The Impact of Limbic Synchrony Strategy on Developing EFL Speaking Skills in Libyan Primary Schools: A Quantitative Study

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Abstract

The present study investigates the impact of Limbic Synchrophony as a teaching strategy on English as a Foreign Language (EFL) speaking instruction in Libyan elementary schools, where learners often experience limited exposure to English, high speaking anxiety, fear, and low communicative confidence. Focusing on Grade 4 classrooms, the study adopts a quantitative research design (i.e., a quasi-experimental pre-test/post-test design was employed) to examine whether emotionally attuned teaching practices contribute to improve learners' speaking performance and reduced their anxiety compared to traditional instruction methods. By integrating insights from affective neuroscience and language pedagogy, this study aims to provide empirical evidence for the role of emotional synchronization in facilitating oral language development and improving EFL teaching practices within the Libyan educational context. The findings provide empirical evidence that emotional teacher-learners connectedness represents crucial issue that facilitate EFL speaking acquisition and progress.

Key words: Limbic Synchrophony, education, speaking English, communication, anxiety, timidity, confidence.

المستخلص:

تتناول هذه الدراسة تأثير التزامن العاطفي (Limbic Synchrophony) على تدريس مهارة المحادثة في اللغة الإنجليزية كلغة أجنبية (EFL) في المدارس الابتدائية الليبية ، حيث يواجه التلاميذ غالبًا محدودية التعرض للغة الإنجليزية ، وارتفاع مستوى القلق المرتبط بالتحدث ، وانخفاض الثقة التواصلية . تسعى هذه الدراسة – بشكل عام - إلى تقديم أدلة تجريبية حول دور التزامن العاطفي بين المعلم و التلميذ في تنمية مهارات اللغة الشفهية وتحسين ممارسات تدريس اللغة الإنجليزية في بيئة التعليم الليبي . و قد أظهرت النتائج أدلة تجريبية تفيد بأن التواصل العاطفي بين المعلم والمتعلمين يمثل عاملا ذا أهمية بالغة يسهم في تسهيل اكتساب و تنمية مهارات التحدث باللغة الإنجليزية كلغة أجنبية. وتركز الدراسة على الصف الرابع من مرحلة التعليم الأساسي بهدف استقصاء ما إذا كانت أساليب التدريس القائمة على التوافق العضوي تسهم في تحسين أداء التحدث لدى التلاميذ وتقليل مستويات القلق النفسي مقارنة بأساليب التدريس التقليدية.من خلال دمج معطيات علم الأعصاب العاطفي ونظريات تعليم اللغة .

الكلمات المفتاحية: التزامن العاطفي ، التعليم ، التحدث باللغة الإنجليزية ، التواصل ، القلق ، الخجل ، الثقة بالنفس.

Introduction

In its pure sense, the term ‘Limbic Synchrophony’ refers to the emotional alignment or resonance between people whereby their emotional responses and internal states become synchronized through social interaction. According to Lewis, Amini, and Lannon (2000), the principal psychological features of Limbic Synchrophony include emotional attunement between individuals who share affective nonverbal communication (facial expressions, tone, gestures) to build up mutual regulation of emotions.

Within educational context, Limbic Synchrophony is fast becoming an important issue based on its major principles which emphasize the emotional alignment between teachers and learners and its positive impact on learning outcomes. Rooted in interpersonal neurobiology, the concept suggests that emotional states can become synchronized through social interaction, allowing teachers to influence students’ emotional regulation, motivation, and engagement (Lewis et al., 2000; Immordino-Yang, and Damasio, 2007; Siegel, 2012). When teachers

demonstrate empathy, warmth, and emotional responsiveness, they help create a psychologically safe learning environment that reduces anxiety and enhances participation. This emotional attunement supports cognitive processes such as attention, memory, and problem-solving, as positive affective states facilitate deeper learning.

