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THE EFFECT OF GESTURES ON THE COMMUNICATION AND EDUCATIONAL PROCESS

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Abstract

A gesture is a mode of establishing communication. In order for a movement to be a gesture, it has to convey a message or a piece of information. Different designations of a gesture are linked to both verbal and nonverbal communication. A gesture conveys information either on its own or together with speech. The main goal of the study is to point to the characteristics of gestures, the acquisition of gestures, as well as to the effect of gestures on the communication and educational process through the overview of the available literature. The methods of the analysis and the evaluation of the available literature were applied. Data on the specific features in the development of gestures, the classification and the role of gestures in the communication process and the process of education was gathered. A gesture represents an initial communicative symbol, which is used at an early age so that a need or a meaning is expressed. The decoding of nonverbal signals or transferring of a part of communicative intention to the modality of a gesture can compensate for the unfamiliarity with vocabulary or an inability to produce speech. When complex notions are presented in concrete terms or when the significance of any topic is emphasised, gestures and body language play a key part in the educational process. Gestures have a significant effect on the process of learning new terms as well as on the process of communication, thinking, learning and education.

Key words: gesture, communication, learning, education.

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УТИЦАЈ ГЕСТА НА КОМУНИКАЦИОНИ И ОБРАЗОВНИ ПРОЦЕС

Апстракт

Гест је начин успостављања комуникације. Да би неки покрет био гест, он мора да преноси поруку или информацију. Различита одређења геста се везују и за вербалну и за невербалну комуникацију: гест преноси информације или самостално или уз говор. Основни циљ рада је да се прегледом доступне литературе укаже на карактеристике геста, усвајање геста, и утицај геста на комуникациони и образовни процес. Примењене су методе анализе и евалуације релевантне доступне литературе. Долази се до података о специфичностима и развоју гестова, те класификацији и улози гестова у процесу комуникације и едукације. Гест представља први комуникативни симбол, који се користи на раном узрасту да би се изразила потреба или значење. Непознавање речника или неспособност да се произведе говор може се надокнадити декодирањем невербалних сигнала или преношењем дела комуникативне намере на модалитет геста. При представљању сложених појмова у конкретним терминима или наглашавајући значај било које теме, гест и говор тела играју кључну улогу у васпитно-образовном процесу. Гестови имају значајан утицај на учење нових појмова, као и на процес комуникације, мишљења, учења и образовања.

Кључне речи: гест, комуникација, учење, образовање.

INTRODUCTION

A gesture relates to the movements of arms which are synchronised with speech. They are usually used together with spoken language in human communication. The research on the use of gestures has been conducted from different perspectives and using different approaches, each with a different objective. In the field of linguistics, psychology and social science, the research into gestures mainly focuses on the connection between language and human thoughts. Researchers in the field of neuroscience and neurolinguistics are interested in studying gestures which accompany oral production and their neural correlates. In the discipline of communication science, such as studies which include speakers suffering from aphasia or hearing impairment, research scientists study the relations between gestures and impediments in spoken language. Scientists with experience in computer science and computer engineering have pointed to different methods and algorithms for the identification of movements in real time as well (Kong et al., 2015). Cartmill (2022) points out that when we speak, we use gestures spontaneously, and those movements are temporally and semantically integrated with the spoken acts they accompany. A gesture is also present when speech is absent: prelinguistically and in situations when speech is impossible or is without deliberation. A gesture is a strong and manifold phenomenon which comprises almost all spheres of human life. The study of gestures is almost as diverse as gestures themselves. The main purpose of gestures is to assist in communication. How-

ever, apart from being necessary for communication, gestures also have a significant effect on thinking, learning, understanding language, and education (Chu & Kita, 2016). People produce gestures spontaneously while speaking and thinking. Gestures play an important part in communication (Hostetter, 2011), when speech and a gesture jointly express the speaker's message in a coordinated manner (Kita et al., 2017).

