

Leveraging ELAN Software for Analyzing Storytelling Gestures in Students at SMAN 1 Semaka

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Abstract

This study investigates the use of nonverbal communication (NVC), namely gestures, in the narrative exercises of students at SMAN 1 Semaka. The objective is to determine and classify the precise types and frequencies of gestures used. The use of ELAN software allows for a thorough study, which shows that specific gestures, such as Open Hands (OP) and Head Tilting (HT), are commonly employed and have a substantial impact on improving the delivery of a narrative. On the other hand, gestures such as Hands on Hips (HH) and Hand on Cheek (HCH) were not frequently seen, indicating that their significance may vary depending on the situation and the individual's way of expressing a tale. This study highlights the significance of incorporating Nonviolent Communication (NVC) into educational methods in order to enhance students' proficiency in communication and storytelling. This study enhances our overall comprehension of nonverbal communication in educational environments and emphasises the usefulness of technological tools such as ELAN in furthering educational research.

Keywords: Nonverbal Communication; Storytelling, Gestures; Educational Research; ELAN Software

INTRODUCTION

Storytelling is an innate and widespread human activity that surpasses temporal and cultural boundaries, acting as a fundamental method of communication and self-expression

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(Agan, 2006; Chan, 2021; J. Zhang & Liu, 2022) Storytelling holds great importance in educational settings due to its impact on language acquisition and cognitive growth (Agan, 2006; Hartono & Ananda, 2020). The objective of this study is to investigate the use of gestures in storytelling among students at SMAN 1 Semaka, specifically examining how these nonverbal clues can improve the delivery and understanding of narratives. This research aims to use ELAN software and other technological tools to conduct a thorough analysis of gesture patterns. The goal is to contribute new and valuable insights to the field of educational linguistics.

The significance of storytelling in language instruction cannot be exaggerated. It is a crucial speaking assignment that requires the demonstration of pragmatic speaking abilities through precise language usage, extensive vocabulary, and a well-organised narrative structure (Dizdarevikj & Dizdarevikj, 2019; Hartono & Ananda, 2020). Effective storytelling depends not only on spoken words but also on nonverbal signals, especially gestures, that enhance spoken messages with emotional and contextual complexity (Abner et al., 2015; Akasheva et al., 2018; Sibierska, 2017). Gestures have the ability to animate narratives, depict personalities, highlight occurrences, and communicate subtle emotions, therefore enriching the act of listening and fostering a deeper connection between the storyteller and the audience (Clough & Hilverman, 2018; Cook et al., 2010). The need of thoroughly analysing and comprehending nonverbal components in narrative is emphasised by this multimodal approach to communication.

The current body of literature emphasises the crucial significance of gestures in educational environments. The study conducted by Jelena Bobkina and colleagues in 2023 offers significant findings on the impact of hand and head motions on learning, specifically in enhancing comprehension and memory retention. Research has demonstrated that hand gestures, including iconic gestures that depict particular things or acts, deictic gestures that signal something, and metaphoric gestures that represent abstract ideas, can enhance memory and the structure of narratives (Clough & Hilverman, 2018; Cook et al., 2010). In a similar vein, head movements can convey agreement, disagreement, or emphasis, so enhancing the effectiveness of communication (Andric & Smal, 2012; Novack & Goldin-Meadow, 2015). These studies emphasise the capacity of gestures to enhance classroom interaction and facilitate students' comprehension of the topic. Nevertheless, despite these discoveries, there is still a lack of comprehension of the precise categories of gestures that students employ while storytelling and the frequency at which they utilise them. There is a clear need for additional research to thoroughly define and classify these motions.



The main issue addressed by this research is the insufficient understanding of the specific forms and frequency of gestures employed by students while storytelling at SMAN 1 Semaka. Although earlier research has examined the overall advantages of gestures in communication and learning, there is a lack of significant data regarding the precise ways in which students utilise these nonverbal cues in storytelling. The objective of this research is to address this deficiency by conducting a comprehensive examination of student gestures, therefore enhancing our overall comprehension of nonverbal communication in educational settings.

