THE EFFECTIVENESS OF NON-VERBAL COMMUNICATION IN THE STUDENT–TEACHER INTERACTION AND IN THE STUDENT–COMPUTER INTERACTION THROUGH ARTIFICIAL INTELLIGENCE

EFEKTIVITETI I KOMUNIKIMIT JOVERBAL NË NDËRVEPRIMIN NXËNËS –MËSIMDHËNËS DHE NË NDËRVEPRIMIN NXËNËS-KOMPJUTER PËRMES INTELEGJENCËS ARTIFICIALE

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Abstract

Digitalisation and artificial intelligence have created new opportunities for communication, collaboration and the personalisation of learning. In this context, the role of the teacher does not disappear, but changes: from a transmitter of information, they become more of a leader, facilitator and mentor. The subject of this paper is to study the role, function and effectiveness of non-verbal communication in pedagogical interaction (student–teacher) and in student–computer interaction through artificial intelligence. The paper is both theoretical and empirical. The aim of the paper is to study students' thoughts and attitudes through their perception of the opportunities and limitations of artificial intelligence in interpreting emotional cues and in creating interaction with the user during non-verbal communication in the classroom in student–computer interaction. – teacher–student interaction and student–computer interaction. The aim of our study is to examine the impact of both forms of interaction on non-verbal communication in learning and content comprehension. In the study we used the survey technique and a student questionnaire as an instrument to collect and statistically process research data, involving students from the Faculty of Pedagogy, study programmes: Classroom Teaching, Professional Pedagogy and Preschool Education) and students of the Faculty of Mathematical and Natural Sciences (FMNS) – the Informatics programme, in their second and fourth years. There is an important distinction that must be emphasised in this paper: in human interaction, non-verbal communication is natural, whereas in the student–computer interaction it can be presented through visual and audiovisual signals and elements simulated by Artificial Intelligence.

Keywords: student, teacher, communication, artificial intelligence, education.

Introduction

Digital technology and artificial intelligence have brought significant changes to pedagogical communication. They enable new forms of communication, collaboration, access to information and personalisation of learning. However, I believe that technology should be used with pedagogical purpose and in an ethical manner. Artificial intelligence can be a useful tool for research, ideation, feedback and learning support, but it should not replace human communication, critical thinking and the role of the teacher. Therefore, in my teaching I aim to use technology as a tool that enriches pedagogical communication, rather than as a substitute for the teacher–student relationship. The comparison between student–teacher interaction and student–computer interaction via artificial intelligence (AI) in non-verbal communication is a very interesting issue.
In this scientific research, I aim to analyse contemporary communication problems in education and to contribute to the development of more effective pedagogical practices.

Our primary focus is on pedagogical communication and its role in creating a collaborative, inclusive, and student-centred learning process. In my academic work, I address communication not merely as the transmission of information, but as an interactive process that influences motivation, active participation, the development of critical thinking and the creation of healthy pedagogical relationships.

1. Non-verbal communication in the student-teacher interaction

Non-verbal communication is realised through various gestures, facial expressions and bodily movements, which shows that in these cases the non-verbal apparatus is utilised. Thus, non-verbal communication is a kinetic form of communication. The term (concept) 'kinetic' (from the Greek word kinesis) means movement (Chokrevski T., 2000: 211), whereas its units are called kinemas, similarly to phonemes and morphemes in language, which indicates that the message is conveyed through bodily movement, facial expressions and sounds. Jan Robertson (Jan Robertson) treats non-verbal communication as a form of communication that involves the exchange of information through non-linguistic symbols. Some aspects of this communication appear in the form of body language, including facial expressions and physical gestures (Tonovski Ĝ., 1999: 30). According to him, this type of communication develops in two important forms: body language and interaction with the physical environment between individuals.

Non-verbal communication can serve as a substitute for verbal communication, through which we express our feelings and attitudes as well as our personality traits. It is primarily concerned ith the rapport aspect and is influenced by the unconscious part of our personality; thus, in most cases we express the unconscious contents of our psychic life through non-verbal communication.

Often we are not aware of the movements we make, our facial expressions, especially those of the eyes, the tone of our voice, spatial distance, and so on. We also communicate through the way we dress, our physical appearance, facial expressions, eye movements, bodily movements, touches, scent, and so on. As a rule, emotions are expressed more through non-verbal messages than through words. (Bratanič M., 2002:116). In cases where people communicate emotions, they particularly utilise non-verbal signs of communication.