GESTURES

Gestures help in communication in several ways: they replace speech; they assist in the regulation of the two-way flow of interaction; they draw and hold attention; they emphasise speech; and they help in making speech memorable. Gestures are also used when participants in interaction are not visible (over the telephone), but they are more frequent when participants in interaction can see each other. Gestures are used increasingly when: participants in communication are informed about the topic that is being discussed; when they are motivated to have the listeners understand the message; when they attempt to be dominant in the conversation; when they are excited and enthusiastic about the topic which is being discussed; and when manual activities are being discussed. The absence of gestures affects speech and the understanding of the listener. Gestures and speech are different external manifestations led and controlled by the same part of the brain. Both gestures and speech have a part in communicating the same content (Morris, 2002).

A gesture is an expressive movement which is made by means of the whole body or the head, the arms or the fingers only, and which has a symbolic meaning. In verbal and nonverbal communication, various gestures are commonly used as signs (accompanying other or used on its own) (Trebješanin, 2004). A gesture is defined as the use of various movements during speech, a play with expressive movements, or speech using signs. Dimić (2002) points out that a gesture is a movement of the body, especially the arms, by which a spoken expression is accompanied. It maintains a psychological reaction and serves as a sign of understanding, a warning, or an admonishment. It is manifested with the movement of the arms and body, or facial expressions. A gesture is defined as an action by means of which a thought, a feeling or an intention is given conventional and voluntary expression. Gestures are defined as the movements of the body (or one of its parts), the task of which is to convey an idea, an intention or a feeling (Knapp & Hall, 2010). Givens (2013) asserts that a gesture is a nonverbal sign: a movement of the body, a stance, or a material artefact which encodes or affects a concept, motivation or mood; in the most general sense, a gesture is a sign or a signal which is used to communicate with words or without them. Gestures include facial expressions, movements and posture. A gesture is a conscious or unconscious movement which is mainly made

with: the head, the face, or the limbs, which is acquired or somatogenic, and which serves as a primary communicative tool, related or unrelated to verbal language, used simultaneously or alternating with it, shaped by the given (conditioning) surroundings. A gesture (including facial expressions) is defined as a movement and/or a position of the parts of the human body functioning as communication tools. A gesture is each action which sends a visual sign to an observer. A gesture is a manner of establishing communication, and in order for a movement to be a gesture, it has to convey a message or a piece of information. In order for this act to become a gesture, somebody else apart from the one performing it should see it, and thus receive at least a part of the communicated information. Gestures represent the motor and communicative use of certain parts of the human body. Žikić (2002) studied gestures as symbolic aspects of communicative segments which were created by certain parts of the human body being used in particular manners. This use was determined by a cultural framework defined by a community in which such communication is taking place.

THE EFFECT OF A GESTURE ON HUMAN COMMUNICATION

Communication is a dynamic process within which information is conveyed through symbols. It can run successfully only under the condition that the signs which hold the meaning for the participants in communication are used. The standard manner of communication among people is speech. However, in social communication the use of the arms, the face and the entire body is also common. In certain situations, oral and vocal speech can be neglected and only kinetic speech can be used (e.g. in conditions of intense noise) (Isaković & Kovačević, 2015). Nonverbal communication represents a primary communication model, but as is the case with verbal communication, it is controlled by a certain system of codes which are culturally determined (Kelmaganbetova et al., 2023). Using the phatic function of nonverbal communication can be a strategy for speakers to use their own facial expression and/or gestures, so as to give feedback information to their interlocutor on their reaction to the perceived communication process or, vice versa, to interpret whether the communication is successful or not by decoding the nonverbal behaviour of their interlocutor (Sutiyatno, 2018). Nonverbal communication is defined as the communicative functioning of the body activity, gestures, facial expressions, postures and spatial positions.