Furthermore, in language learning environments, particularly EFL classrooms, Limbic Synchrophony may lower learners' anxiety, encouraging oral communication, increasing confidence, and improving fluency. These teaching practices were extensively emphasized by Krashen (1982) who proposed that learners' anxiety, timidity, fear are likely to decrease learning motivation. Therefore, integrating emotionally responsive teaching practices can strengthen teacher–student relationships and promote more effective and meaningful learning experiences. Learners may unconsciously mirror these emotional cues once their teacher displays warmth and calm confidence. Such a shared emotional state increases effective participation.

In Libyan elementary schools, English is introduced as a foreign language with limited exposure beyond the classroom. Speaking instruction at this level often prioritizes memorization and repetition, while learners experience anxiety, low confidence, and reluctance to speak. Given the developmental sensitivity of young learners to emotional cues, affective classroom conditions play a decisive role in shaping oral language development. As a consequence, this synchronization emerges through supportive teacher behaviour, positive emotional modelling, and affect-sensitive feedback. This study quantitatively examines the impact of Limbic Synchrophony on EFL speaking outcomes in Libyan elementary classrooms (Grade 4). The researcher presumed that Grade 4 learners who are exposed to emotionally attuned instruction demonstrate a statistically significant reduction in speaking anxiety compared to learners receiving traditional instruction. Such an assumption was based on the fact that emotional attunement in speaking instruction has a positive effect on learners'

communicative confidence and reinforces their classroom oral participation.

Literature Review

During the last forty years, there has been an increasing attention directed to investigate the role of emotional and affective factors in foreign language learning. In that, a considerable amount of literature has been published on the relationship between Limbic Synchrophony and FL learning progress. Such a linguistic interest reflected the shift from behaviourist models toward cognitive-social perspectives that view learning as an integrated human process involving both cognitive and affective dimensions. Within this context, the concept of Limbic Sychrophony emerged to indicate the state emotional aligned interactions of teachers and learners thereby contributing to the creation of supportive and motivating learning environments.

A copious body of research on the topic (Vygotsky,1978; Bandura, 1986; Hove, and Risen, 2009; Koole, and Tschacher, 2016) has showed that learning best occurs through social interaction involving observation, modelling, and self-regulation, where empathy and emotional communication play a central role in building mutual trust between teacher and learner. Besides, it has been assumed that the importance of social interaction in knowledge construction is undeniable because teachers provide both emotional and cognitive scaffolding within the learners' needs and interests.

Of course, this theoretical perspective intersects with the concept of 'Limbic Synchronicity'. First, teacher's emotional interaction is a facilitating factor for effective interaction. Secondly, emotional interactions is likely to trigger learners' positive reactions through what is known as 'Limbic Resonance' (Goleman, 1995). However, in the context of English as a Foreign Language (EFL), numerous studies have shown that supportive emotional conversations between teachers and learners are supposed to reduce anxiety and to elevate fluency and communicative confidence (MacIntyre and Gardner, 1994; MacIntyre,

and Gregersen, 2012). Importantly though, the Communicative Language Teaching Approach emphasizes authentic interaction and social meaning, which are strengthened when emotional attunement occurs among participants in the learning process.

In brief, there has been a consensus among scholars that Limbic Synchrophony contributes to widen classroom interactive dynamics which typically articulate curricular contents. Together the previous research provided important insights into Limbic Synchronphony as a multifaceted theoretical framework that connects neuroscience, educational psychology, and language learning theories. As a consequence, one may suppose that Limbic Synchrophony is a fundamental issue in the pedagogy theory simply because it creates a positive classroom environment that supports oral participation and the development of communicative competence, particularly in contexts where learners experience limited exposure to the foreign language and higher levels of anxiety, as is common in many EFL educational settings.

Empirical Related Works

There have been a number of quantitative studies involving Limbic Synchronphony that have reported promising findings on its implementations in foreign language classrooms. Indeed, such investigations have provided empirical evidence to support the role of Limbic Synchronphony in enhancing EFL speaking skills (Nation, and Newton, 2009). Studies examining teacher immediacy demonstrated that emotionally responsive teaching behaviors significantly increase learners' willingness to communicate and reduce speaking anxiety (Xie and Derakhshan, 2021). Much evidence has also been offered by large-scale quantitative analyses that emotional intelligence predicts oral performance by encouraging empathy, emotional regulation, and communicative engagement (Li, 2020).

