






# Development of the digital communication culture of prospective teachers based on digital etiquette training in the context of Kazakhstan

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## Abstract

This study examines the impact of digital etiquette training on the development of a digital communication culture among future teachers by providing new perspectives and access to scientific knowledge in the field of digital etiquette. A mixed-methods approach was used both before and after the test. The study included 115 respondents. The preliminary testing between the groups showed that both groups were at the same level in terms of communicative culture indicators. Additionally, participants had no prior knowledge of digital etiquette. An authors' programme was created specifically for the course and implemented to help students become more skilled with technology. A set of measures was carried out to develop a digital communicative culture through the means of netiquette and the introduction of technology for individualization and personalization of learning. This study found the impact of digital etiquette on the development of a digital communication culture in future teachers by providing new perspectives and access to scientific knowledge in the field of digital etiquette as well as the practical application of this knowledge to support cultural digital interaction.

**Keywords:** Development, Digital communication culture, Digital etiquette, Prospective teachers, Training.

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### Contribution of this paper to the literature

This study adds to the existing literature by examining the impact of digital etiquette training on the development of a digital communication culture among future teachers and providing new perspectives and access to scientific knowledge in the field of digital etiquette.

## 1. Introduction

The development of digital ethics is continuing not only in Kazakhstan but globally as well. Every author, community and organization creates its own rules either in the form of a charter or a basic set of guidelines. There are currently no universal standards governing digital etiquette. This issue is especially important for educational organizations (Oral, 2023). Researchers believe that digital etiquette is based on new and emerging information and communication technologies. It reflects both the specifics of etiquette communication and the nature of these technologies (Heitmayer & Schimmelpfennig, 2023; Ponte, Balaquinto, Gaerlan, & Tacadena, 2023). The specifics of strategies for teaching include methodological components. Teaching etiquette offline is both facultative and optional. Teaching the basics of digital etiquette focuses on the technological component which contributes to the disdain for others in digital collaboration. The researchers emphasize that young people's excessive Internet use can make it difficult for them to develop normal face-to-face communication skills (Al-Khatib, 2023; Jaisy, Wahyuningsih, & Rizki, 2022). Their ability to engage in deep and meaningful communication diminishes. In this regard, researchers' critical approach to assessing Internet communications as a tool for reducing genuine interpersonal communication has spread as a natural intellectual reaction to a new leap in the development of communication technologies. The more time a user spends online, the less time they devote to authentic relationships. In this regard, the future development of digital etiquette entails acquiring or improving the skills and knowledge that are needed in the digital communication culture (Mangkhang & Kaewpanya, 2021; Ng, Leung, Su, Ng, & Chu, 2023). Thus, digital etiquette is a communicative phenomenon that reflects the properties and specifics of etiquette communication in virtual space while also exposing the risks of "communication failures" in digital reality (Soler-Costa, Lafarga-Ostáriz, Mauri-Medrano, & Moreno-Guerrero, 2021). These risks are accompanied by specific ethical issues that necessitate the development of digital etiquette in education as well as the incorporation of digital etiquette courses into the educational process to foster a culture of digital interaction. In this regard, the role of digital etiquette in higher education is being debated as the digital interaction system evolves as are ideas about ethical and unethical behavior in specific situations which necessitates the establishment of norms and regulations governing online activities (Makonye, 2020; Saputra & Al Siddiq, 2020).

This is an important problem for Kazakhstan as well because new technologies are being actively employed in universities to not only create a digital educational space and change traditional teaching methods but also to form a digital communicative culture of which digital etiquette is an important component (Akhmetova et al., 2022; Nagima et al., 2023). However, students in the country's universities do not currently have a separate subject for "Digital Etiquette" or "Digital Education." This specialized knowledge is incorporated into other areas of higher education. There are objective explanations for this: Digital etiquette is new in the digital age and as a full-fledged subject of knowledge. It is still being formed and developed which is the focus of research (Costa, Batista, Almeida, & Menezes, 2020; Zheng et al., 2024). As a result, curricula and foundational professional education programmes at universities provide insufficient attention to the challenges of cultivating a future teacher's digital communication culture. In this regard, there is a high risk that the majority of pedagogy graduates will maintain a low level of communicative culture, significantly reducing the effectiveness of their professional activities and complicating professional growth for future specialists. However, teaching students the basic concepts of digital etiquette (and these are just a few of them) which is now done indirectly through other subject knowledge is becoming an important component of higher education alongside digital literacy (Zhakupova, Kyakbaeva, Karimova, & Omarova, 2022). Thus, in our country, etiquette topics in digital interaction are in a state of comprehension. Although digital rules of behavior are not currently enshrined in legislation, there are widely accepted rules of behavior as well as unacceptable behaviors condemned by network users. In this regard, the most important aspect of digital interaction is digital etiquette and its influence on the development of students' communication cultures. However, the main question is whether digital etiquette contributes to the development of a communication culture. If so, how does this happen? Unfortunately, the existing literature has not sufficiently studied the issue of developing a communication culture among students based on digital etiquette despite the importance of the problem of creating a culture of digital interaction. In this research, we are focusing on investigating the efficacy of organizing the process of teaching students digital etiquette skills in terms of learning outcomes, fostering digital communicative culture and the practical application of this knowledge to support cultural digital interaction.

