The Pedagogical Power of Non-Verbal Communication: Investigating Students' Perceptions and Academic Experiences in the Educational Environment

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Abstract

The study investigates the impact of teachers' non-verbal communication behaviours on students' learning experiences, motivation, and emotional well-being in secondary school settings for student perspective. Utilising a mixed-methods approach, the research gathered quantitative data from 300 students across 15 schools and qualitative insights through 30 semi-structured interviews, complemented by systematic classroom observations. The findings reveal that gestures (β=0.289, p<0.001) and body language (β=0.201, p=0.034) significantly enhance students' motivation by improving clarity and fostering emotional support. In contrast, eye contact (β=0.139, p=0.133) and smiling (β=0.000, p=0.999) showed limited predictive value, suggesting their impact depends on contextual and cultural factors. The study highlights how cultural diversity significantly influences the interpretation of non-verbal cues, with variations in cultural norms affecting student engagement and comprehension. Traditional non-verbal communication strategies face particular challenges in virtual learning environments, necessitating alternative approaches such as enhanced vocal modulation and expressive digital cues. These findings underscore the importance of developing culturally adaptive non-verbal communication strategies and incorporating them into teacher education programmes. The research contributes to understanding the complex dynamics of non-verbal communication in educational settings and provides practical implications for improving teaching effectiveness in both traditional and virtual classrooms..

Keywords: *Non-verbal communication, gestures, body language, eye contact, cultural diversity, student motivation*

Introduction

The dynamics of classroom interaction have evolved significantly over the past decades, with increasing recognition of non-verbal communication as a crucial element in the teaching-learning process. Non-verbal communication, which encompasses a complex array of behaviours including facial expressions, gestures, body language, proxemics, and paralinguistic features, has been established as a fundamental component of human interaction, accounting for approximately 55-93% of message interpretation in face-to-face communications (Mehrabian, 1972/2017; Knapp & Hall, 2010).

In educational settings teachers' non-verbal communication is essential for enhancing classroom dynamics and learning outcomes (Bambaeeroo & Shokrpour, 2017; Ghafar & Mahmood, 2023-). Andersen and McCroskey links positive behaviours, such as smiling and varied vocal tones, to increased motivation and inclusivity, while negative cues can create barriers to learning (Andersen, 1999; McCroskey, et al., 2006). Immediacy behaviours, including proximity and sustained eye contact, improve cognitive and emotional outcomes, as shown by Baringer

and McCroskey (2000). Cultural diversity adds complexity, with interpretations of non-verbal behaviours varying across cultures (Kirch, 1979; Denham & Onwuegbuzie, 2013). For instance, TingToomey and Dorjee (2015) noted that while direct eye contact conveys respect in some cultures, it may feel confrontational in others, highlighting the need for culturally responsive practices to ensure inclusivity. Non-verbal cues also aid instruction, simplifying complex concepts through illustrative gestures and expressive tones, as noted by Meadow (2000). Also, they play a vital role in classroom management by maintaining order and fostering a welcoming environment, as emphasized by Zeki (2009-), Bambaeeroo and Shokrpour (2017). Non-verbal communication strongly influences academic performance by creating a supportive learning atmosphere, as demonstrated by Sajjad et al. (2023), and Su (2024). However, ambiguous or negative signals can hinder comprehension (Chung, 2000). In technology-mediated classrooms, non-verbal cues such as video gestures and digital emoticons maintain engagement and motivation, as Fauville et,al. (2023) andSuen -& Hung (2024) argue. These findings underscore the critical role of non-verbal communication in fostering effective, inclusive, and adaptable teaching practices across traditional and digital settings.

Also, the non-verbal elements serve as powerful tools that can either enhance or impede the learning process, affecting students' cognitive, affective, and behavioural outcomes (Hall, et al., 2018; Noor, et al., 2024). Haleem, et al. (2022), United Nations (2020) have highlighted the transformative nature of educational environments, particularly in light of technological advancement and increasing cultural diversity. The International Education Association (2022) reports that 78% of educational institutions worldwide now employ hybrid learning models, creating new challenges and opportunities in teacher-student communication. This shift has fundamentally altered the traditional dynamics of non-verbal interaction, requiring teachers to adapt their communication strategies across different modalities while maintaining effective pedagogical practices. Also, the globalization of education has introduced additional complexity to classroom communication. With international student mobility projected to exceed 8 million by 2025 (OECD,2009 UNESCO, 2022), cultural variations in non-verbal behaviour interpretation have become increasingly significant. Bambaeeroo and Shokrpour (2017), Ghafar and Mahmood (2023) demonstrate how cultural differences in non-verbal communication can significantly impact student-teacher relationships and learning outcomes, emphasizing the need for cultural sensitivity in pedagogical approaches.