Non-verbal communication has the following functions:

1. The expression of emotions;
2. The expression of mutual attitudes;
3. The display of our qualities
4. The transmission, support and complement of verbal communication;
5. Replacing verbal communication;
6. Conventional expression. (Bratanič M., 1993: 90-92).

It is estimated that the primary source of non-verbal communication is emotions, which vary in intensity during interpersonal interactions. For example, smiling or laughing plays an important role in the communication process. A message conveyed with a sincere, broad smile carries one meaning, whereas the same message delivered with an ironic smile or a contemptuous smirk, with a hand over the mouth, etc., carries a different meaning. Therefore, this emotive expression in non-verbal communication makes the message conveyed more credible. The key to the non-verbal message opens the hidden doors of the interlocutor. It often happens that during the communication process people think one thing, but say another. (Džinič F., 1978:71)

Usually the majority of communication takes place without words. A person's facial expression, the way they move, the tone of their voice – all of this constitutes communication, the importance of which depends on a particular culture, for example. : in some cultures a nod

of the head up and down means ‘yes’, whereas in other cultures this movement means ‘no’. (Richman H., 1994:15)

Even when he stops speaking, the individual continues to communicate with his bodily idiom, that is, he does not cease communicating by stopping speaking, which shows that non-verbal behaviour is a constant source of potential messages and that the majority of communication takes place non-verbally. Thus, according to some research, 75% and even 80% of communication takes place non-verbally. (Petkovski K. & Jankulovska P., 2006:89). The importance of non-verbal communication also lies in the significant role it plays in pedagogical communication, which has long been recognised but to which insufficient attention has been paid. In the educational system, educators and teachers must necessarily master non-verbal communication properly. The teacher's non-verbal communication is not only the transmission of information, but also an expression of empathy, understanding, pedagogical authority, emotional support and the creation of interpersonal relationships.

Earlier we emphasised that non-verbal communication is most often unintentional and beyond conscious control, but that does not mean that the teacher cannot control and deliberately use non-verbal cues during his communication with students. Some significant international research highlights the important role of non-verbal communication in educational activities. In the teacher–student communication process, both forms of communication are important. (Bratanič M., 1993:75,93). Perhaps we are not aware of the great importance that the appropriateness of the non-verbal component of communication has in our everyday interactions, but also in school. Non-verbal communication in the student-teacher interaction helps to create trust, respect, emotional security and a sense of belonging in the classroom, where the teacher, through facial expressions, eye contact, smiles and gestures, can create emotional closeness with students. I can observe the student's emotional state and respond in a humane way, offering support and encouragement. The teacher can understand that the same facial expression or gesture may carry different meanings depending on personality, situation and cultural context.

An encouraging look, a smile, a gesture of approval or a positive movement can influence a student's confidence and motivation. The teacher can immediately change their mode of communication depending on the students' reactions. Many authors, such as Rogers (1985), Greene (1991) and others, emphasise the need for congruence between the verbal and non-verbal elements of communication so that interpersonal communication is as coherent as possible. In order to communicate successfully with others, this means having the same control over non-verbal messages as we do over the verbal messages we send. (Bratanič, M., 2002: 98-116).

According to Stevan Aleksoski, communication can be:

- ➢ intrapersonal (communication of a person with themselves);
- ➢ interpersonal (involving communication between two or more people);
- ➢ communication on the human–computer interface.

We believe it is necessary to clarify in particular non-verbal communication in the student–computer interaction through artificial intelligence.

2. Non-verbal communication in the student–computer interaction through artificial intelligence

Technology and artificial intelligence should be used in a pedagogically sound and ethical manner, preserving human communication, critical thinking and student autonomy. The question arises whether the computer replaces humans in some of their activities and, by doing so, could it also replace humans in the workplace, leaving them without work and means of subsistence? Today's computers replace humans in carrying out some simple, yet complex,

operations in the production process, they replace the psychiatrist or the judge when making decisions in healthcare and, respectively, in the freedom of other people. (Aleksoski, 2000: 26) However, it is impossible for a machine to completely replace the human being, because during contact with another human being, a warmth and closeness is created which no electronics can replace. (Veteroska, S., 1994: 41).