### 1.1. Questions for Research

- Q1: What is the level of formation of the digital communication culture of students before and after training?
- Q2: What is the level of communicative knowledge and skills gained as a result of attending the training course?
- Q3: What impact does a digital etiquette course have on students' digital culture development and mastery?

### 1.2. Objectives

This study aimed to examine the impact of digital etiquette training on the development of a digital communication culture among future teachers by providing new perspectives and access to scientific knowledge in the field of digital etiquette.

The hypothesis is that digital etiquette training will significantly improve prospective teachers' digital communication cultures while facilitating mastery of a culture of digital interaction.

### 1.3. Significance of the Study

This study is significant because it addresses the current issue of fostering a digital communicative culture among prospective teachers. Specific ethical issues arising from digital interaction necessitate the development of new forms of communication regulation, including language, style and formats as well as moral standards and

virtual relationship etiquette (Flew, Martin, & Suzor, 2019; Rochefort, 2020). The study and accurate description of such fundamental principles of digital etiquette is a research task that necessitates an answer. However, digital etiquette is still in its early stages of development and is only becoming known as a new type of etiquette communication in the digital environment (Gezmen, 2022). This study adds to the existing literature by investigating how digital etiquette influences the development of pre-service teachers' digital communication culture, providing new perspectives and access to scientific knowledge in the field of digital etiquette as well as the practical application of this knowledge to support cultural digital interaction. This study includes information about digital etiquette by providing new perspectives and access to scientific knowledge in the field of digital etiquette. The practical application of this knowledge is critical to supporting cultural digital interaction as well as the properties and specifics of etiquette communication which will serve as the foundation for future educational programs on digital etiquette in higher education. This study is significant because it can provide useful information about the potential benefits of instilling a digital communication culture in pre-service teachers. It can be implemented in pedagogical educational institutions providing an opportunity for future specialists to interact digitally while adhering to digital etiquette rules.

## 2. Literature Review

### 2.1. Digital Etiquette: Educational Strategies in Universities

Digital etiquette is a relatively new area of computer science that combines ethics, psychology and information technology (Edirippulige et al., 2022). One aspect of information culture is adhering to Internet etiquette rules. In our opinion, research does not adequately prepare future teachers for network interaction and most existing teachers need to improve this skill (Falloon, 2020; Koponen, Asikainen, Viholainen, & Hirvonen, 2019). The introduction of digital learning has significantly increased the importance of developing digital etiquette skills for employees of educational institutions (Morgan, Sibson, & Jackson, 2022; Öncül, 2021). However, the emphasis on these values has resulted in a diminished and sometimes complete disregard for the importance of communicative culture in modern society. This mostly affected Generation Z, the younger generation whose members were raised in the digital era and are significantly different from each other (Sakdiyakorn, Golubovskaya, & Solnet, 2021). A special focus on oneself, manifested in individualism, the cult of publicity and self-promotion, and opposing one's opinion has largely determined freedom as the new generation's primary behavioral value in both real and virtual spaces.

Digital etiquette is not yet a part of universities' educational strategies (Blaj-Ward & Winter, 2019; Martzoukou, Fulton, Kostagiolas, & Lavranos, 2020). On the one hand, it is assumed that first-year students already have digital literacy. They are familiar with the fundamental rules of digital etiquette. However, this disciplinary knowledge is in its early stages. It was discovered that few students are familiar with the rules for preparing homework and presentation materials in digital format as well as the rules of behavioral culture on the Internet, particularly at video conferencing events, the rules of electronic business correspondence and other digital etiquette during the pandemic. Although there have been some developments in this area. For example, the topic of digital etiquette is included in the subject fields of disciplines such as "business communication", "business etiquette", "digital culture", and so on. However, these programs did not resolve the issue. During the pandemic, everyone had to quickly learn the rules of digital etiquette because it was the norm in almost all spheres of social life regardless of the type of activity (education, medicine, business, etc.) and it provided a great opportunity to build effective communication. In general, practice has shown that in the university environment, digital etiquette as a behavioral culture in the spaces of the digital and physical environments is more than relevant and this is determined not only by the quarantine period (Komninou, Kakderi, Mora, Panori, & Sefertzi, 2022). Mastering the culture of networking has become the norm in this new reality. Partially incorporating digital etiquette into other communication disciplines does not solve the problem. For example, when applying for a graduate job such knowledge is critical and this includes proper resume formatting, video interview recording, interview behavior, and direct communication with the employer. In this regard, the importance of a personal brand is being updated, the formation of which requires active conscious activity in creating one's reputation, an important component of which is etiquette behavior in digital and non-digital environments (Qiao, Yeung, Zainuddin, Ng, & Chu, 2023; Taylor-Wesselink & Teulon, 2022). Knowledge of Internet etiquette norms is not only a tool for communication but also an opportunity to make breakthroughs in the problem of "moral machines" which is becoming a common concern of physicists and lyricists and is regarded by analysts as a trend towards the increasing importance of the process of humanitarian modern knowledge in response to new realities (Akçil & Bastas, 2020; Ribble, 2021). This means that engineering professions, including new professions aimed directly at teaching machines communication, interaction with humans, digital ethics and etiquette must develop special humanitarian-oriented educational programs. He teaches artificial intelligence and demonstrates that the most sophisticated intelligent systems of today are made by people and only depend on human knowledge, moral principles and cultural norms. Thus, the practice of teaching digital etiquette in higher education is in its infancy (Pratiwi, Hasanah, Purnama, Ulfah, & Saripudin, 2022). Some knowledge is represented in other communication disciplines but the importance of the topic requires other decisions. The formulation and cultivation of new rules into the rules of digital etiquette as a behavioral culture in digital and physical spaces is a global trend that reflects the challenges of the time and actualizes the importance of digital etiquette as subject knowledge in higher education.