The psychological impact of teachers' non-verbal behaviour has gained prominence in educational research, Ghafar and Mahmood (2023-), Hossain (2024) indicate its crucial role in creating supportive learning environments. Zeki (2009), Davidson, et al. (2021) reveal that effective non-verbal communication can improve student engagement by up to 40% and significantly reduce anxiety levels in classroom settings. This finding is particularly relevant given the rising concerns about student mental health and well-being in educational institutions worldwide. Contemporary educational theories, i.e., constructivism (Vygotsky, 1978), experiential learning theory (Kolb, 1984/2014), humanism (Maslow, 1943; Richardson, 2016), transformative learning theory (Mezirow, 1991), progressivism (Dewey, 1938), critical pedagogy (Freire, 1993) and discovery learning (Bruner,_1974) emphasize the importance of student-centered learning approaches, where understanding learners' perceptions and experiences becomes crucial for effective teaching. But current teacher preparation programmes dedicate minimal attention to non-verbal communication skills (Bambaeeroo & Shokrpour, 2017; Darinskaia, 2019), with the Educational Standards Board (2022) reporting that less

than 5% of teacher training curricula address this critical aspect of pedagogy. This gap between research and practice underscores the need for comprehensive investigation into how students perceive and interpret teachers' non-verbal communication. Although extensive literature emphasizes the importance of non-verbal communication for teachers, the student perspective remains underexplored. Most studies focus on how non-verbal behaviours affect teaching efficacy, often neglecting how students interpret and respond to these cues. Understanding students' perceptions of non-verbal communication is crucial because their interpretations directly influence their academic engagement and emotional well-being.

Objectives of the Study

The objective of this study is to examine the impact of teachers' non-verbal communication behaviours such as gestures, body language, eye contact, and smiling on students' motivation, engagement, and emotional well-being. It aims to analyze gender differences in students' perceptions of these behaviors and explore the influence of cultural diversity on their interpretation and effectiveness in classroom settings. Also, the study seeks to evaluate the role of non-verbal communication in reducing classroom anxiety and fostering a supportive learning environment. Finally, it investigates the effectiveness of these strategies in both traditional and digital learning contexts, providing insights into adapting non-verbal communication to diverse and technology-mediated educational environments.

Research Methodology

Research Design

This study utilised a mixed-methods research design to investigate students' perceptions of teachers' non-verbal communication and its influence on learning outcomes.

Population and Sample

The population of this study comprises secondary school students and teachers from Western Odisha, specifically from the districts of Boudh, Bargarh, Bolangir, Jharsuguda, Nuapada, Sambalpur, and Subarnapur. To ensure representation from both urban and rural settings, the sample is drawn from 15 randomly selected schools. These schools include two from Sambalpur (one urban and one rural), three from Bargarh (two urban and one rural), three from Boudh (one urban and two rural), two from Bolangir (one urban and one rural), two from Jharsuguda (one urban and one rural), one rural school from Nuapada, and two rural schools from Subarnapur district. This selection ensures geographical and contextual diversity in the study.

For the quantitative survey, a total of 300 students -were randomly selected from the chosen schools. The distribution across districts includes 60 students from Bargarh (38 female, 22 male), 40 from Sambalpur (31 female, 9 male), 60 from Boudh (32 female, 28 male), 40 from Bolangir (22 female, 18 male), 40 from Jharsuguda (25 female, 15 male), 20 from Nuapada (4 female, 16 male), and 40 from Subarnapur (26 female, 14 male). This structured selection ensures a balanced gender representation and a fair distribution across the districts.

For qualitative insights, 30 students -were purposively selected for semi-structured interviews. The selected students -included five from Bargarh, five from Sambalpur, four from Boudh, four from Subarnapur, four from Bolangir, four from Jharsuguda, and four from Nuapada. This qualitative component aims to provide a deeper understanding of students' perspectives, experiences, and interactions, complementing the findings from the quantitative survey. Also, teachers who directly interact with students in the classroom were observed for their non-verbal communication. Their gestures, facial expressions, posture, and overall body language were examined to assess

their role in facilitating effective classroom communication. This observational data -contributed valuable insights into the pedagogical implications of non-verbal communication in teaching and learning processes.

To ensure representativeness, diversity, and practical feasibility, the study employs a combination of random sampling, purposive sampling, and non-probability sampling methods. The random selection of students for the survey enhances the generalizability of the findings, while purposive sampling for qualitative interviews allows for the exploration of specific perspectives. The inclusion of non-probability sampling for teacher observations ensures flexibility in capturing real-time classroom interactions. This mixed-methods approach strengthens the study's credibility by integrating both statistical representation and in-depth qualitative insights.

Instruments and Procedures

The study employed surveys, interviews, and observations as data collection tools. An expert validated 5-point Likert-scale with reliability score of Cronbach's $\alpha = 0.82$ was used for survey. Semi-structured interviews provided deeper insights into participants' perceptions, while observational checklists systematically documented teachers' non-verbal behaviours in classrooms over two weeks. Data collection was conducted in three phases: administering surveys, conducting 20to25-minute interviews, and observing classrooms, ensuring a triangulated and comprehensive approach.

Data Analysis

The study employs both quantitative and qualitative analysis for comprehensive insights. Quantitative data is summarized using descriptive statistics and analyzed with inferential techniques like chi-square tests, t-tests, and regression models in R-Studio, utilizing Python (Google Colab) for visualization. Thematic analysis of qualitative data identifies patterns, with triangulation of observational, survey, and interview data enhancing validity. Ethical protocols, including informed consent, confidentiality, and institutional approval, are strictly followed. Triangulation ensures the study's credibility, offering a robust understanding of non-verbal communication's impact in educational contexts.

Analysis and Interpretation

Analysis and interpretation can be categorised into two parts: quantitative, qualitative.

