does the Syntax-Somatic Model have on grammatical accuracy among learners of English as a Second Language (ESL)?
2. Is there a difference in the grammatical performance of adult ESL learners taught using the Syntax-Somatic Model and those taught using conventional teaching methods?
3. How do somatic learning activities influence adult ESL learners' retention of grammatical structures?
4. What are adult ESL learners' perceptions toward the use of the Syntax-Somatic Model in grammar instruction?

### 1.5. RESEARCH HYPOTHESES

The following null hypotheses were tested:

- $H_{01}$  There is no significant impact of the Syntax-Somatic Model on grammatical accuracy among learners of English as a Second Language (ESL).
- $H_{02}$  There is no significant difference in the grammatical performance of adult ESL learners taught using the Syntax-Somatic Model and those taught using conventional teaching methods.
- $H_{03}$  Somatic learning activities have no significant influence on adult ESL learners' retention of grammatical structures.
- $H_{04}$  Adult ESL learners do not have significant positive perceptions toward the use of the Syntax-Somatic Model in grammar instruction.

## 2. THEORETICAL FRAMEWORK

### 2.1. SYNTAX-SOMATIC MODEL

The Syntax-Somatic Model (SSM), developed by Philip Abayomi Olorunfemi and Saleh Mohammed, is an innovative instructional framework designed to improve grammatical accuracy among adult ESL learners through the integration of syntactic consciousness and somatic engagement. The Syntax-Somatic Model derives its foundation from several educational and linguistic theories. One major theory supporting the model is Constructivist Theory, advanced by [Piaget \(1970\)](#) and [Vygotsky \(1978\)](#). Constructivism emphasizes that learners actively construct knowledge through interaction with their social and physical environment. Vygotsky particularly stressed the importance of collaborative learning and social interaction in cognitive development. The Syntax-Somatic Model aligns with constructivist principles because it encourages learners to construct grammatical understanding through experiential activities, interaction, and collaborative participation rather than passive memorization.

The model is also influenced by the principles of Communicative Language Teaching (CLT), developed by scholars such as [Hymes \(1972\)](#) and [Halliday \(1975\)](#). Communicative Language Teaching emphasizes meaningful communication and contextual language use as essential components of language acquisition. [Richards and Rodgers \(2001\)](#) explained that communicative approaches enhance learners' ability to apply grammatical

knowledge within authentic communication contexts. The Syntax-Somatic Model reflects these principles by embedding grammar instruction within role-play, collaborative dialogue, dramatization, and real-life communication activities. Furthermore, the model is rooted in the Theory of Embodied Cognition, which explains that learning occurs through the interaction of body and mind. Embodied cognition theorists argue that physical movement and sensory experiences enhance memory retention, comprehension, and cognitive processing [Wilson \(2002\)](#). This theoretical perspective supports the somatic dimension of the Syntax-Somatic Model, in which learners engage physically with grammatical structures through gestures, movement, and dramatization. Such bodily engagement is expected to strengthen grammatical understanding and long-term retention among ESL learners.

Figure 1 presents the Syntax-Somatic Model.

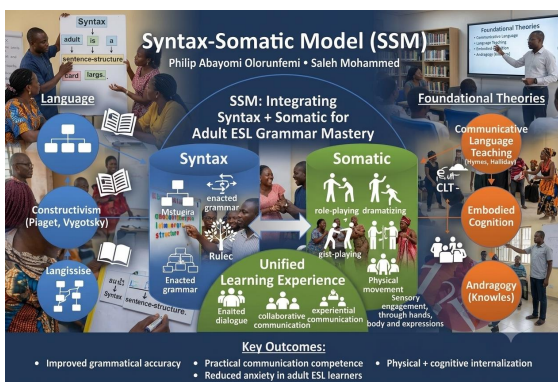


Figure 1. The syntax-somatic model.

The Syntax-Somatic Model is equally influenced by Andragogy Theory, proposed by [Knowles \(1984\)](#). Andragogy emphasizes that adult learners prefer self-directed, practical, and experience-oriented instructional methods. Adult learners are more motivated when learning activities are directly connected to real-life communication needs. Since the Syntax-Somatic Model promotes practical communication and experiential grammar learning, it is considered highly suitable for adult ESL learners who require functional grammatical competence for academic, occupational, and social interaction. It combines two interconnected dimensions of language learning. The first dimension, syntax, focuses on sentence structure, grammatical organization, and rule-guided linguistic arrangement. The second dimension, somatic learning, emphasizes bodily participation, sensory engagement, physical interaction, dramatization, movement, gesture, collaborative performance, and experiential communication. Rather than separating grammatical instruction from communicative practice, the model merges both dimensions into a unified learning experience where grammar becomes physically enacted, socially negotiated, and cognitively internalized.

The emergence of SSM is strongly connected to the weaknesses observed in conventional grammar instruction. In many ESL classrooms, grammar is still taught through repetitive drills, isolated rule memorization, mechanical correction exercises, and teacher-dominated explanations. Such approaches often reduce learner participation, weaken retention, and create anxiety among adult learners. Philip Abayomi Olorunfemi and Saleh Mohammed argued that grammar learning becomes more effective when learners

physically and emotionally interact with grammatical structures through experiential engagement.

## 2.2. CONCEPTUALIZATION

### 2.2.1. Grammatical accuracy

Grammatical accuracy refers to the correct and appropriate use of grammatical structures in spoken and written communication. It involves learners' ability to produce sentences that conform to accepted syntactic, morphological, and structural conventions of the English language. Grammatical accuracy includes proper tense formation, sentence organization, punctuation, subject-verb agreement, article usage, prepositions, pronouns, and word order.