The research aims to achieve two objectives: firstly, to categorise the various types of gestures employed by students while storytelling at SMAN 1 Semaka, and secondly, to quantify the frequency of these gestures. Attaining these goals will yield significant observations regarding the significance of gestures in storytelling, providing a nuanced comprehension of how nonverbal communication can improve narrative abilities and educational results. This study attempts to provide a unique contribution to the current knowledge by focussing on these specific objectives. It seeks to provide educators with practical insights that can be implemented to enhance teaching methods and increase student engagement.

In order to accomplish these goals, this study utilises ELAN software, a specialised tool created for the purpose of annotating and analysing patterns of gestures (Beugher et al., 2018; Ienaga et al., 2022; Lausberg & Sloetjes, 2016). ELAN facilitates meticulous and comprehensive analysis of gestures, empowering researchers to classify and measure the various types of gestures employed by pupils (Beugher et al., 2018; Ienaga et al., 2022; Lausberg & Sloetjes, 2016). This methodological approach guarantees a thorough examination of nonverbal communication in storytelling, yielding data that may be utilised to improve educational methods. The results of this study are anticipated to provide practical and valuable information for instructors, enabling them to develop more impactful storytelling activities and enhance students' proficiency in communication.

Ultimately, this research aims to fill the knowledge gap regarding the utilisation of gestures in storytelling among students at SMAN 1 Semaka. The project seeks to utilise ELAN software to conduct a thorough analysis of gestures, with the goal of identifying the various types and frequency of gestures used. This analysis will provide novel insights into the significance of nonverbal communication in the field of education (Ienaga et al., 2022; Li, 2023). The findings will bolster the progress of instructional tactics, augmenting storytelling proficiency and overall communication aptitude among students.



THEORETICAL INSIGHT

Nonverbal communication (NVC) refers to the transmission of information through means other than words, encompassing facial expressions, gestures, physical movements (kinesics), posture, body adornments, and voice attributes (Dinică, 2014; J. A. Hall, 2001; Mandal, 2014; Phillips, 1993). The meticulous observation and comprehension of an individual's fundamental behaviors are crucial for effectively interpreting NVC. It is essential to identify changes or "indicators" and understand universal patterns of behavior while considering cultural contexts, which can sometimes present challenges to accurate observation. NVC is a fundamental aspect of social interactions, significantly influencing nearly all social experiences. It includes actions of the face, body, or voice that occur without the use of spoken language (Croes et al., 2018; E. T. Hall & Hall, 1986; J. A. Hall et al., 2019). The field of human NVC covers various research areas, including its evolutionary roots, developmental mechanisms, physiological and neurological factors, individual and social uses, variations among different groups (e.g., culture, gender), and the effectiveness of conveying and understanding nonverbal signals. Hall et al. (2019) emphasize that while NVC is commonly described as encompassing everything except words, a comprehensive understanding requires examining the interaction between nonverbal and verbal behavior. For instance, studies have shown that hand gestures used while speaking are part of a unified system for producing speech (Croes et al., 2018; Goldin-Meadow & Alibali, 2013; E. T. Hall & Hall, 1986; Mandal, 2014).

Research also highlights the impact of individual aptitude on the understanding and use of NVC. Studies suggest that various factors influence nonverbal communication abilities, leading to the development of theoretical models that explain how these skills are acquired and why performance varies among individuals (Dinică, 2014; Mandal, 2014; Phillips, 1993). Understanding NVC in educational contexts involves knowledge of key areas such as kinesics, eye contact, paralanguage, classroom environment, proxemics, and physical appearance. According to Berger, NVC plays a substantial role in education by promoting effective communication between teachers and students. The Social Learning Theory and Behaviorism emphasize the importance of observation, repetition, and reinforcement in acquiring nonverbal communication skills, which are crucial for successful learning and teaching outcomes. Nonverbal communication, including gestures and facial expressions, effectively conveys meaning and emotion, significantly influencing learner achievement (Dinică, 2014; E. T. Hall & Hall, 1986; Mandal, 2014; Phillips, 1993). A communication framework aimed at enhancing classroom interaction, such as the one developed



for South African schools, emphasizes that good communication improves student outcomes, while poor communication can lead to misunderstandings and hinder academic progress.