Quantitative Analysis and its Interpretation

The study reveals a balanced gender representation, with a slightly higher number of female respondents. Across genders, most students noted the importance of teachers' non-verbal cues—such as gestures, facial expressions, and tone of voice-in effective interactions. Positive non-verbal behaviours, including eye contact, gestures, and body language, reinforced verbal messages, enhanced clarity, and fostered emotional connections. While smiling received mixed ratings, it helped reduce power distances and created warmth, with its effectiveness influenced by cultural and individual factors. Cultural norms and online learning contexts shaped perceptions of non-verbal communication, particularly in eye contact and proximity. In online settings, facial expressions became more prominent, though the lack of physical presence limited the impact of gestures and proximity. Non-verbal behaviours also alleviated anxiety for many students, although some highlighted the need for verbal reassurance. Non-verbal communication influenced group dynamics, with inclusive gestures fostering collaboration during activities. Most respondents rated the impact of teachers' non-verbal behaviours on classroom atmosphere as high, emphasizing their role in creating a supportive learning environment (Table 1). These findings highlight the critical role

of intentional non-verbal communication in enhancing both group and individual learning experiences.

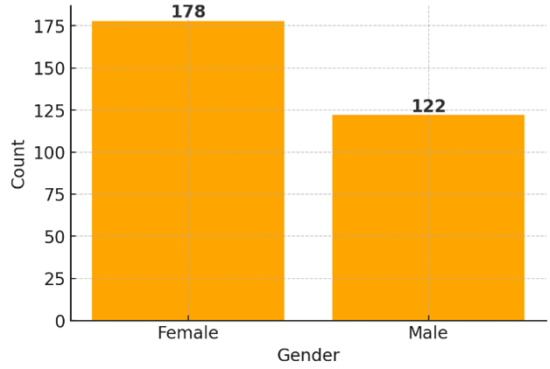

Figure 1.Gender Distribution

Table 1: Impact of Teachers' Non-Verbal Behaviours on Classroom Atmosphere

Rating	Percentage of Responses
Very High Impact	50
High Impact	35
Moderate Impact	10
Low Impact	5

Students - Noticing Teachers' Non-verbal Cues

The Chi-Square Test and independent samples t-test were used to examine students' perceptions of non-verbal communication of teacher. The Chi-Square Test revealed a gender-based association in noticing teachers' non-verbal cues. Specifically, 112 females reported always noticing cues compared to 32 males, while more males (30) than females (5) reported often noticing them. The sample included 178 females and 122 males, totaling 300 students (Table 2).

Table 2: Observed Frequencies of Gender vs. Frequency of Noticing Non-Verbal Cues

Frequency of Noticing Non-Verbal Cues	Female	Male	Total
Always	112	32	144
Never	20	4	24
Often	5	30	35
Rarely	5	2	7
Sometimes	44	46	90
Total	178	122	300

A chi-square test of independence was conducted to determine whether the observed differences were statistically significant. The formula for calculating the chi-square statistic is:

$$\chi^2 = \sum \frac{(O-E)^2}{E}$$

The Chi² analysis (X^2 = 34.11, df = 4, p = 7.07×10^{-7}) revealed a significant relationship between gender and the frequency of noticing non-verbal cues ($p < 0.05$). These results suggest that gender influences students' perception of teachers' non-verbal communication, with females generally more attuned to such cues. Table 2 visually highlights these gendered differences, emphasizing the need to consider gender when developing non-verbal communication teaching strategies.

Gender and Gesture Effectiveness

Independent samples t-test was conducted to investigate whether male and female students differed in their perceptions of the effectiveness of gestures in enhancing learning experiences. The t-test formula used for this analysis is:

$$t = \frac{X_1 - X_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

The analysis compared the mean effectiveness ratings of gestures between male (X_1) and female (X_2) students, considering the variances (s_1^2, s_2^2) and sample sizes (n_1, n_2). The results showed a significant difference, with a t-statistic of -3.17 and a p-value of

0.0018 ($p<0.05$). Female students rated gestures as more effective in enhancing learning compared to male students. This is further illustrated in Figure 2's box plot, which shows a higher median effectiveness rating for gestures among females. These findings suggest the importance of adapting non-verbal strategies to meet the diverse needs of students.

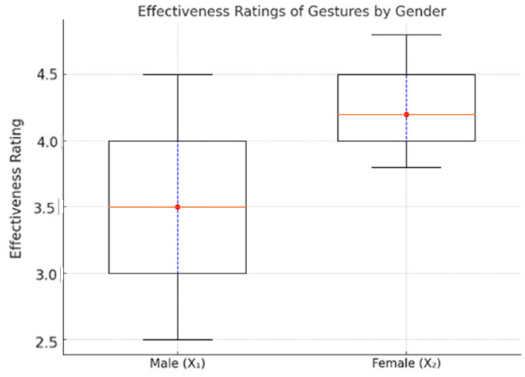

Figure 2.Gestures' effectiveness between male and female students

Non-Verbal Communication and Anxiety Reduction

Logistic regression was used to assess how non-verbal communication behaviours influence anxiety reduction, defined as either reducing anxiety (1) or having no impact (0) from students' perspectives. The regression model is expressed as:

$$\text{Log}\left(\frac{P}{1-P}\right)^{nt} = \beta_o + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4$$

The regression model predicts anxiety reduction (P) based on four predictors: eye contact (X_1), smiling (X_2), gestures (X_3), and body language (X_4). The model's coefficients (Table 3) show that smiling ($\beta = 0.410$) is the strongest positive predictor of anxiety reduction, while gestures ($\beta = 0.059$) have a minimal effect. Body language ($\beta = -0.015$) has a negligible negative effect, indicating its reassurance value may vary, and eye contact ($\beta = -0.277$) negatively correlates with anxiety reduction, likely due to cultural differences in its interpretation.