Grammar occupies a central position in second-language acquisition because it provides the structural framework necessary for meaningful communication. [Chomsky \(1965\)](#) explained that grammar represents the generative system through which language users organize and interpret meaning. In ESL contexts, grammatical accuracy contributes significantly to communicative competence, academic success, and professional interaction. Many adult ESL learners continue to experience grammatical difficulties despite years of exposure to English language instruction. These challenges often arise from first-language interference, fossilization of errors, anxiety, inadequate communicative practice, and ineffective teaching methods [Richards and Rodgers \(2014\)](#).

Conventional grammar instruction frequently emphasizes rule memorization without sufficient contextual application, thereby limiting learners' ability to transfer grammatical knowledge into authentic communication. Recent studies have increasingly emphasized contextualized and experiential approaches to grammar instruction. [Xu and Li \(2022\)](#) found that integrated form-focused instruction significantly improved learners' grammatical performance when compared with isolated grammar drills. Similarly, [Sang and Zou \(2022\)](#) observed that collaborative language production enhanced grammatical accuracy and sentence complexity among second-language learners. Within the Syntax-Somatic Model, grammatical accuracy is viewed as both a cognitive and embodied achievement. Learners are expected to internalize grammatical structures through bodily interaction, contextual communication, collaborative performance, and experiential repetition. This perspective broadens grammar learning beyond abstract rules and situates grammatical competence within meaningful communicative action.

### 2.2.2. Adult ESL learners

Adult ESL learners are mature individuals who study English as a second language for academic, professional, occupational, or social purposes. Adult learners differ from younger learners because they possess prior experiences, self-awareness, established learning preferences, and practical communication needs. According to [Knowles et al. \(2014\)](#), adult learners are self-directed individuals who prefer practical, problem-centered, and experience-based learning activities.

Adult ESL learners often face several barriers to grammatical development. These include fossilized language errors, limited opportunities for authentic interaction, fear of embarrassment, cognitive overload, and inadequate learner-centered instruction [Celce-Murcia et al. \(2014\)](#). Many adult learners also struggle to balance language learning with occupational and family re-



sponsibilities. However, adult learners equally possess several strengths that support language acquisition. They often demonstrate stronger analytical reasoning, metacognitive awareness, and goal-oriented learning behavior than younger learners. For this reason, instructional approaches designed for adults should integrate active participation, collaboration, practical communication, and contextualized learning experiences. The Syntax-Somatic Model is particularly suitable for adult ESL learners because it recognizes the experiential nature of adult learning. Through dramatization, gesture-supported instruction, collaborative dialogue, and contextual communication, adult learners are encouraged to connect grammatical learning with real-life communication experiences.

### 2.2.3. Somatic learning activities

Somatic learning activities refer to instructional practices that involve bodily movement, sensory participation, physical interaction, and experiential engagement during learning processes. Somatic learning emphasizes that cognition is deeply connected to bodily experience. In language education, somatic learning activities may include role-play, dramatization, gestures, movement-supported communication, collaborative performance, symbolic body actions, and experiential simulations. Research in embodied cognition has increasingly demonstrated that bodily interaction enhances cognitive processing, comprehension, and memory retention [Wilson \(2002\)](#). In second-language acquisition, gesture-supported instruction has been found to improve vocabulary retention, grammatical comprehension, learner engagement, and communicative confidence [Lamimi \(2025\)](#). Within SSM, somatic learning activities serve as the operational mechanism through which grammatical structures are embodied and internalized. Rather than memorizing grammar passively, learners physically interact with language structures, thereby strengthening cognitive retention and communicative application.

### 2.3. EMPIRICAL REVIEW

Recent empirical studies strongly support embodied and communicative approaches to grammar instruction. [Lamimi \(2025\)](#) investigated embodied pedagogy in EFL grammar instruction and discovered that gesture-based learning significantly improved grammatical mastery and metacognitive awareness among learners. The study concluded that bodily engagement enhances grammatical retention and learner participation. [Hu et al. \(2025\)](#) examined embodied simulation in second-language grammatical processing and found that physical interaction positively influenced learners' comprehension of grammatical aspects and sentence interpretation. Their findings support the embodied assumptions underlying SSM. [Jusslin et al. \(2022\)](#) reviewed embodied learning approaches in language education and reported that embodied instructional practices improve learner engagement, communicative participation, and language retention. The researchers concluded that bodily involvement creates stronger cognitive connections during language learning.

Similarly, [Sang and Zou \(2022\)](#) investigated collaborative production in second-language writing and found that interaction-based learning improved grammatical accuracy and sentence complexity. Their findings support the collaborative dimension of SSM. [Xu and Li \(2022\)](#) also demonstrated that contextualized

grammar instruction produced significantly better grammatical outcomes than isolated grammar drills. This finding aligns with the communicative and contextual assumptions of the Syntax-Somatic Model. Although several studies have explored communicative and embodied instructional practices, limited research has specifically examined the integrated relationship between syntax instruction and somatic engagement among learners of English as a Second Language (ESL). The present study therefore seeks to fill this gap by evaluating the impact of SSM on grammatical accuracy among ESL learners.

## 3. RESEARCH METHODOLOGY

### 3.1. RESEARCH DESIGN

This study adopted a quasi-experimental research design involving pretest–posttest non-equivalent control groups to evaluate the impact of the Syntax-Somatic Model (SSM) on grammatical accuracy among adult ESL learners. The quasi-experimental design was considered appropriate because the study was conducted within a natural classroom setting where complete randomization of participants was not feasible. The design enabled the researchers to compare the grammatical performance of learners exposed to the Syntax-Somatic Model with those taught using the conventional grammar teaching method.