### 2.2. Digital Communication Culture

Digital communication culture is a set of norms, methods and modes of interaction that reflect the best behavioral patterns and values. Researchers view an individual's digital communicative culture as a complex, multifaceted formation (Çötel, 2019; Li, 2022; Valtysson, 2020).

Researchers believe that an individual's communicative culture reflects: (a) the individual's culture; (b) a culture of intellectual activity that manifests itself in the logical construction of statements as well as mastery of methods for solving communicative problems; (c) speech culture as a means of forming and formulating thoughts and (d) a culture of digital interaction between a person and others (Hong, 2022; Liu, 2022; Ocón, 2021; Zhou, Sun, & Huang, 2019).

The phenomenon of communicative culture must be viewed in tandem with the concepts of "culture" and "communication" (Baker, 2022; Szkudlarek, Osland, Nardon, & Zander, 2020). In philosophical discourse, culture is



examined through activity, axiology and personality. Representatives of the activity approach believe that culture has the potential to shape a socially active personality focused on transforming our surroundings. Individuals create socially significant patterns, values and symbols. In its broadest sense, the concept of "culture" refers to humanity's ability to create a new reality that transcends its biological nature. According to [Davis \(2020\)](#) culture is "an integral unity of the methods and products of human activity in which his activity is realized and serves his self-improvement, satisfaction and elevation of needs and harmonization of human-society relations." Researchers from a philosophical perspective believe that culture and communication are in complex interaction ([Kruse, Rakha, & Calderone, 2018](#); [Puckett, 2020](#)). Communication is an important condition for the production of values, samples and the way of existence of culture.

Communication is a complex phenomenon in which technological, mental and informational aspects are distinguished ([Guzman & Lewis, 2020](#); [Van Ruler, 2018](#)). Some researchers believe that communication acts as an integral element of communication ([Musheke & Phiri, 2021](#)). The culture of communication is a complex of moral and value guidelines for an individual. They allow a person to regulate relationships with society. [Bentahila, Fontaine, and Pennequin \(2021\)](#) define the components of a culture of communication as personal culture based on intellectual, communicative and emotional and moral cultures manifested in moral principles, ideals and norms. Thus, digital communicative culture is a complex and multidimensional concept and therefore requires diverse analysis. It is interdisciplinary and is studied in philosophy, linguistics, communication theory, social psychology and pedagogy.

Numerous interpretations of this concept in language theory. Some researchers define communicative culture as the level of development, application and use of norms, values, knowledge and skills in everyday communication whereas others associate communicative culture with language skills. Communicative culture is the collection of cultural norms, knowledge and values used in the process of communication. Most sources associate the concept with speech culture which is an important component of an individual's overall culture ([Gutiérrez-Santiuste & Ritacco-Real, 2023](#)).

In pedagogy, the content of the concept of "communicative culture" is understood differently. It is defined as skills that ensure effective interaction between individuals allow them to solve communication problems and are the result of personality development as part of the professional culture of the future specialist. Some researchers consider communicative culture as part of the professional culture of a specialist, a synthesis of knowledge, skills, norms and behavioral stereotypes used in society ([Akdere, Acheson, & Jiang, 2021](#)). The primary function of communicative culture is integrative. It is manifested in communicative culture's ability to connect people and ensure effective communication. Integration is also seen in the strengthening of pre-existing ties and forms of association. The integrative function is based on a person's desire to communicate with others and express himself. Individuals frequently bridge social and cultural divides by defending their interests and needs. Communication's lack of integration has the potential to seriously destabilize the situation. Traditional modes of communication are increasingly being replaced by more effective forms of interaction. These interactions alter values and cultural attitudes forming new aspects of identity ([Chen & Gabrenya Jr, 2021](#)).