Table 3: Result of Logistic Regression

Predictor	Coefficient (β)	Interpretation
Constant	1.375	Baseline log-odds of anxiety reduction.
Eye Contact	-0.277	Negative relationship with anxiety reduction.
Smiling	0.41	Positive and strongest predictor, indicating its strong role in reducing anxiety.
Gestures	0.059	Minimal positive effect on anxiety reduction.
Body Language	-0.015	Negligible and slightly negative relationship with anxiety reduction.

The logistic regression model effectively predicted cases where non-verbal communication reduced anxiety but struggled with non-reduction cases, as shown in Figure 3.

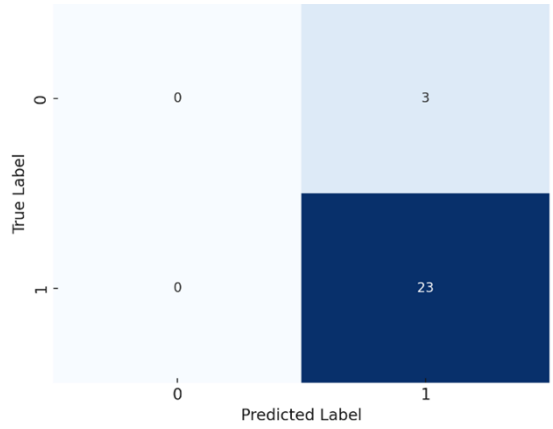

Figure 3: Confusion Matrix of Logistic Regressions Predictions

This class imbalance highlights the need for larger, more balanced datasets to improve the model's accuracy. The findings stress the importance of teachers using culturally sensitive, intentional non-verbal communication, such as smiling, to foster a supportive and emotionally safe learning environment.

Non-Verbal Communication and Motivation to Learn

A multiple linear regression model was used to analyze the relationship between teachers' non-verbal communication and students' motivation to learn (Y) from student perspective. The independent variables were the perceived effectiveness of four non-verbal behaviours: eye contact (X1), smiling (X2), gestures (X3), and body language (X4), each rated on a Likert scale from 1 (Very Ineffective) to 5 (Very Effective). The model is structured as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$$

In the regression model, β_0 is the constant, β_1, β_2, β_3, β_4 are the predictor coefficients, and ϵ is the error term. The results are presented in Table 4.

Table 4: Result of regression model

Predictor	Coefficient (β)	Standard Error	t-Statistic	p-Value	Significance
Constant	1.497	0.301	4.97	< 0.001	***
Eye Contact	0.139	0.092	1.51	0.133	NS
Smiling	0	0.091	0.002	0.999	NS
Gestures	0.289	0.081	3.595	< 0.001	***
Body Language	0.201	0.094	2.135	0.034	**

The results highlight that gestures (β=0.289) and body language (β=0.201) are key motivators, enhancing clarity and emotional support. In contrast, eye contact (p=0.133) and smiling (p=0.999) had minimal impact, suggesting students value clarity over emotional warmth. These findings emphasize the importance of intentional use of gestures and body language in effective teaching.

Thematic Analysis of Interview and Classroom Observation

Role of Non-Verbal Communication in Teaching

Interview data and classroom observations highlighted the crucial role of non-verbal communication in effective teaching.

Students noted that gestures, facial expressions, eye contact, and body language enhanced their understanding. Observations confirmed that teachers' illustrative gestures and open body language fostered an engaging learning environment. Positive non-verbal cues like smiles and nods reinforced verbal explanations, providing clarity and encouragement. Conversely, monotonous or lackluster non-verbal behaviour led to reduced attention and interest.

Impact on Student Learning and Motivation

Students highlighted the impact of non-verbal communication on their learning and motivation, with gestures and body language seen as effective for simplifying complex concepts. Many students noted that dynamic and expressive teachers made lessons more engaging. Classroom observations confirmed that motivated student engagement was linked to teachers' consistent use of non-verbal cues. In contrast, students felt disconnected and less motivated when teachers relied solely on verbal instructions without non-verbal reinforcement.

Cultural Diversity and Non-Verbal Communication

The data revealed that cultural diversity significantly influenced students' interpretations of teachers' non-verbal cues. Interviews showed varied comfort levels with behaviours like eye contact and physical proximity; some students saw prolonged eye contact as attentive, while others found it intrusive. Similarly, cultural differences shaped perceptions of gestures and facial expressions, with some students viewing animated gestures as enthusiasm, while others found them assertive. Classroom observations emphasized the need for teachers to adopt culturally responsive practices, adjusting proximity and tone to meet diverse student expectations (Figure 4).