The design also provided an opportunity to determine learners' grammatical performance before and after treatment through the administration of pretest and posttest assessments. The use of the pretest helped to establish the initial grammatical competence of participants, while the posttest measured the effectiveness of the treatment after exposure to the instructional intervention. [Creswell and Creswell \(2023\)](#) explained that quasi-experimental designs are suitable for educational research where intact groups are used to investigate the effectiveness of instructional strategies. The justification for choosing the quasi-experimental design lies in its suitability for classroom-based intervention studies.

### 3.2. AREA OF THE STUDY

The study was conducted in selected adult learning centers and continuing education institutions in Lagos, Nigeria. Lagos State was selected because it is one of the most linguistically diverse and educationally active states in Nigeria, where English serves as the dominant medium of communication in education, business, and public interaction. The choice of Lagos State was also justified by the high concentration of adult learners seeking English language proficiency for academic advancement, occupational development, and social communication. The availability of suitable participants and institutional support therefore made the area appropriate for the study.

### 3.3. POPULATION OF THE STUDY

The population of the study comprised all adult ESL learners enrolled in continuing education and adult literacy programs within selected institutions in Lagos State. The target population included adult learners between the ages of 20 and 50 years who were actively learning English as a second language. Adult ESL learners were selected because the Syntax-Somatic Model was specifically designed to address the communicative and grammatical needs of mature learners. Adult learners possess unique learning characteristics such as prior educational experiences,

practical communication needs, and self-directed learning tendencies. According to Knowles et al. (2014), adults learn more effectively when instructional approaches are participatory, practical, and experience-based. The population was therefore considered suitable for evaluating the effectiveness of the Syntax-Somatic Model.

### 3.4. SAMPLE AND SAMPLING TECHNIQUES

A sample size of 120 adult ESL learners was selected for the study. The participants were drawn from two selected adult learning centers through purposive and simple random sampling techniques. Sixty participants were assigned to the experimental group, while sixty participants were assigned to the control group. Purposive sampling was first used to select institutions that offered organized and structured ESL programs for adult learners. The justification for using purposive sampling was based on the need to select institutions that possessed the specific characteristics required for the study. Since not all learning centers in Lagos State provide formal ESL programs for adults, purposive sampling enabled the researchers to deliberately select institutions relevant to the objectives of the study. Etikan and Bala (2017) explained that purposive sampling is appropriate when researchers intentionally select participants or locations that possess particular qualities necessary for an investigation.

Thereafter, simple random sampling was used to select participants and assign them to experimental and control groups. The use of simple random sampling ensured fairness and reduced selection bias by giving all participants equal chances of being selected. Kumar (2019) argues that random sampling improves objectivity and enhances the representativeness of a sample.

### 3.5. INSTRUMENTATION

The major instrument used for data collection was the Grammatical Accuracy Achievement Test (GAAT), developed by the researchers. The instrument was designed to assess learners' grammatical competence before and after treatment. It consisted of structured objective questions and sentence-construction exercises covering grammatical areas such as tense usage, punctuation, sentence formation, subject-verb agreement, prepositions, grammatical transformation, and word order. The instrument was divided into two sections. Section A collected demographic information such as age, gender, educational background, and language learning experience, while Section B contained the grammar achievement test items. The Grammatical Accuracy Achievement Test was selected because it directly measured the dependent variable of the study, which was grammatical accuracy. Achievement tests are widely used in language education research because they provide objective measures of learners' academic performance and language competence Johnson and Christensen (2024).

#### 3.5.1. Validity of the instrument

To ensure the validity of the instrument, the Grammatical Accuracy Achievement Test was submitted to experts in English Language Education, Applied Linguistics, and Educational Measurement and Evaluation. The experts examined the instrument for relevance, clarity, appropriateness, language suitability, and alignment with the objectives and hypotheses of the study. Their

observations and corrections were incorporated into the final version of the instrument before administration.

#### 3.5.2. Reliability of the instrument

The reliability of the Grammatical Accuracy Achievement Test was determined through a pilot study conducted among twenty adult ESL learners outside the selected study area. The pilot participants possessed characteristics similar to those of the actual study participants. The data obtained from the pilot test were analyzed using Cronbach's alpha reliability statistics. A reliability coefficient of 0.82 was obtained, indicating that the instrument possessed a high level of internal consistency and reliability. Tavakol and Dennick (2011) state that reliability coefficients above 0.70 are considered acceptable for educational research instruments. The pilot testing procedure was justified because it helped the researchers determine the consistency and dependability of the instrument before the actual study.

### 3.6. TREATMENT PROCEDURE

The treatment lasted for eight weeks and was divided into three phases: pretest administration, instructional treatment, and posttest administration. During the first week, both the experimental and control groups were administered the Grammatical Accuracy Achievement Test as a pretest. The purpose of the pretest was to determine the initial grammatical competence of participants before treatment and establish baseline equivalence between the two groups. From the second week to the seventh week, the experimental group was exposed to the Syntax-Somatic Model (SSM). The treatment involved the integration of syntax instruction with somatic learning activities such as gesture-supported grammar learning, role-play, dramatization, collaborative sentence construction, movement-oriented syntax practice, contextual dialogue, and interactive communication tasks. The justification for using the Syntax-Somatic Model was based on its theoretical foundations in constructivism, communicative language teaching, embodied cognition, and adult learning theories. Conversely, the control group was taught using the conventional grammar teaching method involving teacher explanation, textbook exercises, memorization of grammatical rules, repetitive drills, and written exercises. The use of the control group was justified because it provided a basis for comparison and enabled the researchers to determine whether improvements in grammatical accuracy resulted specifically from the Syntax-Somatic Model. During the eighth week, both groups were administered the Grammatical Accuracy Achievement Test again as a posttest.