Thus, the digital communicative culture of an individual is a complex synthesis of communicative knowledge and communication skills. Moreover, it is a dynamic and evolving system.

We come to the following conclusions when trying to generalize the above approaches and numerous communication theories:

- (1) There is no single definition of digital communication culture today.
- (2) Digital communicative culture is a derivative of the concepts of "culture" and "communication" which are expressed in the unity of their signs and characteristics.
- (3) Digital communication culture is an element of the concepts of "culture of communication" and "professional culture."

Many researchers have noted that the most important tasks that higher professional education assigns to itself are the development of a communicative culture, education and professionalism ([Simonsson & Heide, 2021](#); [Tansey & Parks, 2022](#)). Communicative culture is a reflection of a person's overall culture but it can also be viewed as a component of his professional culture. The formation of a communicative culture among students involves both self-education and the creation of an appropriate teaching environment ([Iseminger, Acheson-Clair, Kelly, & Morris, 2020](#)). Thus, the development of ideas about personal communicative culture as a system that improves active interaction with other communicative systems is necessary to form in students a conscious creative position and a desire to expand the content and forms of communicative activities to overcome isolation and to participate in business and public communications.

### 3. Method

#### 3.1. Research Design

A mixed-methods approach was used before and after the test to collect and analyze data. Experimental design is a type of comparative research in which the interaction of two or more variables is investigated under controlled conditions to see if there is a relationship and whether they influence the groups under study. An experiment refers to scientific procedures designed to test hypotheses, discover new processes and phenomena and demonstrate facts. When we talk about controlled experimental conditions, we typically mean laboratory studies.

#### 3.2. Research Sample Formation

The experimental and control groups were selected using randomization also known as random selection. The study was conducted at the Abai Kazakh National Pedagogical University. According to the experiment's purpose, two groups were formed using random sampling: the CG ( $n = 57$ ) and the EG ( $n = 58$ ). The study will include a seven-week digital etiquette training session to help EG participants improve their digital communication culture. The respondents' ages ranged from 20 to 28 years old.

#### 3.3. Measures

General sociometric indicators were collected including gender, age, course of study, level of preparation for the pedagogical education program and direction of study (see [Table 1](#)).

Table 1. Descriptive information provided by respondents.

Descriptive information about respondents		Quantity	Sample
The university's name	Abai Kazakh National Pedagogical University	115	100%
The areas of study	Pedagogical	115	100%
Student training course	2 course	115	100%
EG	Female	51	42%
	Male	7	8%
Total		58	50%
CG	Female	52	45%
	Male	5	5
Total		57	50%

3.4. Experimental Manipulation and Research Procedures

We devised an experiment that allowed us to identify cause-and-effect relationships because our primary objective was to evaluate the efficacy of various experimental environments.

We used a between-groups study design. The determining factor was the impact of learning which we had complete control over. The study's outcome variables which we anticipated would change as a result of the independent variable manipulations included various measures of teaching impact effectiveness.

Experimental manipulation: Participants were divided into two groups at random. An original training program was created to improve the communication skills of EG participants. The control group was examined using the traditional method.

The experimental manipulation concerned only the teaching method. The control group used the same educational software while the experimental group followed the instructor-led course program "Basics of Digital Etiquette." The training was provided at the university by a full-time base teacher in classrooms familiar to the students.

3.5. Experimental Process

Step 1: Algorithm for developing a digital communication culture for students.

(1) A level approach to presenting results is used to assess the achievement of learning outcome requirements (constructing assessment scales and describing results). The process of developing a digital communicative culture is accompanied by the formation of guiding principles of action for students. According to the findings, five levels of the development of digital communication culture were identified and differentiated (see Figure 1).

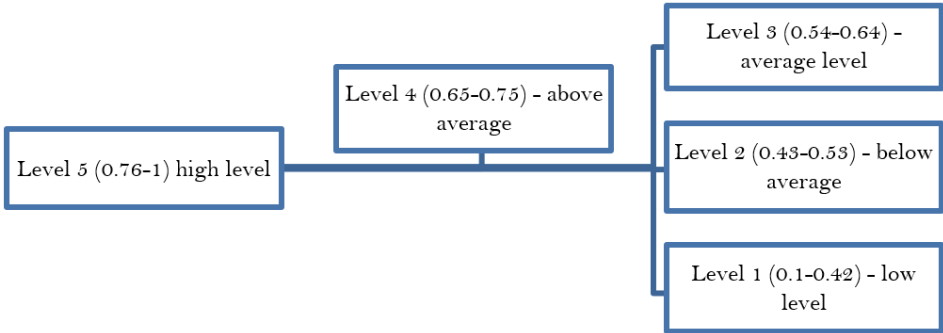


Figure 1. Levels of development of digital communication culture.