Figure 4: Distribution of nonverbal communication themes

Non-Verbal Communication in Digital Learning Environments

Students noted challenges in interpreting non-verbal communication in hybrid and online learning contexts, with traditional cues like proximity and full-body gestures being less effective or absent. They relied more on facial expressions and vocal modulation to gauge emotions and understand instructions. Observations showed that teachers who used expressive facial cues and varied tones-maintained engagement, despite the lack of physical presence. However, students highlighted the difficulty of achieving the same level of connection and engagement in virtual settings as in traditional classrooms.

Emotional and Psychological Dimensions

Interviews and classroom observations highlighted the emotional impact of non-verbal communication on students. Positive cues, such as warm smiles, encouraging gestures, and eye contact, reduced anxiety and fostered comfort, creating an emotionally safe space that encouraged participation. In contrast, indifferent or dismissive behaviours demotivated students, making them feel undervalued and hesitant to engage.

Classroom Management and Group Dynamics

Non-verbal communication played a key role in classroom management and fostering collaboration, as highlighted in both interviews and observations. Students observed that teachers' use of eye contact, tone modulation, and gestures helped maintain discipline and set clear expectations. Observations confirmed that open gestures and inclusive body language encouraged teamwork during group activities. Teachers who consistently used non-verbal cues to guide interactions created a more harmonious and engaging classroom environment, promoting both individual and group participation.

Challenges and Opportunities

The data revealed challenges in teachers' use of non-verbal communication, with students noting instances of ambiguity or inconsistency, leading to confusion or disengagement. Observations showed that some teachers struggled to adapt their non-verbal cues, especially in multicultural or digital settings. However, both students and observations highlighted opportunities for improvement. Teachers who deliberately used non-verbal strategies created more inclusive and engaging environments, indicating a need for targeted training programmes to enhance the effective use of non-verbal communication across diverse educational contexts.

Triangulation and Discussion

The descriptive, inferential, and thematic analyses of the study were triangulated and discussed as below.

Descriptive analysis showed that most students consistently observed their teachers' non-verbal behaviours, such as gestures, facial expressions, and tone of voice, often rating them as always noticeable. This highlights the importance of non-verbal communication in effective teaching, aligning with Mehrabian's (1971) model, which attributes up to 93% of emotional communication to non-verbal channels. Dynamic non-verbal behaviors were found to enhance student attention and engagement, supporting Hall (2001), and Petković, et al. (2024) claim that positive non-verbal cues foster inclusivity and emotional connection. However, Wahyuni (2018), Farid, et al. (2023) emphasize that non-verbal communication alone is insufficient for effective teaching, requiring integration with verbal strategies. This study corroborates their view, as students reported lower engagement when non-verbal cues were misaligned with verbal messages, underscoring the need for congruence between verbal and non-verbal communication for clarity and coherence in instruction. Regression analysis revealed that gestures and body language significantly predicted students' motivation, whereas eye contact and smiling did not.

These results align with Cienki (2022), and Alibali and Hostetter (2024) findings on gestures as essential for simplifying abstract concepts and bridging cognitive gaps. Observational data confirmed that dynamic gestures and expressive body language enhanced engagement and comprehension, particularly in complex subjects, consistent with Kang and Tversky (2016), Nirwanto Maruf, et al. (2024). The limited significance of eye contact and smiling contrasts with Centorrino, et al.'s (2015) emphasis on trust-building behaviours. Ting-Toomey's (1999) work suggests cultural factors, with collectivist students prioritizing instructional clarity over emotional rapport. Thematic analysis further indicated that students valued non-verbal behaviours that directly improved instructional effectiveness over those focused on emotional warmth. Finally, McCroskey, et al. (2006) highlight the necessity of integrating verbal strategies with non-verbal communication for effective teaching. This study supports that view, as students reported lower engagement when non-verbal cues were misaligned with verbal messages. These findings underscore the importance of congruence between verbal and non-verbal communication for instructional clarity and coherence. Regression analysis revealed that gestures ($\beta = 0.289$, $p < 0.001$) and body language ($\beta = 0.201$, $p = 0.034$) significantly predicted students' motivation, whereas eye contact ($\beta = 0.139$, $p = 0.133$) and smiling ($\beta = 0.000$, $p = 0.999$) did not. These results align with Goldin-Meadow's (2003) findings on gestures as essential for simplifying abstract concepts and bridging cognitive gaps. Observational data confirmed that dynamic gestures and expressive body language enhanced engagement and comprehension, particularly in complex subjects, consistent with Kang and Tversky (2016) and Nirwanto Maruf, et al. (2024). The limited significance of eye contact and smiling contrasts with Hamre and Pianta's (2006) emphasis on trust-building behaviors. Ting-Toomey's (1999) work suggests cultural factors, with collectivist students prioritizing instructional clarity over emotional rapport. Thematic analysis further indicated that students valued non-verbal behaviors that directly improved instructional effectiveness over those focused on emotional warmth. Finally, McCroskey, et al. (2006) highlight the necessity of integrating verbal strategies with non-verbal communication for effective teaching. This study supports that view, as students reported lower engagement when non-verbal cues were misaligned with verbal messages. These findings underscore the importance of congruence between verbal and non-verbal communication for instructional clarity and coherence. The shift to hybrid and online learning has complicated non-verbal communication. Traditional cues like proximity and full-body gestures lose effectiveness in virtual settings, elevating the importance of facial expressions and vocal modulation, as supported by Hall, et al.'s (2019) work on computer-mediated communication. However, McQuiggan, et al. (2015) highlight that the lack of physical presence reduces the emotional impact of non-verbal cues. Interviews revealed students feeling less connected to instructors online, despite effective use of expressions and tone. Observations confirmed that teachers who adapted non-verbal strategies for digital contexts better sustained student attention, echoing Hrastinski's (2008) call for innovation in non-verbal communication for online education. Logistic regression identified smiling ($\beta = 0.410$) as the strongest predictor of reduced anxiety, highlighting its importance in fostering a supportive classroom environment. Students linked warm non-verbal behaviours, like smiles and encouraging gestures, with lower anxiety and greater comfort, consistent with Moudatsou, et al.'s (2020) findings on empathetic cues enhancing trust and reassurance. In contrast, indifferent or dismissive non-verbal cues, as noted by Galloway, et al. (2017), increased anxiety and disengagement. Observations confirmed that positive non-verbal behaviours, such as open gestures and sustained eye