### 3.7. METHOD OF DATA COLLECTION

The researchers personally administered the instruments with the assistance of trained research assistants. The data-collection process involved the administration of the pretest, implementation of the treatment, administration of the posttest, scoring of learners' responses, and compilation of the data for analysis.

### 3.8. METHOD OF DATA ANALYSIS

The data collected were analyzed using both descriptive and inferential statistical methods. Descriptive statistics such as mean, percentage, and standard deviation were used to summarize learners'

scores and describe patterns of grammatical performance. Inferential statistics, including independent-samples t-test and analysis of covariance (ANCOVA), were used to test the research hypotheses. ANCOVA was specifically employed to control pretest differences between groups and determine the actual effect of the Syntax-Somatic Model on grammatical accuracy among learners of English as a Second Language (ESL). The justification for using ANCOVA was based on its ability to adjust for initial group differences and increase the accuracy of treatment-effect estimation. All hypotheses were tested at the 0.05 level of significance.

#### 4. RESULTS AND DISCUSSION

The presentation of results is organized according to the research questions and hypotheses formulated for the study.

##### 4.1. DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

Table 1 presents the gender distribution of the respondents involved in the study.

**Table 1. Distribution of respondents by gender.**

| Gender | Frequency | Percentage |
|--------|-----------|------------|
| Male   | 58        | 48.3%      |
| Female | 62        | 51.7%      |
| Total  | 120       | 100%       |

Source: Field work, 2026.

Table 1 indicates that 58 participants, representing 48.3% of the total sample, were male, while 62 participants, representing 51.7%, were female. The slight difference between the number of male and female participants suggests that both genders were adequately represented in the study. The balanced representation of participants enhanced the reliability and fairness of the findings because the study was not dominated by a particular gender group. The inclusion of both male and female adult ESL learners was important because grammatical learning and participation in embodied instructional activities may vary across individuals. The balanced distribution therefore improved the generalizability of the findings to adult ESL learners irrespective of gender differences.

Table 2 reveals the age distribution of the participants involved in the study.

**Table 2. Distribution of respondents by age.**

| Age Range   | Frequency | Percentage |
|-------------|-----------|------------|
| 20–29 years | 38        | 31.7%      |
| 30–39 years | 46        | 38.3%      |
| 40–50 years | 36        | 30.0%      |
| Total       | 120       | 100%       |

Source: Field work, 2026.

The result in Table 2 indicates that participants between the ages of 30 and 39 years constituted the highest percentage with 38.3%, followed by participants between 20 and 29 years, representing 31.7%, while participants between 40 and 50 years represented 30.0% of the sample. The result suggests that most adult ESL

learners in the selected institutions belonged to middle adulthood. This finding may be associated with the increasing need for English language competence among working-class adults seeking educational advancement, professional development, occupational mobility, and improved communication skills. The broad age distribution further strengthened the credibility of the findings because the Syntax-Somatic Model was tested across different adult age categories rather than within a narrow age group. This implies that the effectiveness of the model may extend across diverse adult learner populations.

##### 4.2. RESEARCH QUESTION ONE

Research Question One asked: What impact does the Syntax-Somatic Model have on grammatical accuracy among learners of English as a Second Language (ESL)? Table 3 presents the mean scores obtained by the experimental and control groups before and after treatment.

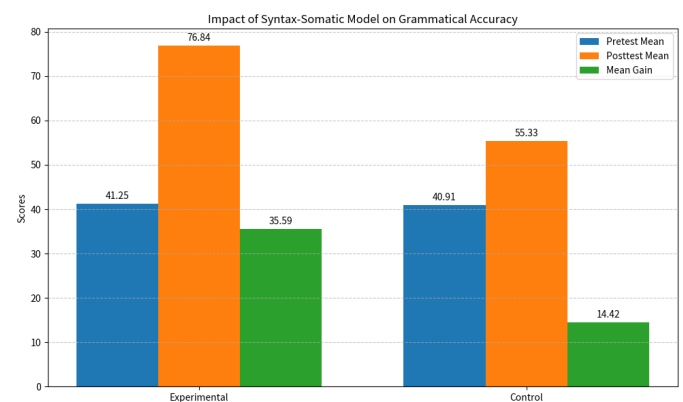
**Table 3. Impact of the Syntax-Somatic Model on Grammatical Accuracy among Adult ESL Learners in Pretest and Posttest Assessment**

| Group              | N  | Pretest Mean | Posttest Mean | Mean Gain |
|--------------------|----|--------------|---------------|-----------|
| Experimental Group | 60 | 41.25        | 76.84         | 35.59     |
| Control Group      | 60 | 40.91        | 55.33         | 14.42     |

Source: Field work, 2026.

The result in Table 3 indicates that the experimental group exposed to the Syntax-Somatic Model recorded a pretest mean score of 41.25 and a posttest mean score of 76.84, resulting in a mean gain of 35.59. In contrast, the control group taught using the conventional teaching method recorded a pretest mean score of 40.91 and a posttest mean score of 55.33, resulting in a mean gain of 14.42. The similarity between the pretest scores of both groups suggests that the participants possessed relatively equal grammatical competence before the treatment commenced. This established baseline equivalence between the experimental and control groups and strengthened the validity of the treatment effect observed after the intervention.

Figure 2 illustrates the impact of the Syntax-Somatic Model on grammatical accuracy.