In educational settings, NVC involves the transmission of messages through gestures, facial expressions, and body language without using words. Despite its pivotal role in achieving educational objectives and enhancing teaching effectiveness, NVC is often overlooked by teachers (Cornwell, 1976; Croes et al., 2018; E. T. Hall & Hall, 1986; Wang & Ruiz, 2021). Skillful use of NVC can increase student engagement, improve comprehension, and enhance material retention. Positive nonverbal behaviors, such as smiling, using fluid movements, and maintaining eye contact, can strengthen the teacher-student relationship and facilitate classroom management. Teachers must develop a comprehensive understanding of NVC and proficient communication skills to interpret students' communications effectively and convey positive signals that promote learning while avoiding negative signals that could impede it (E. T. Hall & Hall, 1986; Shrigley, 1985; Wang & Ruiz, 2021; T. Zhang, 2023). Proficient communication abilities are vital for individual development and self-perception, influencing relationships and overall quality of life. Effective communication is essential for success in education, where educators must not only impart knowledge but also foster human connections and model positive attitudes and values within the school community. Humanist education prioritizes these connections, fostering an environment of unconditional love and empathy that facilitates optimal personal growth.

ELAN (EUDICO Linguistic Annotator) software plays a significant role in the practical application of these concepts, particularly in analyzing NVC in educational research. Developed by the Max Planck Institute for Psycholinguistics, ELAN is designed for analyzing video and audio data, enabling users to generate, modify, visualize, and retrieve annotations (Bui & Chong, 2018; Faria et al., 2016; Yu et al., 2009). This makes it highly beneficial for studying language, sign language, and gestures. The process of annotation in ELAN involves establishing tier types and tiers, selecting time intervals, and inputting annotations. The software supports installation, provides manual instructions, and offers assistance via its website. Key concepts within ELAN include annotations (text assigned to specific time intervals), tiers (collections of annotations), types (restrictions placed on tiers), templates (predefined configurations for annotations), annotation files, and media files. ELAN has been effectively used in educational research to facilitate self-analysis and reflection on performance interpretation, allowing for an in-depth examination of classroom interactions. This empowers educators and researchers to proficiently recognize and classify nonverbal behaviors.



In the context of storytelling, gestures play a powerful role in enhancing public speaking and education by increasing interest and improving students' speaking and listening abilities. Effective storytelling involves the use of vocal inflection, intonation, and physical gestures to communicate emotions and create a lasting impression. Gestures complement verbal communication by adding a visual component and conveying messages that words alone cannot express (McNeill Lab Gesture subject). Research indicates that observing gestures while listening to a narrative enhances retention and comprehension of events across all age groups, including children and adults (Alibali et al., 2009; Clough & Hilverman, 2018; Dahl & Ludvigsen, 2014; Kang & Tversky, 2016). Gestures provide specific information, particularly about spatial and motor characteristics, which enhances spoken communication. Combining gestures with vocal elements improves storytelling and aids memory retention. Within educational environments, teachers can use gestures to enhance narratives, thereby increasing engagement and facilitating comprehension. Utilizing methods such as ELAN for gesture analysis can help educators and researchers understand the role of gestures in storytelling, ultimately enhancing students' narrative construction abilities (Alibali et al., 2009; Dargue & Sweller, 2020; Klerfelt, 2007). This literature review highlights the need for further detailed examination of the specific types of gestures students use in storytelling and the frequency of their use, addressing the current gaps in knowledge and providing significant insights into the impact of nonverbal communication on education.

RESEARCH METHOD

This study employs a qualitative research approach to understand human and social phenomena in natural settings. Qualitative research aims to create a comprehensive and intricate depiction of phenomena through detailed views obtained from informants (Aspers & Corte, 2019; Malagon-Maldonado, 2014). Qualitative research utilizes natural settings to interpret phenomena, employing various methods to narratively describe activities and their impacts on participants' lives. This approach is grounded in post-positivism, which is beneficial for studying natural objects rather than experimental scenarios (Ashworth, 1997; Brody, 2005; Patterson et al., 1998).

The research data for this study comprises qualitative data, including detailed observations and descriptions of student gestures during storytelling activities. This data is primarily descriptive, focusing on the types and frequencies of gestures used by students. The primary data



sources are students from SMAN 1 Semaka, particularly those involved in the English Club's Storytelling extracurricular activity. The data includes video recordings of their storytelling sessions, which are analyzed for gesture patterns using ELAN software.

