

D.K. Abilov^{1*}, A.R. Algozhina²

^{1,2}Karaganda Buketov University, Karaganda, Kazakhstan
(*Corresponding author's e-mail adk1996@mail.ru)

¹ORCID 0000-0002-0485-4869,

²ORCID 0000-0001-8771-0459

Emotional Intelligence of Future Teachers

Modern theories and models of emotional intelligence emphasize its importance for the formation of a holistic self-developing personality of a teacher. Research shows that in modern society, the success of an adult depends on his or her ability to manage both his or her own emotions and the emotions of others. People with high emotional intelligence tend to better manage their emotional state, which leads to greater adaptability and more effective communication. This article presents the results of an empirical study of the emotional intelligence of students in various educational programs focused on pedagogy. The study is aimed at determining the influence of various components of emotional intelligence on its overall level in students of pedagogical programs. The authors provided an analysis of the results of studies that suggest that the nature of students' educational and professional experience plays a decisive role in the development of emotional intelligence of novice teachers. The researchers emphasize that the development of emotional intelligence is a vital quality for future teachers. They highlight emotional awareness and empathy as key elements in the development of emotional intelligence. The results obtained have important theoretical and practical implications for improving teacher training programs.

Keywords: emotional intelligence, emotional awareness, emotion management, self-motivation, recognizing other people's emotions, empathy.

Introduction

In the course of studying modern concepts of emotional intelligence development and requirements for education experts, we would advocate the viewpoint that a teacher embodying a holistic, self-developing personality with a well-developed emotional intelligence is an ideal model for professional identification.

In his paper "Analysis of psychological theory of emotional intelligence," B.N. Turakulov discusses the importance of emotional intelligence in modern psychology. It covers various theories and models developed over the past century, further emphasizing the unity of affect and intelligence. Emotional intelligence is presented as crucial for understanding one's own and other people's emotions, ultimately leading to better decision-making and interpersonal relationships [1; 99–104].

J.D. Mayer, P. Salovey, D.R. Caruso, and L. Cherkasskiy discuss the study of emotional intelligence including personal factor of emotions in combination with the construct of intelligence, as well as methods for measuring emotional intelligence. Their research shows that the models of emotional intelligence and mental abilities can be characterized as standard intelligence and, empirically, they do meet the criteria of standard intelligence. Accordingly, emotional intelligence provides recognition of a new exciting area of human abilities [2; 528–549].

The term "emotional intelligence" is multifaceted and is yet to be clearly defined within contemporary psychology. Coined in 1990 by American psychologists P. Salovey and J. Mayer, it refers to a unique set of mental attributes, which includes the ability to comprehend one's own emotions, exhibit empathy, and regulate feelings [3; 396–420].

According to P. Salovey and J.D. Mayer, the foundation of emotional intelligence consists of a range of skills that enable individuals to accurately assess and express emotions in both themselves and others, effectively manage them, and use emotional insights for motivation and goal setting. The authors examined the place of emotions in traditional concepts of intelligence, and also described a basis for integrating research on emotion-related skills, and examined the components of emotional intelligence P. Salovey, & J.D. Mayer [4; 185–211].

P. Salovey and D. Grewal have presented a helpful framework for studying individual differences in abilities related to processing of emotional information. For their study, they would focus on J.D. Mayer and

P. Salovey's four-branch model that characterizes emotional intelligence as a set of four interrelated abilities: perception, use, understanding, and emotion management [5; 281–285].

C. Cherniss, M. Extein, D. Goleman, and R.P. Weissberg show a great empirical support that the theory of emotional intelligence currently has [6; 239–245]. In this regard, we have performed a study confirmed by real data collected during observation using questionnaires, which allowed us to confirm the hypothesis about components that are both the most and least influential on emotional intelligence of future teachers.

The study of emotional intelligence is aimed at preventing teacher burnout by increasing their ability to cope with daily classroom challenges. Empirically based programs are recommended as a direct and systemic component of the professional development of teachers both prior to and throughout their teaching careers [7; 377–402].

Teachers can develop emotional intelligence. N. Dolev, S. Leshem argue that Emotional Intelligence training programs can be effective in ensuring positive shifts and related behavior that can positively affect teacher practice, their sense of importance and their relationships with students [8; 21–39].

We endorse V. Kovalchuk et al.'s opinion that emotional intelligence of a future teacher is absolutely necessary and needs to be formed during the student period. That said, our study of a group of students of pedagogical educational programs is justified [9; 39–51].

A growing body of research in recent years has confirmed the value of emotional intelligence for both effective teaching and student achievements. M. Hen, & A. Sharabi-Nov present a quasi-experimental pre- and post-training study to evaluate the impact of a 56-hour Emotional Intelligence training model. The model has been developed and studied in an attempt to address the growing need for educators to practice and implement “emotionally intelligent” learning environments. This study has involved teachers from ten elementary schools in Israel. Results have shown an increase in emotional intelligence and empathy from the beginning to the end of the course. Further regression has shown that both emotional expression and regulation predicted empathy at the end of the course. Participants' reflective tasks have shown an increase in self-awareness, emotional awareness, emotional regulation, and understanding of others [10; 375–390].