Regarding the question of whether a computer can replace the educator in the educational process, H. L. Dreyfus offered a partial answer in his book 'What the Computers Can't Do: An Critique of Artificial Intelligence.' He says: 'Initially, during the process of communication, humans provide information on all areas of life, whereas the computer is a dead machine that cannot acquire knowledge on its own, but must be supplied with information by humans.' The computer is a machine that cannot perceive, feel or think like a human; it can never form emotional connections with other people. The computer can think logically and make logical decisions. The information that the computer provides to a person cannot possibly replace the words of a human, which inherently contain emotions of fear, joy and hope. Therefore, the computer cannot replace the educator in the educational process. (Aleksoski, 2000: 28)

Today, the teaching process is understood as an informational and communicative process, through the interaction of which the pupil receives various information, messages, knowledge of new life and work activities, which is interpreted as a complex system that in itself contains educational techniques and technology as well as computer technology. (Levajkovska, 2006: 68)

Computer-assisted learning is now an objective reality that demonstrates a high level of acquisition of new knowledge by students across all core subjects. With the help of computers, pupils are motivated to work; they are comprehensively and widely engaged and activated to master new educational content, which is evidence of their psychological and physical strain, as well as their current presence, to successfully achieve the set goals and tasks. (Pavlovski, K., Pavlov, 2004: 13)

The computer, as a sophisticated modern tool, has the potential to facilitate the learning process. During computer-assisted learning, the student is automatically informed of their learning results in programmed sequences that encourage continuous learning. By using the computer in the teaching process, the student learns more intensively in a shorter time, masters the subject matter and acquires new knowledge more effectively. S. Aleksovski, S., 1998: 163-165)

Under current and future conditions, children, pupils and young people are guided to become active, professional citizens in their work and lives, and are simultaneously instructed to make intensive use of information technology, electrical engineering, and critical mathematical and practical thinking in their work and daily lives. Today, artificial intelligence can take part in realising non-verbal interaction in the classroom, recognise certain signs of students' communication and respond to them, but it cannot replace the teacher in fully realising non-verbal communication and in establishing the pedagogical relationship with students. This is because non-verbal communication is not just composed of facial expressions, gestures, body posture and eye contact. Can AI replace the teacher in non-verbal communication? Not entirely. AI can simulate some forms of non-verbal communication, but it cannot fully experience and understand the emotional and pedagogical context of a situation.

For example:

It can display facial expressions and gestures through digital avatars.

It can use voice, tone and animations to capture attention.

It can identify some signs of fatigue, confusion or lack of focus.

It can respond to students' answers and behaviours by adapting the learning content.

Artificial intelligence does not have human non-verbal communication, but it can use visual elements, avatars, simulated expressions, digital gestures and audiovisual cues. AI has

considerable potential to motivate students, especially when used interactively; however, the motivation generated by technology is not necessarily the same as that which stems from the emotional relationship, trust and support of the teacher.
It should be borne in mind that AI cannot guarantee an accurate interpretation of non-verbal expressions. A gesture or facial expression can have different meanings depending on the individual and the cultural context.
If non-verbal interaction is carried out primarily through artificial intelligence, effective pedagogical communication in the classroom requires more than the transmission and interpretation of signals. Therefore, the most appropriate model would be: the teacher, artificial intelligence and the student's active engagement.
In this model, the teacher carries out emotional, pedagogical and social communication, where AI provides technological, visual and analytical support, while the student is an active participant in the communication and learning process.

3. Analysis and interpretation of the results

3.1. Can artificial intelligence replace the teacher's pedagogical and emotional functions of non-verbal communication?

Herein lies the difference between the technological imitation of communication and authentic human communication. Artificial Intelligence can enhance the effectiveness of non-verbal communication in the classroom, but primarily in the role of a supporting tool. It achieves this by using visual elements, animations and signals to capture attention, then encourages participation through interactive activities and immediate feedback, helps to highlight signs of confusion, fatigue or learning difficulties, uses positive reinforcement and personalised activities, and creates opportunities for communication between the student and intelligent systems. However, it cannot replace the teacher's spontaneous smile, encouraging gaze, supportive gesture, emotional closeness and the ability to understand a student beyond what is overtly apparent.
We tested our hypothesis that ***Artificial Intelligence cannot replace non-verbal communication*** by studying students' attitudes and calculating the **χ^2 test value.**

Table 1. Artificial intelligence cannot replace the role of the teacher's non-verbal communication in the teaching process.