**Figure 2. Impact of the Syntax-Somatic Model on Grammatical Accuracy.**

The substantial increase in the posttest mean score of the experimental group indicates that the Syntax-Somatic Model exerted



a strong positive influence on learners' grammatical accuracy. The difference between the mean gain scores of the two groups further demonstrates that learners exposed to embodied and communicative grammar instruction performed significantly better than those taught using conventional methods. The result implies that the integration of syntax instruction with bodily engagement, role-play, dramatization, contextual communication, and collaborative interaction enhanced learners' understanding and retention of grammatical structures. Through repeated experiential interaction with grammatical forms, learners were able to internalize syntactic patterns more effectively than learners exposed to mechanical grammar drills. The finding also suggests that grammar learning becomes more effective when learners participate actively in the learning process rather than memorizing isolated grammatical rules. The embodied and participatory nature of the Syntax-Somatic Model therefore contributed significantly to learners' grammatical improvement.

#### 4.2.1. Test of hypothesis one

The first null hypothesis stated that there is no significant impact of the Syntax-Somatic Model on grammatical accuracy among learners of English as a Second Language (ESL). Table 4 shows the independent-samples t-test analysis conducted to test this hypothesis.

**Table 4. Test of hypothesis on the impact of the syntax-somatic model on grammatical accuracy among learners of english as a second language (ESL).**

| Group        | N  | Mean  | SD   | t-value | p-value | Decision          |
|--------------|----|-------|------|---------|---------|-------------------|
| Experimental | 60 | 76.84 | 8.42 | 9.84    | <0.001  | $H_{01}$ rejected |
| Control      | 60 | 55.33 | 9.11 |         |         |                   |

Source: Field work, 2026. Level of significance = 0.05.

The result in Table 4 revealed that the experimental group exposed to the Syntax-Somatic Model obtained a mean score of 76.84 with a standard deviation of 8.42, while the control group taught using the conventional grammar teaching method obtained a mean score of 55.33 with a standard deviation of 9.11. The calculated t-value of 9.84 with a corresponding p-value of less than 0.001 was obtained. Since the p-value is less than the 0.05 level of significance, the null hypothesis was rejected. This indicates that the Syntax-Somatic Model had a statistically significant impact on grammatical accuracy among learners of English as a Second Language (ESL). The result implies that learners exposed to embodied and communicative grammar instruction performed significantly better than learners exposed to traditional grammar teaching methods. The substantial difference between the mean scores of both groups demonstrates that the Syntax-Somatic Model enhanced learners' grammatical competence, retention, and application of grammatical structures.

#### 4.3. RESEARCH QUESTION TWO

Research Question Two asked: Is there a difference in the grammatical performance of adult ESL learners taught using the Syntax-Somatic Model and those taught using conventional teaching methods? Table 5 reveals the posttest performance of adult ESL learners taught using the Syntax-Somatic Model and those taught using conventional grammar teaching methods.

**Table 5. Difference in posttest grammatical performance of adult ESL learners.**

| Group         | Mean Score | Standard Deviation |
|---------------|------------|--------------------|
| Experimental  | 76.84      | 8.42               |
| Control Group | 55.33      | 9.11               |

Source: Field work, 2026.

The result in Table 5 shows that learners in the experimental group obtained a mean score of 76.84 with a standard deviation of 8.42, while learners in the control group obtained a mean score of 55.33 with a standard deviation of 9.11. The higher mean score recorded by the experimental group indicates that the Syntax-Somatic Model was more effective in improving grammatical accuracy than the conventional teaching method. The relatively lower standard deviation observed within the experimental group further suggests consistency in learners' performance after exposure to the treatment. This finding implies that embodied instructional activities such as gesture-supported learning, dramatization, movement-oriented syntax practice, collaborative sentence construction, and contextual communication enhanced learners' grammatical understanding across different ability levels. The result also suggests that conventional grammar teaching methods characterized by rote memorization, teacher explanation, and repetitive drills may not adequately address the communicative and experiential learning needs of adult ESL learners. In contrast, the Syntax-Somatic Model created an interactive learning environment where grammar was practiced within meaningful communication contexts.

#### 4.3.1. Test of hypothesis two

The second null hypothesis stated that there is no significant difference in the grammatical performance of adult ESL learners taught using the Syntax-Somatic Model and those taught using conventional teaching methods. Table 6 presents the ANCOVA result.

The ANCOVA result presented in Table 6 was used to determine whether a significant difference existed between the grammatical performance of learners exposed to the Syntax-Somatic Model and those taught using conventional grammar teaching methods. The result revealed an F-value of 18.42 with a corresponding p-value of less than 0.001. Since the p-value obtained was less than the 0.05 level of significance, the null hypothesis was rejected. This indicates that a statistically significant difference existed between the grammatical performance of learners taught using the Syntax-Somatic Model and those taught using conventional instructional methods. The finding demonstrates that the Syntax-Somatic Model was significantly more effective than conventional grammar instruction in improving grammatical accuracy among learners of English as a Second Language (ESL). The result further indicates that embodied and experiential grammar instruction contributed positively to learners' understanding and application of grammatical structures.

#### 4.4. RESEARCH QUESTION THREE

Research Question Three asked: How do somatic learning activities influence adult ESL learners' retention of grammatical

**Table 6. ANCOVA test of the difference in grammatical performance of adult ESL learners.**

| Source of Variation | Sum of Squares | df  | Mean Square | F-value | p-value | Decision          |
|---------------------|----------------|-----|-------------|---------|---------|-------------------|
| Between Groups      | 4218.52        | 1   | 4218.52     | 18.42   | <0.001  | $H_{02}$ rejected |
| Within Groups       | 26780.44       | 117 | 228.89      |         |         |                   |
| Total               | 30998.96       | 118 |             |         |         |                   |

Source: Field work, 2026. Level of significance = 0.05.

structures? Table 7 presents learners' responses regarding the influence of somatic learning activities on grammatical retention.