Given the constant and rapid social changes, along with new challenges, elevated social expectations, and heightened professional standards, the importance of developing emotional intelligence is becoming increasingly significant, alongside other critical factors like competence and effectiveness. For future teachers, the ability to identify and regulate emotions is paramount, as they must navigate two key responsibilities: enhancing their own personal capabilities that underpin emotional intelligence and fostering emotional intelligence in their students. Aspiring educators need to seek out innovative methods and tools for understanding and managing emotions, as well as cultivating their empathy skills. Understanding emotional intelligence is crucial for teachers to form positive relationships with both peers and students. This pursuit is essential for developing self-awareness, understanding motivations and goals within the educational environment, influencing others' emotions, and enhancing leadership qualities.

There are good theoretical grounds to consider emotional intelligence (EI) is considered an important component of teachers' professional skills, which has a theoretical basis. However, there is insufficient data on the relationship between the level of EI among student teachers and their success in teaching. The study also considered the influence of gender and previous academic achievements as possible factors influencing pedagogical effectiveness. However, the relationship between these three variables and the effectiveness of teaching has not been identified, which casts doubt on existing ideas about the role of emotions in teaching [11; 35–42].

Materials and Methods

Emotional intelligence is an extremely important concept, especially among future teachers.

Emotional intelligence comprises three primary abilities: identifying and expressing emotions, regulating emotions, and utilizing emotional information in reflection and activities. Each ability further breaks down into several components. For example, the skill of identifying and expressing emotions is split into two facets. The first one is aimed at one's own emotions, the second one, at other people's emotions. Emotion regulation includes two components: regulation of one's own and other people's emotions. The use of emotions in reflecting and activities involves flexible planning, creative thinking, the ability to switch attention, and motivation, especially for future teachers.

The main goal of our study is to determine the emotional intelligence of future undergraduate teachers by measuring the constituent components of emotional intelligence and to determine the component with the greatest impact on the emotional intelligence of students.

We propose that there is a positive connection between overall emotional intelligence and its individual components, with empathy exerting the greatest influence.

The higher the emotional awareness, the higher the overall emotional intelligence level. The results will have important theoretical and practical significance.

For this purpose, we used the tests invented by the American psychologist Nicholas Hall. The N. Hall test for emotional intelligence is currently one of the most common methods for determining the level of emotional intelligence. Its main advantages are simplicity and accessibility making it ideal for self-diagnosis. [12; 6–14].

The Nicholas Hall test allows determination of the emotional intelligence level in several aspects at once:

Emotional awareness, which includes a person's understanding of emotions they experience and their causes. People with high emotional awareness are more aware of their internal state.

Own emotion management. This aspect implies a person's ability to influence their own emotions and restrain negative consequences of their manifestation. This includes emotional forgiveness, flexibility, etc.

Self-motivation refers to the capability to use one's emotions as a means to achieve personal goals.

Empathy involves understanding others' emotions, being sensitive to their feelings, and a willingness to offer support. It encompasses recognizing a person's emotional state through facial expressions, gestures, nuances in speech, and body language.

Recognition of other people's emotions is a person's ability to influence the feelings of others, use their emotions to achieve own and company goals, etc.

The scientist has proposed a method for identifying the main capabilities of understanding the relationships of the individual that can be presented in the emotional sphere, as well as the ability to manage emotions based on decision-making.

Oftentimes people have a hard time giving an objective assessment of their qualities while some test questions require the subject to provide such an evaluation. Nevertheless, this method remains one of the most popular in the world for measuring emotional intelligence.

Emotional intelligence consists of skills and behaviors that can be observed, measured, and ultimately improved. It is never too late to learn more about emotions to change the situation. The Hall test is one of the tools that allows for a quick and as effective learning as possible.

Data has been processed and analyzed using Microsoft Excel. The study used pivot tables to systematize data, statistical functions to calculate average values and deviations, and visualization tools such as charts and graphs to present the results clearly. Additionally, data filtering and sorting have been used to identify patterns. Correlation analysis was also conducted to assess the relationships between variables and regression analysis to identify the dependence of one variable on others.

The results obtained can be useful for further research on emotional intelligence in education. In addition, improving a teacher's emotional intelligence is useful for teaching and learning.

Results and Discussion

For this study, 178 undergraduate students in Pedagogical Sciences were surveyed using the Hall Emotional Intelligence Test.