Artificial intelligence cannot replace the role of the teacher's non-verbal communication in the teaching process.	Gender, Year, Programme of study																	
	Faculty of Pedagogy								Faculty of Mathematical and Natural Sciences - Informatics									
	Classroom Teaching, Professional Pedagogy, Preschool Education																	
	Year II				Year IV				Year II				Year IV				Total	
	F		M		F		M		F		M		F		M			
	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
Yes, absolutely.	2	2.9	0	0	1	4	0	0	0	0	0	0	0	0	2	22.22	5	3.88
Yes, partly	7	10.14	0	0	0	0	0		1	14.3	4	28.57	0	0	2	22.22	14	10.85

No, but I can complete and support it.	30	43.48	0	0	11	44	0	0	3	42.9	6	42.86	4	80	3	33.33	57	44.19
No, the teacher's non-verbal communication remains irreplaceable.	27	39.13	0	0	12	48	0	0	3	42.9	4	28.57	1	20	2	22.22	49	37.98
I have no opinion.	3	4.35	0	0	1	4	0	0	0	0	0	0	0	0	0	0	4	3.1
Total	67	100	0	0	27	100	0	0	7	100	14	100	7	100	9	100	131	100

From the results presented in the table, it is evident that the majority of respondents have expressed a positive attitude towards the use of artificial intelligence in the educational process. However, when comparing responses by gender, some differences in the distribution of attitudes are observed. In the table the total number of responses is 129, while the total number of respondents is recorded as 131, because two students did not answer this question.

Category of responses	**Frequency**	**%**
Yes, absolutely.	5	3.88%
Yes, partly	14	10.85%
No, but I can complete and support it.	57	44.19%
No, non-verbal communication remains irreplaceable.	49	37.98%
I have no opinion.	4	3.10%
Total responses	**129**	**100%**
No answer	2	—
Total participants	**131**	—

Of a total of 129 identifiable responses, the majority of participants, namely 57 (44.19%), chose the option that artificial intelligence cannot replace the teacher's non-verbal communication, but can complement and support it. Furthermore, 49 participants (37.98%) consider the teacher's non-verbal communication to be irreplaceable. These two options together account for 82.17% of the responses, which indicates a clear orientation towards preserving the role of non-verbal communication in the educational process. On the other hand, only 5 participants (3.88%) believe that artificial intelligence can fully replace this communication, while 14 participants (10.85%) consider that such a replacement is only partially possible. A small percentage, 3.10%, did not express a stance on this issue.

Overall, the results show that participants view artificial intelligence more as a supplementary and supportive tool for the educational process than as a replacement for the teacher's non-verbal communication. This can be explained by the importance of non-verbal communication in expressing emotions, creating closeness, building trust and establishing pedagogical relationships between the teacher and students.

Based on the responses received, the results are consistent with this hypothesis. The survey results support our hypothesis, as the overwhelming majority of students believe that the teacher's non-verbal communication cannot be replaced by artificial intelligence. The χ^2 value = 99.18 and $p < 0.001$, df = 4 (degrees of freedom) was calculated assuming an equal distribution of the five categories. It does not directly test our hypothesis. For a more direct test of the hypothesis, we could also compare the 106 responses with the 19 responses, excluding the 4 unconsidered responses. This test would require, as a reference point, the assumption that both positions hold 50%. The data show that the overwhelming majority of students (82.17%) believe that artificial intelligence cannot replace the role of the teacher's non-verbal communication, but can complement and support it. This demonstrates the importance of non-verbal communication in the teaching process.

From the results obtained, it appears that the hypothesis was statistically verified; in other words, it was supported by the empirical findings of the research.

3.2. Forms of interaction in non-verbal communication that affect students' academic achievement

Non-verbal communication between the student and the teacher has a human, emotional and social dimension that artificial intelligence can support, but not replace. On the other hand, Artificial Intelligence offers opportunities to expand forms of interaction, individualise communication and increase motivation through digital tools. The most pedagogically appropriate model would be the integration of both forms of interaction, where the teacher remains the central figure in pedagogical communication, while Artificial Intelligence serves as a supplementary tool to enhance it. Human non-verbal communication and interaction with artificial intelligence are not entirely the same phenomena. In **Table 2** below, we present the results obtained from the questionnaire with the students. The processing of the results was carried out separately for students of the Faculty of Pedagogy and the Faculty of Mathematical and Natural Sciences – Informatics, as well as by year of study. This enabled us to compare the opinions of students with different professional backgrounds.

We have highlighted three parameters as forms of non-verbal interaction that influence students' academic achievements:

1. Direct interaction with the lecturer;
2. Interaction with Artificial Intelligence and
3. A combination of interaction with the lecturer and Artificial Intelligence.