contact, created emotionally safe spaces that encouraged participation. Descriptive and thematic analyses underscored the role of non-verbal communication in classroom management and collaboration. Teachers effectively used eye contact, tone modulation, and gestures to maintain discipline and foster teamwork, aligning with Bambaeeroo and Shokrpour's (2017) findings on the importance of non-verbal cues in preempting disruptions and guiding interactions. Marzano, et al. (2001), however, emphasize combining non-verbal strategies with clear verbal instructions for equitable management. This study corroborates their view, as teachers employing both methods achieved greater consistency in maintaining order and collaboration. The study identified challenges in the effective use of non -verbal communication, especially in multicultural and digital settings. Students often reported ambiguity and misalignment between non-verbal and verbal messages, hindering engagement, aligning with Ladson-Billings' (1995) emphasis on culturally relevant pedagogy. However, teachers using adaptive and culturally responsive strategies fostered more inclusive classrooms. Observational data underscored the value of targeted professional development in enhancing educators' non-verbal communication skills.

Findings

1. Gestures and body language significantly predicted students' motivation, enhancing clarity, engagement, and emotional support.
2. Eye contact and smiling were not significant predictors, suggesting their impact may depend on context or other non-verbal cues.
3. Cultural diversity influenced the interpretation of non-verbal behaviours, highlighting the need for culturally adaptive strategies in multicultural classrooms.
4. Traditional non-verbal cues faced limitations in virtual settings, emphasizing the need for alternative strategies like vocal modulation and expressive facial cues.

Conclusion

This study underscores the critical role of teachers' non-verbal communication, particularly gestures and body language, in fostering student engagement and motivation. While these cues proved highly impactful, the non-significance of eye contact and smiling highlights the nuanced nature of non-verbal behaviours, influenced by cultural, contextual, and individual factors. The findings also emphasize the challenges of hybrid and digital learning environments, where traditional non-verbal strategies must be adapted to sustain engagement. Educators can enhance teaching effectiveness by employing intentional gestures and body language, adopting culturally responsive practices, and leveraging expressive facial cues and vocal variation in virtual settings. Future research should explore the long-term impacts of non-verbal communication on academic outcomes and emotional well-being, as well as investigate how technology-mediated cues can address the unique challenges of digital classrooms.

References

Alibali, M. W. & Hostetter, A. B. (2024). *Gestures in cognition: Actions that bridge the mind and the world* (A. Cienki, Ed.; pp. 501–524). Cambridge University Press.

Andersen, P. A. (1999). *Nonverbal communication: Forms and Functions*. Waveland Press, Inc.

Bai, Q., Dan, Q., Mu, Z. & Yang, M. (2019). A Systematic Review of Emoji: Current Research and Future Perspectives. *Frontiers in Psychology, 10*(2221). https://doi.org/10.3389/fpsyg.2019.02221

Bambaeeroo, F., & Shokrpour, N. (2017). The impact of the teachers' nonverbal communication on success in teaching. *Journal of Advances in Medical Education & Professionalism, 5*(2), pp.51–59.

Baringer, D. K. & McCroskey, J. C. (2000). Immediacy in the classroom: Student immediacy. *Communication Education, 49*(2), 178–186. https://doi.org/10.1080/03634520009379204

Bruner, J. (1974). *Toward a Theory of Instruction*. Harvard University Press.

Centorrino, S., Djemai, E., Hopfensitz, A., Milinski, M. & Seabright, P. (2015). Honest signaling in trust interactions: smiles rated as genuine induce trust and signal higher earning opportunities. *Evolution and Human Behavior, 36*(1), 8–16. https://doi.org/10.1016/j.evolhumbehav.2014.08.001

Chung, J. S. L. (2000). Signals and reading comprehension — theory and practice. *System, 28*(2), 247–259. https://doi.org/10.1016/s0346-251x(00)00010-5

Cienki A. (2022). The study of gesture in cognitive linguistics: How it could inform and inspire other research in cognitive science. *Wiley interdisciplinary reviews. Cognitive science, 13*(6), e1623. https://doi.org/10.1002/wcs.1623

Darinskaia, L. (2019). Nonverbal Communication Competence as a Component of Future University Teachers` Professional Culture. In N. I. Almazova , A. V. Rubtsova, & D. S. Bylieva (Eds.), *Professional Culture of the Specialist of the Future*. https://doi.org/10.15405/epsbs.2019.12.36

Denham, M. A., & Onwuegbuzie, A. J. (2013). Beyond Words: Using Nonverbal Communication Data in Research to Enhance Thick Description and Interpretation. *International Journal of Qualitative Methods, 12*(1), 670–696. https://doi.org/10.1177/160940691301200137

Dewey, J. (1938). *Experience and Education*. Macmillan.