Clough and Duff (2020) indicate that people from all known cultures gesture, and that a gesture is fundamental to communication. Babies gesture before they produce their first words (Goldin-Meadow & Alibali, 2013). Gestures have numerous functions. They can replace speech (in a dialogue or when speech is not used at all), regulate the course and rhythm of interaction, give significance to speech, and help speakers in their ap-

proach and in formulating speech. Speech and gestures are closely related and everybody would find it difficult to completely refrain from gesturing over the course of a long conversation. Even if that were possible, it would not be recommendable, as a gesture has an important role in communication (Knapp&Hall, 2010). Gestures, facial expressions, and body posture are in correlation with the speech act (Badler et al., 2000). Gestures, synchronised with the accompanying vocal/verbal course of the conversation, increase understanding. This is achieved through the functions of gestures, such as: bringing ideas to life; highlighting attitudes; and keeping the attention and focus of the listener and marking the organisational structure of the conversation. In the research conducted by Krauss et al. (1995, 1996), it has been observed that gestures related to speech help listeners' understanding by directing attention and activating images or motor representations in listeners' minds, or by facilitating remembering. Generally, the relation between a gesture and speech is most often described as the gesture being able to fully replace speech or to complement it. The categorisation of gestures within nonverbal communication exclusively is considered inadequate in contemporary research. A gesture is a nonverbal act by itself, but it does not have to be so necessarily, and most often it is not a part of nonverbal communication completely. The coordination of speech-body movements between two interlocutors – as a form of social rhythm as well as behaviour is studied in two ways: *matching* – human beings normally have a tendency to imitate facial expressions, body posture and other ways in which people they interact with behave; and *networking* – another way of studying the phenomenon of interaction synchronisation is the observation of the simultaneous occurrence of changes in the movement and the voice of both participants in the interaction. The changes relate to starting, stopping, speed and/or the course of behaviour that is being studied. Knapp and Hall (2010) maintain that, although gestures are difficult to define, we can differentiate the movements which a person makes in order to communicate from the movements which are solely nervous mannerism – expression linked to emotions and movements focusing on a task.

THE DEVELOPMENT OF GESTURES IN CHILDHOOD

Research has shown that visual and linguistic processing with children commences at an earlier age than auditory processing, and studies of early gestures – indicating/pointing and crossing arms with very small children (up to one year of age) have confirmed the hypothesis that indicating/pointing is a universal and primary means of communication and that it is important for linguistic development (Tomasello et al., 2007). Indicating/pointing occurs at the age of nine months, but it is not integrated with vocal activity up to the age of 14 months. Vygotsky (1996) asserts that this gesture stems from a child's attempt to reach an object in his or her

mother's presence. Babaei et al. (2018) point out that human beings are social and have a strong tendency to communicate even in the first months of their lives. This communication may have different communicative functions, such as regulation of behaviour, social interaction and joint attention (Özçaliskan & Dimitrova, 2013). Babies use different gestures to communicate with others. As children grow up, they begin to develop communicative skills, and they usually start to use gestures as communicative symbols when they are around 8-9 months old (Capone & McGregor, 2004). In that period, children develop deliberate communication, and they use gestures to satisfy their needs. Indicating is one of the main gestures by which a finger is pointed to something. It enables a child to communicate with others before it acquires verbal skills.