(2) The structure of communicative culture as a complex social formation includes the following parts: (1) the cognitive component including knowledge about interpersonal communication and ideas about a tolerant personality. (2) The emotional-evaluative component is expressed in the ability to empathize with and adequately assess people’s behavior and speech and (3) the behavioral component, manifested in interaction between people in establishing cooperation in carrying out joint activities and in conducting dialogue.

The cognitive component consists of knowledge and ideas about communicative culture and the basics of interpersonal communication as well as ideas about culture and the ethics of communication.

The emotional-evaluative component of communicative culture is associated with the moral qualities of the individual and manifests itself in the form of value judgments, beliefs, feelings and moods.

The behavioral component is associated with the actions and deeds of the individual and with interpersonal and cultural interaction. The level of formation of a communication culture is determined on the basis of behavior.

(3) Assessment of the effectiveness of the influence of digital etiquette on the development of digital communicative culture is provided by the developed set of criterion-indicative features of communicative culture (see Figure 2).

Criteria	Indicators
Procedural	Original
Motivational	Definite
Reflexive	Meaningful
Developmental	Efficient
	Creative

Figure 2. Criteria and indicators of digital communication culture.

The indicators of digital communicative culture enable the selection of diagnostic tools that will be used to demonstrate the presence of specific criteria in subjects revealing the current level of communicative culture among participants.

(4) To ensure that EG participants' communication skills improve, a proprietary course program called "Basics of Digital Etiquette" has been created. This course is to get acquainted with the concepts and rules of digital etiquette and develop the skill of applying the rules of digital etiquette in the Internet space to build effective communication. A set of measures was carried out to assess the motivational readiness of students to develop their communicative culture through the means of netiquette and the introduction of technology for individualization and personalization of learning. The content block of the program included a set of educational modules and practical activities in the digital environment. Particular attention in the course is paid to the critical analysis of various models of communicative culture that predetermine aggressive or tolerant communication practices. The most intriguing, promising or indicative communication cultures for contemporary Kazakhstani reality are used to illustrate the topic of communication cultures in addition to their abstract form.

#### Step 2: Pre-testing

Testing was carried out to determine the initial levels of the digital communication culture of the participants. Testing before training helped us distribute participants according to available levels. The joint analysis of the results helped to convey to participants information about their weak points in training which they should pay attention to in the future. Level measurements were carried out twice. Students were given 7 weeks of training in digital etiquette skills between the two measurements.

#### Step 3: Intervention

An experimental group was trained using a digital etiquette course. Student training is scheduled for two hours per week totaling fourteen hours. The session began with an introduction to the course's goals and expectations followed by an introduction to digital engagement-related topics. The training involved three technological stages: formation, consolidation and transformation. The systematic progression through all technological stages ensures that the full potential of digital etiquette is realized and that maximum results are achieved. Next, students were divided into five groups (five groups of ten participants and one group of eight participants) to work on an individual project called "Network Communication Strategy " on the Telegram platform. The teacher constantly monitored their work and provided appropriate feedback.

#### Step 4: Post-test

Evaluation procedures were conducted to determine the nature of the training's impact on the EG participants following the intervention. A specifically designed set of criteria and indicators is used to assess the effectiveness of influence.

### 3.6. Data Collection Tools

A test was conducted to confirm the hypothesis that digital etiquette training will significantly improve prospective teachers' digital communication cultures while facilitating mastery of a digital interaction culture.

#### 3.6.1. A Test to Assess the Level of a Communication Culture

Respondents are asked 20 questions to assess their initial level of communication ability. If the answer to the question is positive, use a "+," and if it is negative, use a "-."

The sum of positive answers to even-numbered questions and negative answers to odd-numbered questions, divided by 20 determines communicative ability level.

The degree of expression of the following communicative skill indicators was determined: 1) Direction 2) Efficiency 3) Dominance 4) Self-confidence 5) Exactingness 6) Stubbornness and Negativity 7) Compliance 8) Psychological tact 9) Responsiveness. There are four levels of expression or zones for these abilities: 0–4 points: low level (nominal zone), 4–8 points: average level (potential zone); 8–12 points: high level (promising zone) and more than 12 points: extremely high level (super zone). The coefficient of knowledge absorption is determined by:

$\eta_i = P_i / N_i$ , where  $i = 1, 2, 3, 4$ , and 5 are levels of knowledge assimilation.

$\eta_i$  is the coefficient of knowledge acquisition level.

$P_i$  is the number of correct answers to questions of a given level of complexity.

$N_i$  is the number of questions of this level of difficulty.

The criterion for the completeness of knowledge assimilation was the average value of the indicators, the average coefficient of knowledge assimilation ( $\eta_{av}$ )<sub>3</sub> which shows in relative units the percentage of correct answers concerning the total number of questions asked.

### 3.7. Data Analysis

A between-group analysis was conducted to measure the differences between the effectiveness of the digital etiquette method and the traditional method. The results were analyzed using SPSS software version 26. Student's t-test was used to evaluate the relationship between pre- and post-test mean scores on the tests in each group.