Farid, N., Khan, G. A., Ullah, E., Parveen, R., Khalid, T., Ullah, A. & Noor, I. (2023). Effectiveness of Verbal and Non-Verbal Communication for Teaching and Learning at University Level. *Journal of Education and Social Studies, 4*(3), 635–644. https://doi.org/10.52223/jess.2023.4323

Fauville, G., Luo, M., Queiroz, A. C. M., Lee, A., Bailenson, J. N., & Hancock, J. (2023). Video-conferencing usage dynamics and nonverbal mechanisms exacerbate Zoom Fatigue, particularly for women. *Computers in Human Behavior Reports*, 10, 100271. https://doi.org/10.1016/j.chbr.2023.100271

Freire, P. (1993). *Pedagogy of the Oppressed*. Continuum.

Galloway, K. (2017). Foreword [Review of Foreword]. *Legal Education Review*. https://doi.org/10.53300/001c.6106

Ghafar, Z. & Mahmood, H. (2023-). Nonverbal Communication in the Classroom and its Role in the Teaching and Learning from Educational Process. *Journal of Social Science (JoSS), Vol. 2*, No. 6, pp., 712–719. https://doi.org/10.57185/joss.v2i6.82

Goldin-Meadow, S. (2004). Gesture's Role in the Learning Process. *Theory Into Practice, 43*(4), 314–321. https://doi.org/10.1207/s15430421tip4304_10

GUDYKUNST, W. B., & TING-TOOMEY, S. (1999). Culture and Affective Communication. *American Behavioral Scientist, 31*(3), 384–400. https://doi.org/10.1177/000276488031003009

Haleem, A., Javaid, M., Qadri, M. A., & Suman, R. (2022). Understanding the role of digital technologies in education: A review. *Sustainable Operations and Computers, 3,* 275–285. https://doi.org/10.1016/j.susoc.2022.05.004

Hall, J. A. (2001). Nonverbal Communication, Social Psychology of. In *International Encyclopedia of the Social & Behavioral Sciences* (pp. 10702–10706). https://doi.org/10.1016/b0-08-043076-7/01813-1

Hall, J. A., Horgan, T. G., & Murphy, N. A. (2018). Nonverbal Communication. *Annual Review of Psychology, 70*(1), 271–294. https://doi.org/10.1146/annurev-psych-010418-103145

Hall, J., Horgan, T., & Murphy, N. (2019). Nonverbal Communication. *Annual Review of Psychology, 70*. https://doi.org/10.1146/annurevpsych010418103145

Hamre, B. K., & Pianta, R. C. (2006). Can instructional and emotional support in the first-grade classroom make a difference for children at risk of school failure? Child Development, 76(5), 949–967. https://doi.org/10.1111/j.1467-8624.2005.00889.x

Hossain, K. I. (2024). Reviewing the role of culture in English language learning: Challenges and opportunities for educators. *Social Sciences & Humanities Open*, 9, 100781. https://doi.org/10.1016/j.ssaho.2023.100781

Hrastinski, S. (2008). What is online learner participation? A literature review. *Computers & Education, 51*(4), 1755–1765. https://doi.org/10.1016/j.compedu.2008.05.005

International Education Association - (n.d.). *Publications* | - https://www.iea.nl/publications

Kang, S., & Tversky, B. (2016). From hands to minds: Gestures promote understanding. *Cognitive Research: Principles and Implications, 1*(4). https://doi.org/10.1186/s41235-016-0004-9

Kirch, M. S. (1979). Non-Verbal Communication across Cultures. *The Modern Language Journal, 63*(8), 416. https://doi.org/10.2307/326027

Knapp, M., & Hall, J. (2010). *NonVerbal Communication in Human Interaction*. Wadsworth Publishing Co Inc.

Kolb, D. (2014). *Experiential learning: Experience as the source of learning and development* (2nd ed.). Pearson Education, Inc. (Original work published 1984)

Ladson-Billings, G. (1995). Toward a theory of culturally relevant pedagogy. American Educational Research Journal, *32*(3), 465–491. https://doi.org/10.3102/00028312032003465

Marzano, M. (2001). Nouvelles formes d'exploitation. *Cités, 35*(3), 111. https://doi.org/10.3917/cite.035.0111

Maslow, A. (1943). Theory of human motivation. In *Psychological Review* (Vol. 50, pp. 370–396). Wilder Publications.