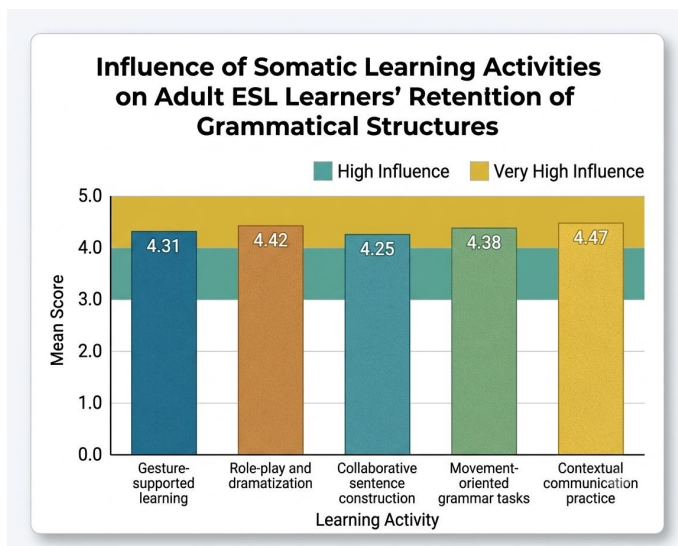
**Table 7. Influence of somatic learning activities on adult ESL learners' retention of grammatical structures.**

| Variable                            | Mean | Interpretation      |
|-------------------------------------|------|---------------------|
| Gesture-supported learning          | 4.31 | High influence      |
| Role-play and dramatization         | 4.42 | High influence      |
| Collaborative sentence construction | 4.25 | High influence      |
| Movement-oriented grammar tasks     | 4.38 | High influence      |
| Contextual communication practice   | 4.47 | Very high influence |

Source: Field work, 2026.

The result in Table 7 indicates that all somatic instructional activities exerted high positive influence on learners' retention of grammatical structures. Contextual communication practice recorded the highest mean score of 4.47, followed by role-play and dramatization with 4.42, movement-oriented grammar tasks with 4.38, gesture-supported learning with 4.31, and collaborative sentence construction with 4.25. The high mean ratings across all variables suggest that learners perceived bodily engagement and experiential interaction as important contributors to grammar retention.

Figure 3 illustrates the influence of somatic learning activities on adult ESL learners' retention of grammatical structures.

**Figure 3. Influence of Somatic Learning Activities on Adult ESL Learners' Retention of Grammatical Structures.**

The result implies that learners retained grammatical structures more effectively when grammar instruction was integrated

into meaningful communication and physical interaction. The finding further indicates that contextual communication activities enhanced learners' ability to apply grammatical structures within real-life communication situations. Through dramatization, dialogue, movement, and collaborative tasks, learners repeatedly practiced grammatical forms within authentic contexts, thereby strengthening memory retention and grammatical awareness. The result equally demonstrates that embodied learning strategies contributed to deeper cognitive processing of grammatical structures. Bodily participation appeared to reinforce learners' understanding by connecting physical movement with linguistic meaning.

#### 4.4.1. Test of hypothesis three

The third null hypothesis stated that somatic learning activities have no significant influence on adult ESL learners' retention of grammatical structures. Table 8 presents the regression analysis conducted to test this hypothesis.

**Table 8. Regression Test of the Influence of Somatic Learning Activities on Adult ESL Learners' Retention of Grammatical Structures**

| Variable                    | Beta Value | t-value | p-value | Decision          |
|-----------------------------|------------|---------|---------|-------------------|
| Somatic learning activities | 0.71       | 10.63   | <0.001  | $H_{03}$ rejected |

Source: Field work, 2026. Level of significance = 0.05.

The regression analysis in Table 8 revealed a beta value of 0.71 with a t-value of 10.63 and a corresponding p-value of less than 0.001. Since the p-value is less than the 0.05 level of significance, the null hypothesis was rejected. This indicates that somatic learning activities exerted a statistically significant influence on learners' retention of grammatical structures. The high beta value obtained suggests that bodily engagement activities such as gestures, dramatization, collaborative sentence construction, role-play, movement-oriented grammar practice, and contextual communication strongly contributed to learners' grammatical retention. The finding implies that grammar learning becomes more effective when learners physically interact with grammatical structures rather than memorizing isolated rules passively. Through bodily movement and contextual communication, learners repeatedly practiced grammatical forms within meaningful learning situations, thereby strengthening memory retention and grammatical awareness.

#### 4.5. RESEARCH QUESTION FOUR

Research Question Four asked: What are adult ESL learners' perceptions toward the use of the Syntax-Somatic Model in grammar instruction? Table 9 reveals learners' perceptions toward the use of the Syntax-Somatic Model in grammar instruction.

The result in Table 9 indicates that adult ESL learners possessed



**Table 9. Adult ESL Learners' Perceptions toward the Use of the Syntax-Somatic Model in Grammar Instruction**

| Response Category                  | Mean Score | Interpretation |
|------------------------------------|------------|----------------|
| Learner participation              | 4.53       | Very positive  |
| Motivation toward grammar learning | 4.49       | Very positive  |
| Confidence in English usage        | 4.35       | Positive       |
| Grammar retention                  | 4.41       | Positive       |
| Communication improvement          | 4.56       | Very positive  |

Source: Field work, 2026.

highly positive perceptions toward the instructional approach. Communication improvement recorded the highest mean score of 4.56, followed by learner participation with 4.53, motivation toward grammar learning with 4.49, grammar retention with 4.41, and confidence in English usage with 4.35.

Figure 4 presents adult ESL learners' perceptions toward the use of the Syntax-Somatic Model in grammar instruction.