Participants were selected purposively to ensure they represent a relevant subset of the student population. The selection focused on students actively engaged in the Storytelling extracurricular activity, ensuring they had sufficient experience and exposure to storytelling practices. The study included eight students, five from grade 10 and three from grade 11, with one male and seven females, aged between 15.3 and 16.9 years.

The primary research instrument is the ELAN software, a tool developed by the Max Planck Institute for Psycholinguistics for annotating and analyzing video and audio data. This software is used to analyze the recorded storytelling sessions, providing detailed insights into the types and frequencies of gestures used by students (Beugher et al., 2018; Ienaga et al., 2022; Larsson et al., 2021). Data collection involved recording storytelling sessions of the selected students on October 26 and 27, 2023. The sessions were video recorded to capture the full range of gestures used during storytelling. These recordings were then transcribed and analyzed using ELAN software to identify and categorize gestures.

The theoretical framework for this study is based on the principles of nonverbal communication (NVC) and its role in educational settings. NVC encompasses various forms of communication without words, such as gestures, facial expressions, and body language, which are crucial in enhancing verbal communication. The framework incorporates insights from Social Learning Theory and Behaviorism, emphasizing observation, repetition, and reinforcement in learning nonverbal communication skills (Berger, 2017; Dunst, 1978; E. T. Hall & Hall, 1986; Mandal, 2014).

Data analysis was conducted using ELAN software to annotate and examine the recorded storytelling sessions. The analysis focused on identifying the types of gestures used, categorizing them, and determining their frequency. This inductive analysis aimed to derive patterns and insights from the data, emphasizing the meaning of gestures in the context of storytelling rather than generalizing findings. To ensure data credibility, triangulation techniques were employed, combining observations with document analysis (Alibali et al., 2009; Cooperrider et al., 2018; Klerfelt, 2007; Wicke & Veale, 2021). This included cross-referencing the video data with transcriptions and annotations made using ELAN software. Additionally, peer debriefing and member checks were conducted to validate the findings and interpretations, ensuring they



accurately reflect the students' use of gestures in storytelling.

FINDINGS

The use of ELAN software in this study enabled a comprehensive analysis of nonverbal communication, particularly gestures, in the storytelling activities of students at SMAN 1 Semaka. ELAN, a powerful tool designed for studying human language and behavior through the recording, managing, and analyzing of audio and video data, played a crucial role in this research. Its capabilities for adding annotations, labels, and transcriptions, as well as its data visualization features, facilitated an in-depth examination of the students' gestures, focusing primarily on two main types: head gestures and hand gestures, each of which plays a significant role in nonverbal communication.

The analysis revealed that certain head gestures were prevalent among the students. Gestures such as Head Agreement (HA), Head Disagreement (HD), Head Tilting (HT), Head Front (HF), Head Lowered (HL), and Head Raised (HR) were observed, with varying frequencies. Head Agreement (HA), which signifies nodding in agreement, was rarely observed, with a total count of only 16 occurrences across all students. In contrast, Head Disagreement (HD), involving shaking the head to indicate disagreement, showed significant variation among students, with occurrences ranging from 0 to 338. Head Tilting (HT), a gesture often conveying curiosity or confusion, was highly frequent, especially in the story "The Farmer and The Lion," where one student recorded 6,903 instances. However, the most common head gesture was Head Front (HF), which appeared 73,162 times and was predominantly observed in the story "Nina and Two Wishes," showcasing its varied usage in different contexts. Meanwhile, Head Lowered (HL), signifying submission or embarrassment, and Head Raised (HR), indicating attention or confidence, were less frequently observed, with totals of 1,971 and 1,652, respectively.

The study also identified dominant hand gestures that played crucial roles in the students' storytelling. Among the various gestures, Open Hands (OP) and Closed Fists (CF) were the most prevalent. Open Hands (OP), symbolizing openness and sincerity, were observed approximately 49,000 times, with Student 3 demonstrating the highest frequency, around 6,453 instances. Closed Fists (CF), often indicating determination or anger, appeared around 39,000 times, with Student 5 exhibiting the highest usage at approximately 5,690 instances. Other commonly used gestures included Pointing Fingers (PF), employed for indicating direction or giving commands, which were observed around 9,336 times, with Student 5 recording the highest frequency at 1,636



instances. Enumerating Finger (EF), which helps explain order or quantity, appeared 1,869 times, though with notable variation among students.