Table 2. Forms of interaction in non-verbal communication that influence students' academic achievement.

Forms of interaction in non-verbal communication that have the	Faculty of Pedagogy - Classroom Teaching, Professional Pedagogy, Preschool Education		Faculty of Mathematical and Natural Sciences - Informatics	
	Year II	Year IV	Year II	Year IV

greatest impact on your academic achievements.	F		M		F		M		F		M		F		M		Gjithësej	
	f	%	f	%	f	%	F	%	f	%	f	%	f	%	f	%	f	%
Direct interaction with the teacher.	41	61.19	0	0	15	55.56	0	0	2	28.57	2	14.29	1	14.29	3	33.33	64	48.85
Interaction with Artificial Intelligence.	1	1.49	0	0	1	3.7	0	0	0	0	5	35.71	2	28.57	1	11.11	10	7.63
The combination of interaction with the teacher and artificial intelligence	25	37.31	0	0	11	40.74	0	0	5	71.43	7	50	4	57.14	5	55.56	57	43.51
Total	67	100	0		27	100	0		7	100	14	100	7	100	9	100	131	100

From the analysis of the data in the table, we observe that 64 (48.85 %) of all students believe that direct interaction with the teacher has the greatest impact on their academic achievements, 57 (43.51 %) prefer a combination of the instructor with Artificial Intelligence (AI); only 10 (7.63 %) rely solely on interaction with AI as the primary factor. The results clearly show that the combination of traditional interaction and a hybrid interaction model predominates.

Distinguishing features by faculty, year, and gender

Category	**Direct communication**	**Interaction with AI**	**Combination (Hybrid)**	**Total**
Faculty of Pedagogy - Classroom Teaching, Professional Pedagogy, Preschool Education	56 (59.57%)	2 (2.13%)	36 (38.30%)	**94**
Faculty of Mathematical and Natural	8 (21.62%)	8 (21.62%)	21 (56.76%)	**37**

Sciences - Informatics				
Female (Total)	59 (54.63%)	4 (3.70%)	45 (41.67%)	**108**
Male (Total)	5 (21.74%)	6 (26.09%)	12 (52.17%)	**23**
Year II (Total)	45 (51.14%)	6 (6.82%)	37 (42.05%)	**88**
Year IV (Total)	19 (44.19%)	4 (9.30%)	20 (46.51%)	**43**

The Faculty of Education has 94 students, of whom the majority, 56 (59.57%), choose direct interaction with the teacher, while 36 (38.30%) choose the hybrid approach (a combination of direct interaction and interaction with AI); in this report, interaction with AI is almost negligible (2.13%).

In the Faculty of Mathematical and Natural Sciences, in the Informatics department, with 37 students surveyed, The majority of students, 21 (56.76%), prefer the hybrid approach (combination), while interaction with the instructor alone and interaction with the AI alone share the same percentage (21.62% each), with 8 students. Of the 108 female students, 59 (54.63%) clearly value the professor's direct role, 45 (41.67%) the hybrid model and 4 (3.70%) interaction with AI alone. Male students, 23 in total, prefer the hybrid model more (12, 52.17%), and have a much higher acceptance of AI as a standalone tool (6, 26.09%), compared with only 5 (21.74%) who opt for traditional communication.

Students of the Faculty of Education (who are preparing for educational and social-based professions) prioritise human interaction, empathy and direct guidance from the teacher.

On the contrary, Computer Science students (Faculty of Mathematical and Natural Sciences) are more exposed to and comfortable with technology, which is reflected in their greater openness to using AI (either on its own or in combination). The high proportion of students opting for a combination of instructor-led teaching and AI (43.51%) indicates a natural transition towards hybrid education, where students seek synergy between pedagogical experience and technological efficiency.

The impact of the interaction format varies significantly by field of study. Students at the Faculty of Education give an absolute preference to traditional communication with the instructor (59.57%), owing to the interpersonal nature of their profession. Computer Science students (Faculty of Mathematical and Natural Sciences) predominantly favour the hybrid model (56.76%) and show a much higher openness to the use of AI. Overall, 92.36% of students (48.85% traditional + 43.51% hybrid) see the professor as an essential element for academic achievement.

This indicates that ***students do not view Artificial Intelligence technology as a replacement for the teacher, but as an assistant tool that enhances efficiency when combined with pedagogical guidance.***

The data show that human interaction is decisive for academic achievement. With 92.36% support (a combination of direct communication at 48.85% and hybrid at 43.51%), students confirm that guidance, explanation and mentoring from a professor cannot be replaced.