Broadly speaking, previous studies involving Limbic Synchrophony teaching strategy have addressed EFL learners' anxiety and timidity .

These studies have confirmed that positive emotional classroom climates contribute to improved fluency and participation (Dewaele and MacIntyre, 2014). Additionally, mediation studies reveal that emotional contagion functions as a mechanism through which teacher enthusiasm enhances student engagement and speaking participation (Frenzel et al., 2021).

Research Questions

Based on the previous introductory discussion, it becomes clear that the key research question of this study was whether or not the Limbic Synchronophony' framework can facilitate Libyan EFL learners' speaking skills. In a more accurate sense, the current study aimed to address the following research questions:

1. To what extent does Limbic Synchrophony influence EFL speaking performance among Grade 4 learners in Libyan elementary schools?
2. Does Limbic Synchrophony teaching strategy increase learners' oral participation and engagement during speaking tasks?
3. Are there statistically significant differences in speaking fluency between learners based on their gender-dichotomy?

Methodology

Research Design

The pre-test and post-test research design represents a widely adopted quantitative research approach for examining the effectiveness of educational interventions through the systematic measurement of subjects' performance before and after the implementation of a specific treatment or instructional program. Within this framework, a pre-test is administered to establish baseline data regarding subjects' initial knowledge, skills, or attitudes, followed by an intervention phase, and subsequently a post-test to evaluate any changes attributable to the treatment. Previous methodological literature in educational research (Dornyei, 2007; Gay et al., 2012; Creswell, 2014) highlight the value

of pre-test–post-test designs in assessing learning progress and exploring potential causal relationships by comparing outcomes across time. Furthermore, Cohen, Manion, and Morrison (2018) argued that this design strengthens internal validity by enabling systematic measurement of change and supporting statistical analyses, such as paired-samples tests, to determine significant differences between pre-intervention and post-intervention scores.

Accordingly, the present study employed a pre-test–post-test design to obtain quantifiable evidence of improvement resulting from the implementation of Limbic Synchrophony as a pedagogical strategy for developing speaking skills. A total of nineteen ($n = 17$) students from Grade 4 (Libyan Public Elementary School) were selected to participate in the study, comprising 9 males and 8 females. The sample was purposefully chosen to represent the classroom population and to allow the investigation of gender-related differences in response to the intervention. This selection facilitated a manageable group size for implementing the Limbic Synchrophony teaching strategy while ensuring sufficient representation of both male and female learners to examine potential variations in learning outcomes and emotional engagement during the instructional activities.

Data Collection Instruments

The study was conducted in the form of classroom oral activities. The researcher designed a set of proposed audiovisual interactions aimed at assessing the subjects' performance in simple English as a Foreign Language (EFL) conversations derived from the Grade 4 prescribed textbook. The pre-test consisted of short, motivationally structured questions intended to stimulate communicative interaction while emphasizing psychological and emotional engagement during conversational tasks.

As a consequence, the intervention activities were purposefully designed to increase oral participation and speaking confidence. In a sense, much emphasis was placed on the establishment of emotional

harmony between the teacher and learners. Due to this social connectedness, certain techniques were utilized, including eye contact, body gesture, tone of voice, and reciprocal emotional responsiveness. Accordingly, the teacher's excitement stimulates learners' willingness which make them feel comfortable and more likely to synchronize with the teacher's emotional state.

Following a three-week intervention period (12 classes) based on the principles of Limbic Synchrophony, a post-test was administered using an equivalent format to the pre-test in order to ensure consistency and enable accurate comparison of performance outcomes. Notably, gender dichotomy was also taken into account to facilitate comparative analysis and determine the extent to which male and female subjects were positively affected by the Limbic Synchrophony teaching strategy.