Lüke et al. (2020) indicate that pointing gestures are one of the initial tools of deliberate communication and a subtype of deictic gestures, which are used for and relate to something (mainly) in the immediate surroundings. Babies start to use demonstrative gestures in the second half of the first year of their life, and they often do that even earlier, starting from the production of words. Firstly, babies use the so-called whole-hand pointing, in which the arm and hand are extended towards the signifier, followed by index finger pointing, in which the hand and index finger are clearly extended towards the signifier. Based on a large number of studies, it is indisputable that the production of pointing gestures is a strong predictor for later linguistic skills. The research done by Petitto & Marentette (1991) has shown that the manual babbling of infants (instead of oral babbling) precedes language learning. Several other studies have shown that children use more and more gestures as they grow up, in the same way as they use more and more words, while the nature of gesturing varies with the variable nature of speech production. There is an increasing number of studies which suggest that the production of gestures in children is linked to language development. Small children communicate using gestures prior to communicating using speech (Rowe et al., 2022). Deictic gestures, i.e. pointing, arise first, and they are the most frequent in a child's production (Ozcalıskan et al., 2016). At the age of two and three, the system of gestures continues to develop, and emblems and iconic gestures appear. Discourse gestures and abstract pointing are the last to develop as they require that a child should be able to understand metalinguistic and metanarrative language features. These gestures arise at around the age of five and they do not develop fully until the age of 11.Pointing gestures may be also be used as declarative and imperative speech acts, and both types of pointing occur before children start to use spoken language. Imperative pointing can be used so that an adult would be prompted in a certain way to handle a toy. However, declarative pointing is described as directing the attention of the interactor to the object. Capirci et al. (2005) studied the relation between gestures and language development with three children ages 10 months

through 2 years, where they discovered that all children began to communicate during the first session, mostly using gestures. However, as the children grew older, the speech became the preferred modality of communication. In their research, Acredolo and Goodwyn (1996) came to the conclusion that four-year-old boys and girls had understood and correctly decoded several gestures unrelated to speech before they actually used them in their interactions. The results of the research showed that children had correctly decoded the emblems for: 'yes;' 'no;' 'come here;' 'silence;' 'goodbye;' 'two;' 'I am sending a kiss;' and 'I am going to sleep.' Children who have not learnt to speak yet can effectively use between 10 and 60 gestures – signs for communication. Kinesic elements have profound significance in communication with children of preschool age, especially in the period before language is fully mastered. Over time, children learn to interpret and react to other person's gestures, facial expressions and movements (Kovačević and Isaković, 2019).

THE CLASSIFICATION OF GESTURES

Analysing gestures in all their variants and uses, Morris (2002) emphasised that the task of gestures was to send signals, which is why they should, above all, be obvious to those to whom they are directed. For this reason, their form should be typical so that there would be no deviation and that they would not be confused with some other. Despite the fact that they may have a symbolic meaning, their message must always be clear and unambiguous so that it would be understood correctly. They most usually represent a social convention and they are conveyed within a certain tradition and culture, which is why the very gestures have universal meaning, unless expressive ones are in question. One of the most influential classifications of gestures has been provided by Ekman and Friesen (1969, according to Janićijević, 2007; Kong et al., 2015), and it contains five categories of nonverbal behaviour. *Emblems* are conventional, deliberate signs which are autonomous in relation to language. These gestures can be understood directly, like the finger on the mouth signifies silence or waving a hand signifies a greeting. Nonetheless, as is the case with the gestures themselves, gesturing emblems are limited to specific cultures. Gesturing emblems in everyday life may replace certain words or sentences. They may be used differently, and thus it is not a question of a certain system. They depend on a convention, and for that reason we do not consider them to be codes. *Illustrators* are gestures which are related to speech and they serve to illustrate what is being said. Illustrators represent a complement to words, such as when speech accompanies gesturing with arms. Ekman distinguishes between several subtypes of illustrators, such as: *batons*, i.e. gestures that emphasise certain words or sentences; *ideographs*, gestures which hint the course of thought; *kinetographs* which portray actions; *pic-*

tographs showing objects; *beats* which depict the rhythm or the pace of a certain event; *spatials* depicting space; and *deictics* pointing to objects. Batons can have only an expressive function, while all other illustrators have an index or iconic function to which they relate. The semantic connection between language and illustrators can be emphasis, replacement, complement or contradiction. *Affective displays* are nonverbal expressions of emotions and affects. They most usually refer to a facial expression which shows us what somebody is feeling, such as a smile or frowning. *Adaptors or body manipulators* help a personality to address or point to some personal problems or events (scratching, hitting the hand against the table etc.). Such acts of subconscious autocommunication are interpreted as adaptive efforts to satisfy personal or bodily needs, or to settle emotions. This is the way in which information on one's very personality is given rather than it being a matter of simply conveying a message. *Regulators* are gestures which are related to speech and they regulate the spoken interactions between a speaker and a listener. Their function is above all phatic. Gestures with the head and the body, and the direction of the body thus point to the wish of the speaker for approval or hint that he or she will start to speak.