McCroskey, J. C., Richmond, V. P. & McCroskey, L. L. (2006). *Nonverbal Communication in Instructional Contexts* (pp. 421–436). https://doi.org/10.4135/9781412976152.n22

McCroskey, L., McCroskey, J. & Richmond, V. (2006). Analysis and Improvement of the Measurement of Interpersonal Attraction and Homophily. *Communication Quarterly, 54*(1), 1–31. https://doi.org/10.1080/01463370500270322

McQuiggan, S., Kosturko, L., McQuiggan, J. & Sabourin, J. (2015). *Section 1: The Mobile Classroom*. 23–24. https://doi.org/10.1002/9781118938942.part1

Meadow, S. G. (2000). Beyond Words: The Importance of Gesture to Researchers and Learners. *Child Development, 71*, 231–239. https://doi.org/10.1111/14678624.00138

Mehrabian, A. (1972). *Nonverbal Communication. By Albert Mehrabian*. Chicago, Ill. Aldine-Atherton.

Mehrabian, A. (2017). *Nonverbal Communication*. Routledge. https://doi.org/10.4324/9781351308724 (Original work published 1972)

Mehrabian, A., & Diamond, S. G. (1971). Seating Arrangement and Conversation. *Sociometry, 34*(2), 281. https://doi.org/10.2307/2786417

Mezirow, J. (1991). *Transformative dimensions of adult learning*. Jossey-Bass.

Moudatsou, M., Stavropoulou, A., Philalithis, A., & Koukouli, S. (2020). The role of empathy in health and social care professionals. *Healthcare, 8*(1), 1–9. https://doi.org/10.3390/healthcare8010026

Ndongko, T. M., & Agu, A. A. (1985). The impact of communication on the learning process: A study of secondary schools in Calabar municipality, cross river state of Nigeria. *International Review of Education, 31*(1), 205–221. https://doi.org/10.1007/bf02262577

Nirwanto Maruf, Husain, D., Sri Mujayanah, Tiana, E. A. & Santoso, K. H. (2024). Gestures in Language Instruction: Bridging the Gap for Effective Correction and Learning. *Al-Lisan, 9*(2), 167–184. https://doi.org/10.30603/al.v9i2.5174

Noor, Mageswaran, N., Bujang, S. M. & Mohd. (2024). Beyond words: analyzing non-verbal communication techniques in a medical communication skills course via synchronous online platform. *Frontiers in Medicine, 11*. https://doi.org/10.3389/fmed.2024.1375982

OECD. (2009). Higher education to 2030: Volume 2 – Globalisation. OECD Publishing. https://doi.org/10.1787/9789264075375-en

Petković, U., Frenkel, J., Hellwich, O. & Lazarides, R. (2024). Nonverbal Immediacy Analysis in Education: A Multimodal Computational Model. In O. Brock & J. Krichmar (Eds.), *From Animals to Animats* 17 (pp. 326–338). Springer Nature Switzerland.

Richardson, W. (2016). *Freedom to learn*. Solution Tree Press, A Division of Solution Tree.

Sajjad, T., Khan, H. F., Yasmeen, R. & Waqas, A. (2023). Language of actions: The effects of teacher's kinesics on student learning and learning environment. *Journal of Education and Health Promotion, 12*(1), 53. https://doi.org/10.4103/jehp.jehp_992_22

Su, C. (2024). Learning Environment as an Influencer of Students' Performance in a University in China. *Journal of Education and Educational Research, 9*(2), 283–287. https://doi.org/10.54097/53wwyp21

Suen, H.-Y., & Hung, K.-E. (2024). Enhancing learner affective engagement: The impact of instructor emotional expressions and vocal charisma in asynchronous video-based online learning. *Education and Information Technologies*. https://doi.org/10.1007/s10639-024-12956-w

Suryani, A. (2016). Redefining The Potential Role of Charismatic Language Teachers in Creating Supportive Academic Atmosphere Through Students' Motivational Arousal. *Jurnal Sosial Humaniora*, 9(1), 59. https://doi.org/10.12962/j24433527.v9i1.1279

Ting-Toomey, S. (1999). Culture and Interpersonal Relationship Development: Some Conceptual Issues. *Annals of the International Communication Association*, 12(1), 371–382. https://doi.org/10.1080/23808985.1989.11678727

Ting-Toomey, S. & Dorjee, T. (2015). Intercultural and intergroup communication competence: Toward an integrative perspective. In A. F. Hannawa & B. H. Spitzberg (Eds.), Communication competence (pp. 503–538). De Gruyter Mouton. https://doi.org/10.1515/9783110317459-021

UNESCO. (2022). *Higher education: How do we unleash the talent of the next generation?* Unesco. org. https://www.unesco.org/en/articles/higher-education-how-do-we-unleash-talent-next-generation

United Nations. (2020). *The Impact of Digital Technologies*. United Digital Library Nations. https://www.un.org/en/un75/impact-digital-technologies

Vygotsky, L. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.

Wahyuni, A. (2018). The Power of Verbal and Nonverbal Communication in Learning. In *www.atlantis-press.com* (pp. 80–83). Atlantis Press. https://doi.org/10.2991/icigr-17.2018.19

Wang, C., Chen, X., Yu, T., Liu, Y. & Jing, Y. (2024). Education reform and change driven by digital technology: a bibliometric study from a global perspective. *Humanities and Social Sciences Communications, 11*(1), 256. https://doi.org/10.1057/s4159902402717y

Zeki, C. (2009-). The importance of nonverbal communication in classroom management. *Procedia Social and Behavioral Sciences, 1*, 1443–1449. https://doi.org/10.1016/j.sbspro.2009.01.254