## 4. Results

The following results were obtained during the preliminary testing stage: the initial level of development of the respondents' communicative culture (see Figure 3).

According to the data, 52.2% of those surveyed had a low degree of communicative culture (0.1–0.45) or below average (0.46–0.55); 36% of respondents have an average level (0.56–0.65) and 11.8% of students have an above average level (0.65–0.75). Not a single respondent has a high level of communicative culture development. According to initial testing, the following issues were identified in respondents: low sociability and communication skills, self-doubt and isolation, a lack of independence in judgment, an inability to communicate professionally and an inability to use digital technologies, particularly netiquette.

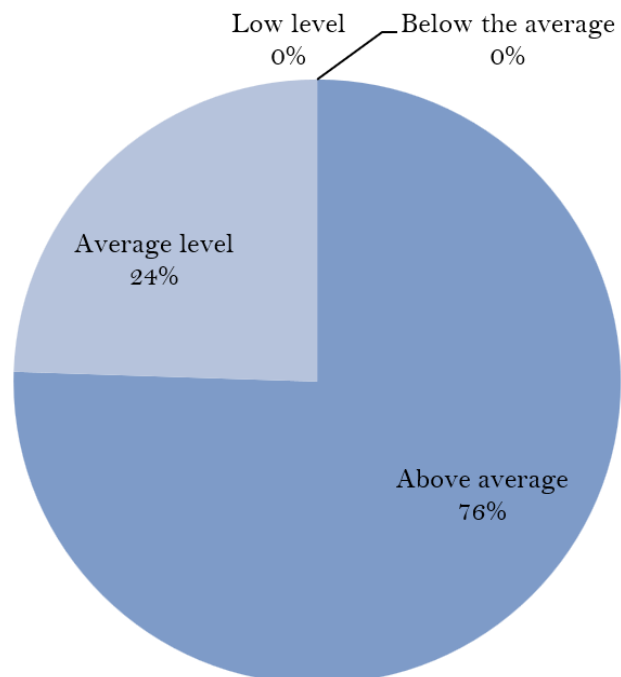


Figure 3. Results of the preliminary tests.

The results compare the coefficients of mastering communicative knowledge and skills following the special course "Basics of Digital Etiquette" (see Table 2).

Table 2. Findings from diagnostic tests assessing the levels of communicative knowledge and skills.

Knowledge (Kn) and skills (SKs)	Participants	1 level	2 level	3 level	4 level	5 level
		n <sub>1</sub>	n <sub>2</sub>	n <sub>3</sub>	n <sub>4</sub>	n <sub>5</sub>
Pre-test (Kn)	All participants	0.71	0.60	0.49	0.33	0.20
Post-testing (Kn)	CG	0.76	0.64	0.50	0.41	0.30
	EG	0.93	0.88	0.81	0.74	0.57
Pre-test (SKs)	All participants	0.83	0.73	0.54	0.40	0.31
Post-testing (SKs)	CG	0.86	0.74	0.63	0.49	0.54
	EG	0.99	0.90	0.86	0.78	0.67

In the EG, the coefficient of knowledge of levels 4 and 5 is 0.74 and 0.57 compared to 0.41 and 0.30 in the CG, and the coefficient of communication skills in the CG of levels 4 and 5 is 0.78 and 0.67 compared to 0, 49 and 0.54 in the CG.

After the intervention, the EG participants had evaluation processes to teach them digital cultural proficiency (see Table 3).

Table 3. Post-test results.

Indicators	Pre-test (%)		Post-test (%)		Dynamics (%)	
	EG	CG	EG	CG	EG	CG
Procedural criterion						
Original	22.3	26.2	10.2	19.2	-12.1	-7.0
Definite	25.10	17.6	10.4	17.6	-14.7	0
Meaningful	25.8	28.0	17.2	29.9	-8.6	1.9
Efficient	22.5	21.2	46.7	24.5	24.2	3.3
Creative	4.3	7.0	15.5	8.8	11.2	3.5
Total	100	100	100	100	35.4	6.8
Motivational criterion						
Original	24.2	21.2	6.7	14.3	-17.5	-6.9
Definite	27.5	22.6	13.9	19.1	-13.6	-3.5
Meaningful	27.7	26.2	17.1	33.5	-10.6	7.1
Efficient	17.1	24.8	48.6	26.2	31.5	1.4
Creative	3.5	5.2	13.7	6.9	10.2	1.7
Total	100	100	100	100	41.7	3.1
Reflexive criterion						
Original	25.8	24.5	6.8	15.7	-19.0	-8.8
Definite	22.5	21.1	12.2	19.4	-10.3	-1.7
Meaningful	31.1	28.1	20.6	35.2	-10.5	7.1
Efficient	17.3	21.1	43.3	22.9	26.0	1.8
Creative	3.3	5.2	17.1	6.8	13.8	2.9
Total	100	100	100	100	39.8	4.7
Development criterion						
Original	24.2	21.2	6.8	15.7	-17.4	-5.5
Definite	25.8	29.7	12.2	24.6	-13.6	-5.4
Meaningful	32.7	24.5	20.8	29.9	-11.9	5.4
Efficient	13.6	21.2	44.9	24.4	31.3	3.2
Creative	3.7	3.4	15.3	5.4	11.6	2.0
Total	100	100	100	100	42.9	5.2