Knapp and Hall (2010) cite one of the most common classifications (divisions) of gestures – that is, the division into speech unrelated gestures and speech related gestures. *Speech unrelated gestures* are called emblems or autonomous gestures. They are nonverbal activities which have a direct verbal translation or a definition in a dictionary, and they usually consist of one or two words or phrases. There is strong agreement among the members of a certain culture or subculture on the verbal translation of these signals. The meaning of such gestures is the least related to speech and they often appear as separate gestures. Children are able to decode some of these speech unrelated gestures starting with the age of three, and that ability improves dramatically by the age of five. One of the most famous theoretical notions used in the analysis of gesture is Kendon's continuum, along which different forms of gesture are plotted between natural gesticulation and full-formed linguistic codes, such as Sign Language (Jagoe & Wharton, 2021). Kendon (1988) classified gestures according to the degree of their conventionalisation as well as by how closely they are related to speech in the form of a continuum: spontaneous gestures which Kendon calls gesturing are at one end. These gestures have not be conventionalised and are not accompanied by speech. Further in the continuum, where the need for simultaneous speech is reduced, facial expressions and emblems, as more conventionalised categories, are to be found. Sign languages which have been fully conventionalised in the complete sense of that word, as well as spoken languages (gesturing → pantomime→ an emblem → a sign language) are at the other end of the continuum. It is in this sequence, starting from gesturing and ending with sign language, that the independence

from the accompanying speech medium as well as the presence of formal linguistic significance increase, and freely formed gestures are replaced with socially regulated signs in the same sequence. McNeill (2000) names it Kendon's continuum. Gesturing is made of spontaneous movements of the arms which accompany spoken communication, and which are always a free individual creation. It is to be found at the beginning of Kendon's continuum. What follows are pantomimic gestures which are performed without the presence of speech and which are not coded into a separate language. Emblems are a type of gesturing signs of a widely recognisable conventional meaning, which are understandable independently of the accompanying speech. Emblems are significantly culturally marked and, as a rule, they are replaceable with a clear verbal translation. Emblematic signs may differ more or less in both expression and the content which they convey in different cultures. The most frequently cited emblem is the so-called OK sign, which is the sign for excellence in the majority of Western European countries, and which is formed with the index finger and the thumb joined into a circle. Being at the very end of the continuum, sign language is the gesture code made of conventional, analytically organised and hierarchically structured signs, which makes it comparable with natural languages (Žikić, 2002). *Gestures related to speech* are sometimes also called illustrators, and are directly linked to or accompanied by speech. The meaning and the function of such gestures is revealed by examining the way in which they are linked to the present spoken language. A spoken language is an innate human skill and it represents the most widespread manner of social communication. The ability to share notions, intentions and feelings, as well as to react to what others feel/speak is crucial in social interaction. Increasing evidence suggests that language has evolved from manual gestures, gradually incorporating motor actions with vocal elements (De Stefani & De Marco, 2019). In attempts to classify different types of gestures related to speech, different terminology has been used (McNeill, 2000), but four general types have arisen: gestures connected with the speaker's signifier (a concrete object or a notion which is signified by a word or a symbol); gestures which show the speaker's relation with the signifier; gestures which serve as a visual sign of punctuation in the speaker's discussion; and gestures which help in the regulation and the organisation of the spoken dialogue of two persons in the interaction. Roth (2001) cites different taxonomies of gestures (Ekman & Friesen, 1969; Kendon, 1988; McNeill, 1992; Rime & Schiaratura, 1991; Vundt, 1973, according to Roth, 2001). Their classifications of gestures are based on certain functions of movements, or on gesture production models. The majority of researchers, especially those who tackle educational issues, now ground their work on the taxonomy proposed basically – the arm and the mind: what gestures reveal about a thought, according to which there are four basic types of gesture – iconic, metaphoric, rhythmic, and deictic.