Data Analysis

The obtained data were analyzed using quantitative statistical procedures to examine changes in the subjects' conversational performance following the implementation of the Limbic Synchrophony-based instructional intervention. Pre-test and post-test scores were first organized and coded using descriptive statistical measures, including means to identify general performance trends. These tools were chosen for their reliability in capturing meanings behind the subjects' progress. This data analysis technique was typically consistent with quantitative research practices in applied linguistics (Dornyei, 2007; Mertens, 2005; Creswell, 2014). Paired-sample comparisons were conducted to determine whether statistically significant differences existed between the subjects in achieving well interactions before and after the three-week intervention period. Additionally, gender-based comparative analysis was carried out to examine possible differences in outcomes between male and female

subjects and to what extent the Limbic Synchrophony teaching strategy yielded differential effects across gender groups.

In sum, the selected data analysis technique focused on measuring improvements in communicative engagement, conversational accuracy, and overall speaking performance within simple EFL dialogue tasks derived from the Grade 4 English language syllabus, with statistical significance levels guiding interpretation of intervention effectiveness.

Descriptive and Inferential Statistics

By and large, this investigation offers some important insights into the impact of Limbic Synchrophony teaching strategy on EFL speaking progress. Still, the obtained statistics (shown in Table 1) indicated that male subjects demonstrated slight improvement from pre-test to post-test. The mean score increased from 9.00 in the pre-test to 13.33 in the post-test, reflecting an average gain of 4.33 points. The standard deviation SD remained relatively stable (1.87 vs. 2.00),indicating that score variability among male subjects did not change substantially following the intervention.

Conversely, female learners showed noticeable improvement between testing phases. The mean score increased from 10.00 in the pre-test to 14.60 in the post-test, indicating an average gain of 4.60 points. The slight increase in standard deviation SD implies marginally greater variability in post-test performance, though overall score distribution remained consistent.

Table 1 Obtained Scores of Learners' Speaking Pre- and Post-tests

Learners (Males)	**L1**	**L2**	**L3**	**L4**	**L5**	**L6**	**L7**	**L8**	**L9**
Pre-test	10	7	8	12	6	9	11	10	8
Post-test	15	12	14	16	10	13	15	14	11
Learners (Females)	**L10**	**L11**	**L12**	**L13**	**L14**	**L15**	**L16**	**L17**	**L18**	**L19**
Pre-test	13	8	9	13	9	12	11	7	10	8
Post-test	18	12	13	17	14	17	16	12	14	13

It is worth noting that across both gender groups, post-test scores exceeded pre-test scores, implying overall performance improvement. Female learners demonstrated slightly higher mean scores in both pre-test and post-test assessments compared to male learners. However, both groups exhibited similar ranges and comparable variability, suggesting consistent learning effects across participants. The samples of t-test revealed a significant increase in scores from pre-test to post-test for male learners, $t = 15.00$, and $p < .001$. Comparatively, female learners achieved $t = 28.17$, and $p < .001$ which signify substantial improvement following the intervention.

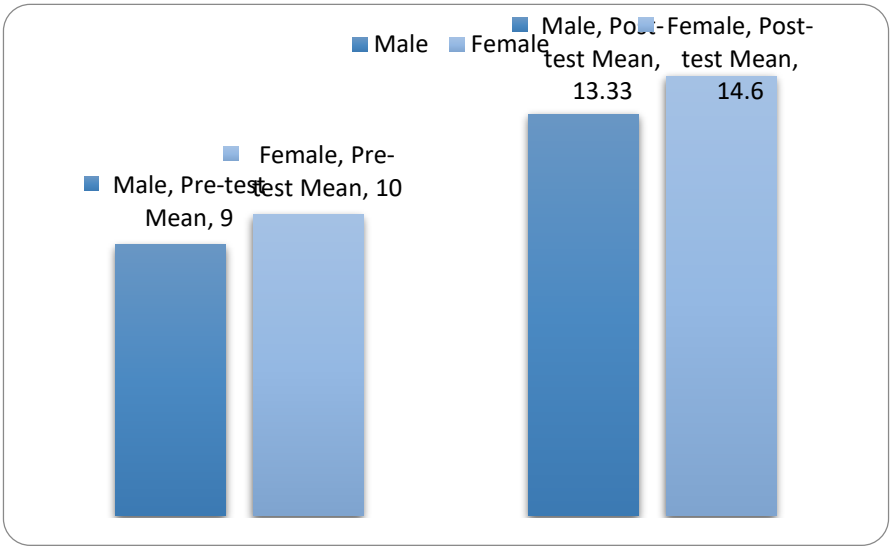


Figure 1 Mean Scores for Pre-test and Post-test by Gender

Discussion

This study set out with the aim of assessing the importance of Limbic Synchrohony within educational contexts. In particular, the question why it is crucial to integrate Limbic Synchrophony teaching strategy during EFL classes in Libyan elementary schools. Consequently, developing English speaking skills was targeted to seek the possible advantages and drawbacks of implementing Limbic Synchrophony teaching strategy.