According to the procedural criterion, the EG's dynamics (35.4%) are 28.6% higher than the CG's (6.8%). According to the motivational criterion, the dynamics in the EG (41.7%) exceed those in the CG (3.1%) by 38.6%. The reflexive criterion shows that the dynamics in the EG (39.8%) are 35.1% higher than those in the CG (4.7%). According to the development criterion, the EG (42.9%) has higher dynamics than the CG (5.2%) by 37.7%. Thus, digital etiquette-based teaching has been shown to have a positive effect on the digital communicative culture of EG (see Figure 4).

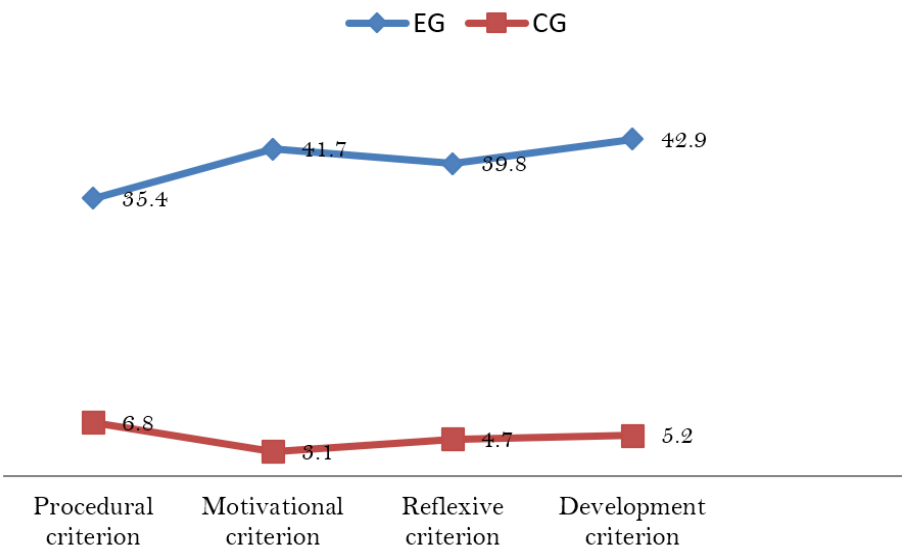


Figure 4. The dynamics of digital communication culture in the EG and CG.

The student's t-test was used to ensure data reliability. The studied feature was statistically indistinguishable ( $t_{emp} < t_{crit}$ ) indicating the homogeneity of the participant samples used. After the intervention, statistical distinctiveness ( $t_{emp} > t_{crit}$ ) and the conditionality of increasing the level of digital communicative culture through the introduction of a specially designed training program are shown in Table 4.

Table 4. Results of the student's t-test.

Criteria	Pre-test (EG and CG)		Post-test (EG u CG)	
	$t_{emp}$	$p = 0.05$	$t_{emp}$	$p = 0.05$
Procedural	0.262	$t_{crit} = 1.981$	2.664	$t_{crit} = 1.981$
Motivational	0.993		2.586	
Reflexive	0.491		3.072	
Developmental	0.424		3.341	

These findings support the conclusion that the process associated with establishing a digital communication culture in the EG is more effective. The data demonstrates the benefits of organizing the process of teaching digital etiquette skills to students using a theoretically-based algorithm for the formation of a digital communication culture over traditional training methods. On this basis, it was determined that the research hypothesis was confirmed. The tasks and the study's purpose were solved.

5. Discussion

This study is aimed at studying the influence of digital etiquette on the development of a culture of digital communication among prospective teachers in the context of Kazakhstan. The experimental group received seven weeks of digital etiquette training to achieve this goal. The initial section revealed the following problems for the experiment participants: low sociability and communication skills; self-doubt and isolation; lack of independence in judgment; inability to communicate professionally and inability to use digital technologies particularly netiquette. The reasons for the aforementioned difficulties were identified: the episodic use of communicative dialogue and interactive technologies in the educational process resulting in a monologue rather than a dialogic form of teaching in classes and extracurricular activities and a lack of orientation in extracurricular activities towards addressing the problems of forming a communicative culture. The participants lacked experience in constructive conflict resolution and were unmotivated to improve their communication skills. The lack of methodological support for the process of developing students' communication skills during school and extracurricular hours is also a major source of communication problems.