Iconic gestures illustrate the semantic meaning of the stated content, and metaphoric gestures are used for the abstract and illustrative representation of concrete objects and phenomena. Rhythmic gestures are used for the representation of an activity or rhythm, and deictic gestures are used to signify conversational space (Goldin-Meadow, 1999).

THE USE GESTURES IN EDUCATION

Gestures can be used with children of typical development, deaf and hard of hearing children, children with autism or developmental disabilities, such as Down's syndrome, Cri du Chat Syndrome and cerebral palsy. Toth (2009) concludes that children with autism and linguistic disorders show better communication skills with the use of gestures. Children have their needs expressed and satisfied more easily through a gesture - a sign. Sign language is visual and easier to use for preverbal children and individuals with developmental disabilities (Bowman-Smart et al., 2019). Learning gestures and sign language offers significant cognitive benefits: the use of speech-accompanying gestures, which are produced in parallel to speaking, is improved (Casey et al., 2012),the ability to perceive a facial expression is improved (Bettger et al.,1997), the development of vocabulary and literacy with small children is stimulated (Daniels, 2004; Moses et al., 2015) and spatial cognition such as mental rotation is enhanced (Romero Lauro et al., 2014, according to Kovačević, 2022). Kovačević and Isaković (2023) point out that the significance of early knowledge of gestures and sign language of deaf and hard of hearing children facilitates the acquisition of notions as well as lip reading. The results of research conducted by Kovačević and Isaković (2020) show that children responded to a pronounced notion with an adequate sign, and showed a higher degree of understanding of what was said than children of preschool age who did not use a sign (a gesture).

Chytas et al. (2023) indicate that the educational use of gestures, i.e. movement of the arms or other parts of the body is a method which proved to be efficient, while it led to satisfactory acquisition and retention of knowledge. Gestures are a form of embodied learning, i.e. learning through the interaction of the body with the surroundings, which has a potential for learning based on neuroscientific evidence, and for which it has been established that it facilitates visualisation. Gestures facilitate the working memory process in acquiring information. The use of gestures led to positive educational outcomes in different educational areas and subjects. Kovačević and Đoković (2023) state that within artistic activities, preschool children of typical development gesture, make movements, jump, draw and paint before developing skills of correct spoken communication. Art is a visual language with receptive and expressive components in which ideas are communicated without the need to be verbally expressed (Eubanks,

2011). Cook (2018) underlines that gestures produced in the context of learning affect the educational process. The improvement of learning related to gestures has been observed in different domains and at different ages. A gesture is related to the enhanced memorising of sentences, increased conceptual understanding and the improvement of the narrative structure (Macoun & Sveller, 2016).