Contrary to the early expectations, the subjects' scores in the pre- and post-tests revealed that progress has been achieved. In a sense, the subjects' anxiety and timidity were notably reduced based on the emotional contact and collaborative spaces offered during the intervention period. That is, the subjects were keen to communicate because their emotional contacts with the teacher contributed to minimize their fear and apprehension. This pedagogical practice evidently corroborates Krashen's (1982) assumptions (Affective Filter Hypothesis).

Furthermore, the statistics demonstrated that the subjects confidently accomplished a big deal of speaking tasks despite risks of committing errors, passive feedbacks and judgment. Such success, acoording to Dewaele (2015), and Immordino-Yang (2016), might very well be attributed to certain cordial social bonds which were established between the subjects and their teacher. Resultantly, the subjects showed much desire to participate in communicative interactions because English language became rather tied to their feelings than rules. Simply put, the subjects' direct sync with their teacher and peers enabled them to overcome pronunciation and intonation barriers unconsciously.

Importantly, designing synchronous speaking activities (i.e., shifting from teaching speaking to establishing favourable situations where learners exhibit natural speaking turns) ostensibly encouraged the subjects to share goals via Taking- turns and Role-plays. For example, it was obviously observed that the subjects were enthusiastically aspired to participate in solving puzzles and/or convincing each other to do something. Apparently, these simple speaking tasks require integration of verbal and non-verbal language, and therefore, the subjects became more familiar with speaking demands. Indeed, these observations align strongly with previous applied linguistic assumptions (Canale and Swain, 1980; Van Lier, 2004; Kress, 2010; Ellis, 2018) which advocated shifting from teaching speaking to creating authentic situations that generate natural interactions.

The third question in this study sought to determine whether or not gender dichotomy influences Limbic Synchrophony classroom practices. The obtained calculations illustrated that female subjects performed better than their male counterparts. Indeed, this conclusion was expected based on previous linguistic research (Tennan, 1990; Akram, and Ghani, 2013; Femilia and Yusuf, 2023; Seifoori, 2024) provided empirical support that tendencies towards collaborative and relational interactions among female are more than are they among males. regardless of few studies (Oxford and Nyikos, 1989; Ehrman and Oxford, 1995) who argued that gender differences are not decisive limbic synchrophony predictors in terms of mastering speaking skills.

Again, from a socio-cultural perspective, acquiring speaking skills emerges through enthusiastic teacher-learners' interactions. Such a pedagogical cornerstone demonstrates that Limbic Synchrphony teaching strategy aligns with EFL curriculum goals especially those designed for elementary schools. These educational goals involve developing basic oral interaction skills and encouraging learners' participation to establish and reinforce self-confidence in using English. However, in foreign language acquisition, affective issues such as anxiety and emotional processing negatively affect communication performance.

Conclusion

The present study provides empirical support for the pedagogical value of Limbic Synchrophony as an affectively grounded instructional approach in EFL elementary education. The findings indicate that emotionally attuned teacher–learner interactions can meaningfully lower affective barriers, enhance communicative willingness, and facilitate measurable gains in speaking performance. By shifting the focus from rule-centred instruction toward emotionally responsive communicative engagement, learners demonstrated increased confidence, reduced anxiety, and greater participation in authentic speaking tasks. Furthermore, the observed gender-related differences

suggest that affective dimensions may interact with learner characteristics, warranting further investigation. Overall, the integration of Limbic Synchrophony aligns with contemporary communicative and socio-affective language learning frameworks, offering a promising direction for improving speaking outcomes within Libyan EFL contexts and similar educational settings.

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