In contrast, certain hand gestures were observed less frequently, suggesting they play a more specialized role in storytelling. For example, Hands Behind One's Back (HB), indicating self-control or authority, appeared approximately 2,010 times, with Student 6 using this gesture most frequently, around 916 instances. Hand on Chin (HC), often signaling deep thought or evaluation, was recorded 380 times, with Student 8 showing the highest frequency at 183 instances. Additionally, gestures like Hands on Hips (HH) and Hand on Cheek (HCH) were among the rarest, with only 140 and 158 occurrences, respectively. These gestures, along with Hand Crossed (HCR), which was observed 283 times, were seldom used, indicating a lesser role in the students' storytelling repertoire.

Overall, the findings suggest that students at SMAN 1 Semaka tend to favor certain gestures, such as Open Hands (OP), Closed Fists (CF), Head Front (HF), and Head Tilting (HT), to enhance their storytelling. These dominant gestures contribute to the emotional and contextual richness of the narratives, making them more engaging for the audience. On the other hand, gestures like Head Agreement (HA), Hands on Hips (HH), and Hand on Cheek (HCH) were used sparingly, suggesting that these movements are less integral to the storytelling process for these students.

Understanding these nonverbal communication patterns provides valuable insights for educators. By recognizing which gestures are most commonly used and which are less frequent, teachers can tailor their instructional methods to help students develop more effective storytelling skills. For instance, encouraging the use of underutilized gestures could add variety to students' narratives, making their storytelling more versatile and expressive. This detailed analysis underscores the importance of integrating nonverbal communication strategies into storytelling exercises, thereby enhancing students' overall communication abilities.

DISCUSSION

The findings of this study provide valuable insights into the use of nonverbal communication (NVC), particularly gestures, in the storytelling activities of students at SMAN 1 Semaka. These insights align with existing literature on the critical role of NVC in educational settings, reinforcing the idea that gestures are not merely supplementary but integral to effective storytelling and communication (Abner et al., 2015; Akasheva et al., 2018; Sibierska, 2017).



In the context of storytelling, the frequent use of gestures such as Open Hands (OP), Closed Fists (CF), Head Front (HF), and Head Tilting (HT) by students suggests that these nonverbal cues are pivotal in enhancing narrative delivery. This aligns with theoretical insights that emphasize the ability of gestures to animate narratives, convey emotions, and deepen the connection between the storyteller and the audience (Clough & Hilverman, 2018; Cook et al., 2010). The high frequency of these gestures supports the view that nonverbal signals add emotional and contextual complexity to spoken messages, making the storytelling experience more engaging and memorable for the audience (Agan, 2006; Chan, 2021; J. Zhang & Liu, 2022).

However, the study also reveals that certain gestures, such as Head Agreement (HA), Hands on Hips (HH), and Hand on Cheek (HCH), were used less frequently. This observation may indicate that these gestures are less critical in the context of storytelling or that their usage is more situational, influenced by the narrative or the storyteller's personal style. The rarity of these gestures aligns with literature on the diversity of nonverbal communication behaviors, which suggests that the effectiveness and frequency of gestures can vary depending on individual differences, cultural norms, and specific contexts (Andric & Smal, 2012; Novack & Goldin-Meadow, 2015).

These findings underscore the importance of understanding the specific types and frequencies of gestures used by students, which has significant implications for educational practices. As noted in previous research, educators can leverage this understanding to enhance teaching strategies, making them more responsive to the nonverbal cues that students use to express themselves (Berger, 2017; Hall et al., 2019). By recognizing which gestures students naturally use and which are underutilized, teachers can guide students to develop a more diverse and effective repertoire of nonverbal communication skills, thereby improving their narrative abilities and overall communication proficiency.

The use of ELAN software in this study proved invaluable in analyzing NVC in educational research. The software facilitated a detailed analysis, allowing for the precise categorization and measurement of gestures, which aligns with the increasing emphasis on utilizing advanced technological tools to gain deeper insights into human behavior and communication (Beugher et al., 2018; Ienaga et al., 2022; Lausberg & Sloetjes, 2016). This methodological approach reinforces the significance of employing sophisticated tools like ELAN in educational research to enhance our understanding of classroom interactions and student behaviors, ultimately contributing to more effective educational practices.