In the context of the course, an authors' program was developed and implemented to assist students in improving their digital competence as well as a set of measures to form students to develop a communicative culture through netiquette and the introduction of technology for individualization and personalization of learning (Shi, Lan, & Wan, 2023). The training involved three technological stages: formation, consolidation and transformation. The systematic progression through all technological stages ensures that the full potential of digital etiquette is realized and that maximum results are achieved.

EG participants have a positive attitude towards communication as a means of achieving goals when interacting with others. They use communication skills and speech culture in discussions and class activities and they are distinguished by a diverse set of speech techniques and communicative behavior strategies. They are involved in the communication process. They have a higher level of speech literacy (Davis & Murza, 2019; Marble-Flint, Schneider-Cline, Brumbaugh, Chavira, & Parham, 2022). The use of Telegram allowed students to discuss and exchange ideas and feedback on the network communication strategy project's progress.

An analysis of data on mastering communicative knowledge and skills in the EG as a result of taking the special course "Basics of Digital Etiquette" discovered that the EG had a higher coefficient. The significance of the difference by the student's t-test is at least 0.95 which confirms the research hypothesis. One of the main results of



the training is a qualitative change in the abilities of the participants in the EG for communicative activities. The experimental group's classes used the following methods: theoretical information was presented in the form of problem-based lectures and informational messages. The practical component included sensitive training, analysis, and solutions to specific situations that demanded a high level of communicative culture. The reflexive component was carried out through verbal and non-verbal reactions at the emotional and cognitive levels (Noor, Younas, Saleh Aldayel, Menhas, & Qingyu, 2022; Yu, Gao, & Wang, 2021).

The course "Basics of Digital Etiquette" focuses on learning about the essence, goals, objectives, principles, methods, content and specifics of activities and communication as well as the effectiveness of organizing activities and communication and the improvement of communication knowledge and skills. The program focuses on communication organization (trust, dialogue, mutual understanding, language unity and verbal and nonverbal communication methods). The proposed program serves three purposes: educational (introducing students to the phenomenon of communicative culture), developmental (creating motivation for students to improve their own communicative culture), and corrective (correcting students' communicative culture). The basic principles of teaching the course are problematic material presentation, student activity, individual and collective forms of student work, consideration of students' characteristics and a flexible algorithm for class management.

Sensitive skills training included four classes in which such conditions for constructive communication were created so that students developed the ability to feel a communication partner recognize his emotional state, analyze situations of interpersonal interaction based on the emotional reactions of partners and extract the experience necessary for successful communication in the future. The students were actively engaged in the training. The effectiveness of classes is due to such characteristic processes as the use of involuntary influence as a method, the impact on participants' emotional states, relieving tension, relaxing the situation and relaxing during classes, free and open expression by participants of their thoughts and feelings, active listening to others and the development of abilities and skills to analyze and draw conclusions (King & Chen, 2019; Rodríguez-Muñoz, Antino, Ruiz-Zorrilla, & Ortega, 2021). This strategy is improved by regularly checking participants' comprehension, asking questions and speaking directly to them. As a result, we can conclude that using a theoretically based algorithm to organize the process of teaching students digital etiquette skills has an advantage over traditional training in terms of the formation of a digital communicative culture.

## 6. Conclusion

This study investigates the effectiveness of digital etiquette's influence on the development of a digital communication culture among prospective teachers in Kazakhstan. The experimental group received seven weeks of digital etiquette training to accomplish this goal. Analysis of the preliminary testing results revealed that both groups were at the same level in terms of communicative culture indicators. In addition, participants had no prior knowledge of digital etiquette. A proprietary course program called "Basics of Digital Etiquette" has been created to ensure that participants' communication skills improve. This course is to get acquainted with the concepts and rules of digital etiquette and develop the skill of applying the rules of digital etiquette in the Internet space to build effective communication. A set of measures was carried out to develop a communicative culture through the means of netiquette and the introduction of technology for individualization and personalization of learning. This study found the impact of digital etiquette on the development of a digital communication culture in future teachers by providing new perspectives and access to scientific knowledge in the field of digital etiquette as well as the practical application of this knowledge to support cultural digital interaction.

## 7. Suggestions and Future Implications

When determining research prospects, additional research on the issue under consideration could be aimed at providing new perspectives and access to scientific knowledge in digital etiquette. Some issues also require special study in particular identifying new vectors for the development of the professional skills of teachers, improving their skills, mastering the basics of digital etiquette in professional communities, and pedagogical communications which can be indicators of teachers' readiness to exchange knowledge in a virtual environment. At the present stage of the development of the education system and society, there is an urgent need to improve not only professional competencies but also the psychological and pedagogical knowledge and communicative qualities of teachers. This is especially important in the context of the digitalization of all processes and building pedagogical activities in a virtual environment. A modern teacher has to both teach lessons using digital resources and expand his knowledge and exchange methodological ideas in online professional communities. Teachers also have to be aware of students' virtual activity and their communications and subscriptions on social networks. All of these aspects of a teacher's professional activity raise the need for general cultural improvement, mastery of media literacy and ethical standards of digital communication.

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