Khatin-Zadeh et al. (2022) point out that gestures have a role in the process of development and learning new terms. The benefits of learning gestures have been observed in learning mathematical concepts. Cook (2018) emphasises that there is plentiful evidence which reveals that gestures may incite the learning of new words. Dimitrova et al. (2017) are of the opinion that understanding gestures remains poorly studied, especially with children with autism spectrum disorder, who encounter difficulties in creating gestures. De Marchena et al. (2019) have observed and examined the use of gestures with adults with autism. The adults with autism more often gestured unilaterally rather than bilaterally, which is the motor characteristic of the individual gesture related to the symptoms of autism. In their study, Wray et al. (2017) endeavour to establish whether children with linguistic disorders use gestures to make up for their linguistic difficulties. The research made it possible to reveal that gestures and language made a closely related communication system in which the deficits of gestures could also be seen along with the difficulties in spoken communication. The use of gestures by teachers consciously and unconsciously affects students and the learning process. The use of gestures by teachers may improve the understanding of learning content with children. Using incorrect gestures or too many gestures may divert their focus in the educational process and make their learning process more difficult. It is necessary that teachers should understand that certain gestures should be used more and some less so that better atmosphere for learning would be created. Afdaliah (2022) examined the functions of gestures and the effect of teachers' gestures on students of typical development. Gestures were studied within the process of learning the English language as a foreign language. The results of this research revealed that teachers had made gestures with their arms and head. Arm gestures included pointing, calling, giving examples, clapping hands, knocking on the table, hitting the board, illustrating and numbering. In contrast, as regards head gestures, they nodded and shook their heads. The teachers mainly used gestures in terms of directing, regulating, entering and instructing. One of the teachers used head gestures in combination with a smile when he rewarded students and showed them affection. These gestures of the teachers were primarily used in conjunction with words or verbal messages (gestures related to speech) so as to complement, emphasise or repeat words. On the other hand, a small number of gestures is also used to replace words. These gestures are independent or are called speech unrelated gestures. Gestures synchronised with the vocal/verbal

course of a conversation increase understanding. This is achieved through the functions of gestures, such as: bringing ideas to life, highlighting attitudes, keeping attention and focus of the listener, and marking the organisational structure of the conversation. Gestures stimulate learning. The use of gestures with teachers encourages the production of gestures with children.The movements of pointing and following which teachers use to point to the symmetry of shapes help preschoolers to learn the concept of bilateral symmetry. Gestures enable the understanding of abstract notions and lessons. Novack and Goldin-Meadow (2015) state that movements can be used for presenting an idea which is difficult to demonstrate (e.g. using hands to present molecules which are otherwise too small to be visible).Considering the fact that a gesture is a body act, its effects on learning may result, at least partially, from its ability to engage the motor system (Ping et al., 2014). Motor experience shapes learning in different domains. Walkington et al. (2019) point out that gestures play a key part in mathematical reasoning, since they are an indicator that mathematical reasoning is embodied – inherently linked to an action, perception and a physical body. While cooperating and participating in a mathematical discussion, students use the practices of a discourse such as explaining, refuting or developing each other's opinions, frequently using speech and gestures during the conversation (Freitas & Andrade Neto, 2023). Wakefield et al. (2019) examined whether gestures help students learn or direct their visual attention during the teaching process. The authors state that it is possible to acquire new mathematical terms through gestures when the movements of the arms accompany speech. It has been observed that children who attend lessons in mathematics within which gestures are used distribute their visual attention differently from children attending lessons in mathematics without gestures. They analyse the problem which is being explained more, they look at the teacher less and they synchronise their visual attention with the information presented in the teacher's speech more. Sutiyatno (2018) indicates that the way in which teachers communicate with students is one of the numerous factors which help in carrying out an efficient educational process. Verbal and nonverbal straightforward behaviour of teachers improves the positive and efficient teaching interaction, which has a direct effect on the attitude of students to the teacher and the subject, and their readiness to learn. Bedir and Daskan (2023) point out that education is the process of communication. In the process, body language plays an important part. Teachers should study gestures and signs of the body language of their students, and endeavour to improve themselves in this area. Teachers who use body language efficiently and understand it have more productive interaction with their students.