Furthermore, the study's findings contribute to the ongoing discourse on the role of NVC in education, particularly in storytelling, by providing empirical evidence that supports the integration of nonverbal communication strategies in teaching. The observed use of gestures among students reflects broader theoretical frameworks that advocate for the inclusion of NVC as a key component of effective communication in educational contexts. This research aligns with the principles of Social Learning Theory and Behaviorism, which emphasize the importance of observation, repetition, and reinforcement in acquiring communication skills (Dinică, 2014; E. T. Hall & Hall, 1986; Mandal, 2014). By incorporating these insights into classroom practices, educators can enhance the storytelling abilities of their students, thereby improving their overall communication proficiency.

In conclusion, this study fills a gap in the existing literature by providing detailed insights into the specific gestures used by students during storytelling, while also reinforcing the critical role of nonverbal communication in education. The findings suggest that a more deliberate focus on developing students' nonverbal communication skills, supported by tools like ELAN, could lead to significant improvements in educational outcomes. As education continues to evolve in the digital age, integrating these insights into teaching practices will be essential for fostering more effective and engaging learning environments.

CONCLUSION

This study has conducted a thorough examination of the significance of nonverbal communication, specifically gestures, in the storytelling endeavours of students at SMAN 1 Semaka. The utilisation of ELAN software enabled a comprehensive analysis of both cranial and manual motions, uncovering significant trends and inclinations in the nonverbal communication of the students. The findings highlight the crucial role that gestures play in augmenting storytelling. The students regularly utilised gestures such as Open Hands (OP), Closed Fists (CF), Head Front (HF), and Head Tilting (HT) to effectively communicate emotions, emphasise essential points, and actively involve the audience. These gestures not only enhance the narratives by providing more complexity and substance, but also mirror larger trends in nonverbal communication that are essential for effective storytelling.

The study also discovered infrequently employed gestures, such as Head Agreement (HA), Hands on Hips (HH), and Hand on Cheek (HCH), indicating that these movements may be less crucial in storytelling or may be used selectively depending on the narrative or the storyteller. The



observed heterogeneity in the use of gestures is consistent with previous studies on nonverbal communication, which highlight the wide range and situational nature of nonverbal behaviours. The findings have important consequences for educational methods. Comprehending the precise movements that students instinctively use while narrating stories might assist educators in formulating more efficient teaching tactics that utilise the influence of nonverbal communication. Teachers can strengthen students' narrative ability and overall communication skills by promoting the utilisation of a wider array of gestures. This will result in more captivating and efficient learning experiences.

Furthermore, this study emphasises the need of utilising sophisticated technical tools such as ELAN in educational research. The comprehensive analysis given by ELAN gives profound insights that beyond conventional observational approaches, facilitating a more intricate comprehension of student behaviours and interactions. In order to cultivate more dynamic and responsive educational settings, it will be crucial to include these technologies into research and practice as education continues to develop.

Ultimately, this study adds to the expanding collection of scholarly works on nonverbal communication in the field of education, offering significant perspectives on how gestures might be utilised to enhance students' narrative and communication abilities. By incorporating these discoveries into instructional methodologies, educators can more effectively assist students in cultivating the essential nonverbal communication skills necessary for their academic and personal achievements.

FUTURE DIRECTIONS

Future research should explore the role of social learning in educational settings, focusing on antithetic and synthetic exchanges. This will help educators identify imbalances in interactions and guide discussions more constructively, ensuring students engage in a balanced and productive manner. Additionally, understanding the indirect effects of students' social identity and perceptions of educational programs on academic performance can provide valuable insights into motivation, engagement, and effective study strategies. Comparing social media-based learning with traditional learning environments is also crucial, as social media platforms offer advantages over conventional settings in terms of access to diverse experiences and knowledge. By examining the benefits and drawbacks of social media learning, researchers can provide evidence-based recommendations for educators on how to effectively incorporate these tools into their teaching



strategies. In conclusion, future research should refine educational frameworks, understand broader social factors influencing academic performance, and evaluate the efficacy of social media as a learning tool, contributing to more effective and responsive educational practices that better support students' learning and growth.

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