AI is seen as a helper, not a replacement. Only 7.63% of students believe that the form of interaction with AI has the greatest impact on their achievements. This confirms that technology is perceived as a supporting tool to facilitate the learning process, but not as the sole source of knowledge or assessment.

AI as a complement rather than a replacement, the teacher remains central.

4. Conclusion and recommendation

Does artificial intelligence increase the effectiveness of non-verbal communication in the classroom, or does it merely make the learning interaction more engaging and motivating?
These are not the same thing. A student may be motivated by animations and avatars, but that does not necessarily mean they have developed better non-verbal communication, empathy or higher-quality interpersonal relationships.
Ultimately, AI can make classroom communication more interactive, varied and potentially more effective, but it should not aim to replace human non-verbal communication. It should help the teacher to communicate better, not communicate in their place.
Direct communication, classroom debate and individual mentoring should be preserved and encouraged, with AI used primarily as a secondary support tool.
To strengthen the integration of AI into project work, by directing communication with the teacher towards solving complex problems and strategic guidance.
As the hybrid model becomes dominant, institutions must develop clear guidelines on academic integrity. Students must be made aware that AI functions as an "assistant" to their achievements, while the final assessment, critical reasoning, and mastery of knowledge depend on their personal engagement and the teacher's guidance.

References

[1] Lutfiu Kadriu Lulzime. (2016). Komunikimi midis mësimdhënësit dhe nxënësit në shkollë, Luma Grafik Tetovë
[2] Prevalla, Shaban. (2014). Komunikimi interpersonal, Shkup
[3] Murati, Xheladin. (2004). Komunikologjia dhe teknikat e komunikim, Çabej,Tetovë
[4] Judith N. Martin, Thomas K. Nakayama (2008) Experiencing interkultural comunicatiopn an introduksion, MC GRAW HILL
[5] Gordon R. Wainwright, Body Language, (2010), Говорот на телото ,СИЛСОНС
[6] Pavao Brajsha (1993) Pedagoska komunikacija (razgovori, problemi i konflikti u školi), Zagreb
[7] Brataniq Marija. (2002)Paradoks odgoja, Zagreb
[8] Ќупева, Тамара. (2014). Педагошка Комуникација, Skup
[9] Michael J. Papa. Tom D., Daniels, Barry K. Spiker (2008), Organizational Communication Perspektives and trends SAGA Publications, Los Angeles, USA
[10] Pavllovski Gj. ; K. Pavllov, (2004), Nastavnikot na XXI – vek , Shkup :Prosvetno delo –Spisanie ya pedagoshki prashanja, g. LVII nr. 5
[11] Aleksovski, S. (1998), Psihologija na komunikacijata, Pedagoshki fakultetet "Goce Dellçev" Shtip
[12] Gogoska, Ll. (2002), Kvalitativna sovremena i futurulloshka komponenta na nastavniçkata profesija (maq.), Shkup, Vospitni krstopati – spisanie g. VII, nr. 61 S.
[13] Aleksoski, (2000), Vidovi komuinikacija pomegju ëovekot i kompjuterot, Shkup: Prosvetno delo, LIII, nr. – 4
[14] Veteroska , S. (1994), Inovacii vo nastavata so primena na kompjuter vo izuçuvanjeto na stranski jazici (maq.), Shkup: Prosvetno delo, spisanie ya pedagoshki prashanja, XLVIII-nr 2,
[15] Levajkovska, S. (2006), Obrayovna teknologija vo nastavniot process (maq.), Shkup: Prosvetno delo – spisanie ya pedagoshki prashanja, g. LIX. F
[16] Dekiq, S. (1997), Koristenje na smetaëite vo nastavata (maq.), Shkup: Prosvetno delo –spisanie za pedagoshki prashanja
[17] Petkovski K. dhe P. Jankullovska, (2006), Dellovno komuniciranje (maq.), Manastir S.
[18] Aleksovski &V. Cvetanoviq, (2002), Kulltura na opshtenje vo pedagogija i vo dellovnoto komuniciranje (maq.) Shtip, Pedagoshki Fakultet
[19] Чокревски Т., (2000). Социологија на комуникации, Студентски збор . Скопје: НИП
[20] Тоновски Ѓ., (1999) Светот на комуникацијата , Скопје
[21] Džinič F., (1978) Nauka o komuniciranju, Beograd, Savremena administracija.