CONCLUSION

A gesture is a strong and complex phenomenon, which comprises almost all spheres of human life. It is an expressive movement made by the whole body or by the head, arms and fingers only, and it has symbolic meaning. In verbal and nonverbal communication different gestures are often used as (accompanying or independent) signs. A gesture has different functions in the communication process. The effect on thinking, understanding of language and education is also significant. Gestures which are synchronised with the accompanying spoken course of the conversation increase understanding by bringing ideas into life, highlighting attitudes, and keeping the attention and focus of the listener. A gesture is also present in the absence of speech – prelinguistically, and in situations when speech is impossible or is without deliberation. Even before developing speech, children communicate with gestures. A gesture then encourages learning new terms which are abstract and more complex. The results of a large number of studies imply that the production of gestures with children is linked to the development of language. The arm movements in the educational process may direct children's attention and verbal information. The relation between gestures and speech is most frequently described in the way that a gesture can replace speech completely or complement it. Gestures are conveyable, flexible and ideal for the improvement of the context of learning. The use of gestures has led to a positive educational outcome in different educational areas and subjects.

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УТИЦАЈ ГЕСТА НА КОМУНИКАЦИОНИ И ОБРАЗОВНИ ПРОЦЕС

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Резиме

Гест је начин успостављања комуникације. Да би неки покрет био гест он мора да преноси поруку или информацију. Различита одређења геста се везују и за вербалну и за невербалну комуникацију: гест преноси информације или самостално или уз говор. Истраживања о употреби геста су спроведена из различитих перспектива и приступа, сваки са различитим циљевима. Када говоримо, спонтано користимо гестове, а ти покрети су временски и семантички интегрисани са говором који прате. Гест се јавља и у одсуству говора: прелингвистички, и у ситуацијама када говор није могућ или је непромишљен. Комуникативна функција геста је везана за говор, за његово одсуство или присуство. Основна сврха гестова је да помогну у комуникацији, али имају и значајан утицај на размишљање, уче-

ње, разумевање језика и образовна постигнућа. Основни циљ рада је да се прегледом доступне литературе укаже на карактеристике и усвајање геста, класификације геста, као и утицај геста на комуникациони и образовни процес. Различити аутори дају различите класификације гестова. То је подела на: гестове независне од говора и гестове повезане са говором; затим разврставање гестова према степену њихове конвенционализације, као и према томе колико су блиско повезани са говором, у виду једног континуума: на једном крају су спонтани гестови који се називају гестикулацијом, а на другом крају континуума су знаковни језици, који су потпуно конвенционализовани језици у пуном смислу те речи, као и говорни језици. Неке класификације гестова засноване су на одређеним функцијама покрета или на моделима продукције гестова. Већина истраживача, посебно оних који се баве образовним питањима, заснивају свој рад на таксономији предложеној у основи-рука и ум, тј. шта гестови казују о мислима. Приликом представљања сложених појмова, или наглашавању неке теме, гест и говор тела играју кључну улогу у васпитно- образовном процесу. Гестови имају значајан утицај на учење нових појмова, као и на процес мишљења и разумевања.Њима се може заменити говор, регулисати ток и ритам интеракције говорника и саговорника, може се одржавати пажња, допринети јаснији и значају говора, говор се може учинити памтљивијим, а и помоћи говорницима у формулисању говора. Гест представља први комуникативни симбол, који се користи на раном узрасту да би се изразила потреба или значење. Гест се може користити са децом уредног развоја, са глувом и наглувом децом, и децом са различитим сметњама и поремећајима у развоју. Многи аутори закључују да деца са поремећајима из спектра аутизма и језичким поремећајима показују боље комуникацијске вештине уз употребу гестова. Гестови и језик знакова им омогућавају да комуницирају и изразе потребе, жеље или мисли када то нису у могућности путем говора. Побољшање учења повезаног са гестовима примећује се у различитим доменима и на различитим узрастима. Гест је повезан са побољшаним памћењем реченица, при учењу нових појмова, у усвајању математичких појмова. Наглашава се и употреба гестова од стране наставника, који свесно или несвесно утичу на ученике и процес учења, што може побољшати разумевање градива код деце. Наставници треба да проучавају гестове и знакове говора тела својих ученика и да настоје да се усавршавају у овој области. Наставници који ефикасно користе и разумеју језик тела имају и бољу интеракцију са својим ученицима.