The finding suggests that the Syntax-Somatic Model created an engaging, interactive, and motivating learning environment capable of reducing grammar anxiety and improving learner participation. Adult learners appeared to enjoy grammar instruction more when grammatical concepts were integrated into physical interaction and communicative practice. The result further indicates that the model improved learners' communicative confidence and willingness to participate in English language interaction. The embodied and collaborative nature of the instructional activities may have reduced fear of grammatical mistakes and encouraged learners to communicate more freely. The finding equally suggests that the Syntax-Somatic Model transformed grammar learning from a rigid and abstract process into a practical and experiential activity. Consequently, learners developed positive attitudes toward grammar instruction and communicative engagement.

#### 4.5.1. Test of hypothesis four

The fourth null hypothesis stated that adult ESL learners do not have significant positive perceptions toward the use of the Syntax-Somatic Model in grammar instruction. Table 10 presents the one-sample t-test analysis conducted to test this hypothesis.

**Table 10. One-Sample t-test of Adult ESL Learners' Perceptions toward the Use of the Syntax-Somatic Model in Grammar Instruction**

| Variable             | Mean | SD   | t-value | p-value | Decision          |
|----------------------|------|------|---------|---------|-------------------|
| Learners' perception | 4.47 | 0.61 | 11.26   | <0.001  | $H_{04}$ rejected |

Source: Field Work, 2026. Level of significance = 0.05.

Table 10 revealed a mean score of 4.47 with a standard deviation of 0.61. A t-value of 11.26 and a corresponding p-value of less than 0.001 were obtained. Since the p-value obtained was less than the 0.05 significance level, the null hypothesis was rejected. This indicates that adult ESL learners possessed significantly positive perceptions toward the use of the Syntax-Somatic Model in grammar instruction. The finding suggests that learners viewed the Syntax-Somatic Model as an engaging, motivating, participatory, and effective instructional approach. Learners reported increased communication confidence, improved grammatical understanding, enhanced participation, and stronger motivation to-

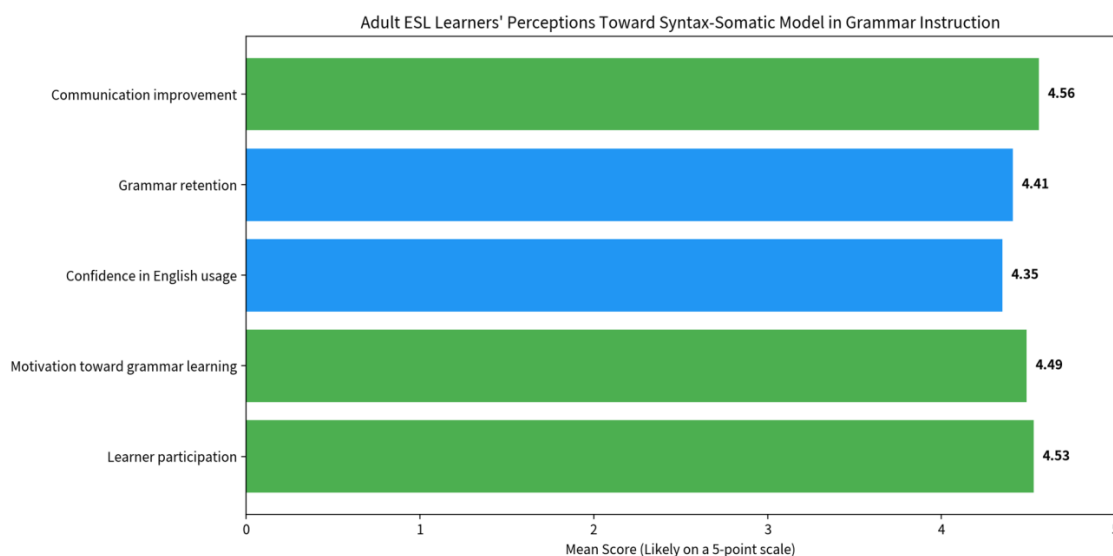
ward grammar learning during the treatment period. The positive perceptions observed among learners may be attributed to the interactive and learner-centered nature of the model. Unlike traditional grammar teaching methods that often create anxiety and passive learning conditions, SSM transformed grammar learning into a practical and collaborative communicative experience.

#### 4.6. DISCUSSION OF FINDINGS

The findings of the study revealed that the Syntax-Somatic Model significantly improved grammatical accuracy among learners of English as a Second Language (ESL). Learners exposed to the model recorded substantially higher posttest scores and mean gain scores than learners taught using the conventional grammar teaching method. This finding confirms the central assumption of the Syntax-Somatic Model that grammatical competence develops more effectively when learners engage cognitively, physically, emotionally, and socially during instruction. The finding agrees with Lamimi (2025), who investigated embodied pedagogy in grammar instruction and found that gesture-supported learning significantly improved learners' grammatical mastery and metacognitive awareness. Lamimi concluded that bodily engagement strengthens learners' retention and understanding of grammatical structures. The present finding similarly demonstrates that learners exposed to movement-oriented grammar instruction achieved higher grammatical performance than learners exposed to conventional instructional methods. The result also supports the study conducted by Hu et al. (2025), who examined embodied simulation in second-language grammatical processing among adult learners. Their findings revealed that bodily interaction enhanced learners' grammatical comprehension and sentence interpretation. The researchers argued that physical engagement strengthens cognitive processing during language acquisition. This aligns with the findings of the present study, where role-play, dramatization, movement, and contextual communication improved grammatical retention among learners of English as a Second Language (ESL).

Furthermore, the findings are consistent with Jusslin et al. (2022), whose systematic review of embodied learning approaches in language education revealed that embodied instructional practices significantly improve learner engagement, language retention, participation, and communicative competence. The present study similarly demonstrated that learners exposed to SSM developed stronger grammatical competence and more positive attitudes toward grammar learning. The study also revealed that somatic learning activities significantly influenced learners' retention of grammatical structures. This finding corroborates the theory of embodied cognition Wilson (2002), which explains that cognition is deeply connected to bodily interaction and sensory experience. According to embodied cognition theory, physical engagement enhances comprehension, memory retention, and cognitive processing. The findings of the present study validate this theoretical assumption because learners retained grammatical structures more effectively when grammar instruction involved bodily participation and communicative interaction.

The positive perceptions expressed by learners toward the Syntax-Somatic Model further support the principles of adult learning theory proposed by Knowles (1984). Knowles emphasized that adult learners learn more effectively when instructional



**Figure 4.** Adult ESL learners' perceptions toward the use of the syntax-somatic model in grammar instruction.

activities are participatory, practical, collaborative, and connected to real-life experiences. The present study revealed that learners became more motivated, confident, and communicatively active when grammar learning was contextualized through experiential activities. The superiority of the Syntax-Somatic Model over conventional grammar teaching methods was clearly evident throughout the findings of the study. Unlike traditional approaches that rely heavily on rule memorization and repetitive drills, SSM integrated syntax instruction with bodily engagement, contextual communication, collaboration, and experiential learning. This holistic instructional structure enabled learners to construct grammatical understanding actively rather than receiving grammatical knowledge passively. The findings therefore demonstrate that grammar learning among ESL learners becomes more effective when instruction combines cognitive engagement with physical interaction and communicative participation. The Syntax-Somatic Model consequently represents an innovative and transformative instructional framework capable of improving grammatical accuracy, learner motivation, communicative competence, and grammar retention among learners of English as a Second Language (ESL).

## 5. CONCLUSION

This study evaluated the impact of the Syntax-Somatic Model (SSM) on grammatical accuracy among adult learners of English as a Second Language (ESL). The study emerged from the persistent challenges associated with conventional grammar teaching methods, which often emphasize memorization, repetitive drills, and teacher-centered instruction without sufficient learner participation and communicative engagement. In response to these limitations, the Syntax-Somatic Model introduced an innovative instructional framework that integrates syntax instruction with somatic learning activities such as gesture-supported learning, dramatization, role-play, collaborative interaction, movement-oriented grammar practice, and contextual communication. The findings of the study revealed that the Syntax-Somatic Model significantly improved grammatical accuracy among learners of

English as a Second Language (ESL). Learners exposed to the model performed substantially better than learners taught using conventional grammar teaching methods. The study further revealed that somatic learning activities positively influenced learners' retention of grammatical structures, communicative participation, grammatical confidence, and motivation toward grammar learning. The embodied and participatory nature of the Syntax-Somatic Model enabled learners to internalize grammar through practical communication experiences rather than through isolated memorization of rules.

The study also established that adult ESL learners possessed highly positive perceptions toward the use of the Syntax-Somatic Model. Learners viewed the instructional approach as interactive, motivating, practical, communicative, and learner-centered. This suggests that embodied grammar instruction can reduce grammar anxiety and create a more engaging learning environment for adult learners. The study further validated the assumptions of constructivist theory, communicative language teaching theory, embodied cognition theory, and adult learning theory upon which the Syntax-Somatic Model was developed. Overall, the study concludes that the Syntax-Somatic Model represents an innovative, transformative, and effective pedagogical framework for improving grammatical accuracy among learners of English as a Second Language (ESL). The model therefore possesses strong instructional potential for language education, adult literacy programs, continuing education centers, and second-language learning environments within Nigeria and beyond.

### 5.1. RECOMMENDATIONS

Based on the findings of this study, the following recommendations were made:

1. English language teachers should integrate embodied and participatory instructional strategies such as gesture-supported learning, dramatization, role-play, and collaborative communication into grammar instruction to improve grammatical accuracy among learners of English as a Second Language (ESL).

- Curriculum developers should incorporate the Syntax-Somatic Model into adult language education curricula in order to promote learner-centered and experiential grammar instruction.
- Teacher training institutions should organize workshops, seminars, and professional-development programs to train language educators on the effective implementation of the Syntax-Somatic Model in ESL classrooms.
- Adult learning centers and continuing education institutions should create interactive learning environments that encourage bodily engagement, contextual communication, and collaborative learning during grammar instruction.
- Educational policymakers should support innovative language teaching approaches capable of improving communicative competence, grammatical retention, and learner participation among learners of English as a Second Language (ESL).
- Researchers should conduct further studies on the Syntax-Somatic Model using larger populations, different educational settings, and other language skills such as speaking, writing, listening, and reading comprehension.
- Future studies should investigate the long-term effects of embodied grammar instruction on language retention, communicative competence, and second-language fluency among diverse learner populations.
- Technology-assisted versions of the Syntax-Somatic Model should be developed to support digital and virtual language learning environments.

#### DATA AVAILABILITY

Data will be available upon reasonable request from the corresponding author.

#### CONFLICT OF INTEREST

The researchers declare that there was no conflict of interest regarding the conduct, analysis, interpretation, and publication of this study. The study was conducted solely for academic and research purposes without external financial influence or personal bias capable of affecting the findings of the research.

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#### ETHICAL CONSIDERATIONS

Ethical standards were strictly observed throughout the study. Participants were informed about the objectives and procedures of the research before participation. Participation was voluntary, and informed consent was obtained from all participants. The researchers assured participants that their responses would remain confidential and would be used strictly for academic purposes. Therefore, the images used in the model as displayed in Figure 1 are purely imaginary constructs.

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