This widely acknowledged assessment consists of 30 items rated on a 6-point scale known as Likert scale and is arranged into five distinct scales, each containing six non-overlapping items:

1. Emotional Awareness.
2. Managing Your Emotions (or emotional flexibility and non-rigidity).
3. Self-Motivation (or voluntary emotion management).
4. Empathy.
5. Managing Emotions of Others (or the ability to influence emotional states).

Participants responded to statements reflecting various life experiences. For each statement, they were offered a choice of options based on assessment of their answers.

Using the N. Hall test questionnaire, emotional intelligence was categorized based on partial scores for each scale: high (14 points or more), average (8 to 13 points), and low (7 points or less). The findings reflected the following. In general, the answers to the test we conducted using this method revealed a low level of emotional intelligence (see Table 1).

Table 1

Total Point Allocation by Scales

	Emotional Awareness	Managing Your Emotions	Self-Motivation	Managing Emotions of Others	Empathy
High	22.48	9.55	6.74	19.66	9.55
Average	38.76	24.72	38.76	37.08	41.01
Low	38.76	65.73	54.5	43.26	49.44
Total	100	100	100	100	100

Figure 1 shows allocation of respondents with average levels of responses across scales.



Figure 1. Scale Average

Empathy received a high average score of 41.01, suggesting respondents are adept at listening to others, attuned to the emotional needs of those around them, and skilled at interpreting social cues. It encompasses the ability to connect with another's emotional condition through facial expressions, gestures, vocal tones, and body language, as well as a readiness to offer assistance.

Emotional Awareness scored an average of 38.76, indicating a strong understanding of one's own emotions and a continuous effort to enhance emotional vocabulary. People with high emotional awareness are more aware of their internal state than others.

For the Self-Motivation component (38.76), respondents have demonstrated their ability to stay calm and focused, to evoke a wide range of positive emotions, such as fun, joy, inner uplift, and humor, to approach roughs and tumbles of life creatively, to easily discard negative feelings. Self-motivation is based on understanding own needs and the ability to consistently satisfy them.

Managing Emotions of Others (37.08) is the ability to influence the emotional state of other people, to help calm them, to respond appropriately to their impulses and desires, and also help improve their mood.

Managing Your Emotions has shown the lowest score (24.72 %), which may indicate difficulties in controlling an emotional state. Emotion management requires special attention.

Overall, the study has shown a low students' emotional intelligence according to the interpretation of the test results.

Figure 2 shows the results of the test and the overall integrative level of emotional intelligence.

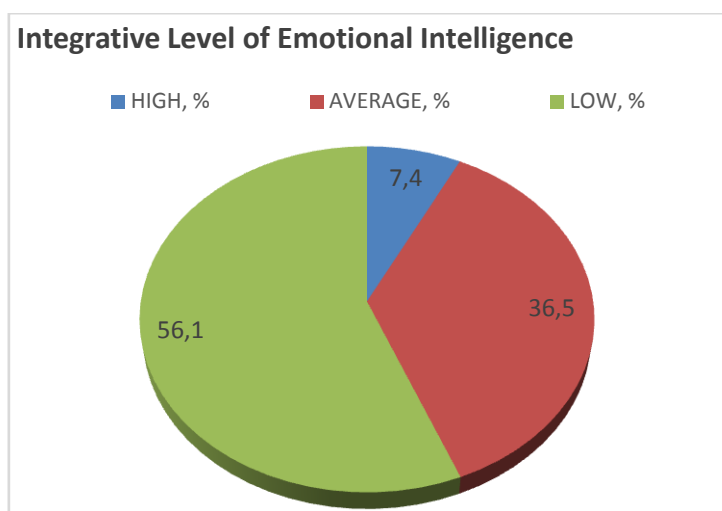


Figure 2. Integrative Level of Emotional Intelligence

A notable number of students (56 %) struggled to recover quickly from unexpected disappointments, experienced prolonged states of negative emotions, and faced challenges managing their feelings.

We have determined paired correlation coefficients or, simply put, identified each factor's (Emotional Awareness, Managing Your Emotions, Self-Motivation, Managing Emotions of Others, Empathy) influence on emotional intelligence (see Table 2).

Table 2

Correlation and Elasticity Coefficients

Indicators	Emotional Awareness	Managing Your Emotions	Self-Motivation	Managing Emotions of Others	Empathy
Coefficient of Correlation	0.83	0.77	0.85	0.86	0.85
Coefficient of Determination R^2	0.68	0.6	0.73	0.73	0.73
Mean Value X	8.8	4.7	6.7	7.7	7.4
Coefficient b	3.4	2.9	4	3.2	3.9
Elasticity Coefficient	0.85	0.39	0.76	0.7	0.82

The following is a more detailed analysis of relationships between individual components and their impact on formation of emotional intelligence.

In our study, the significance of F is below 0.05. In regression analysis, it cannot exceed 0.05. The significance of F indicates high reliability of the results and absence of randomness or presence of a pattern justified in our study. High reliability of the model indicates that the probability or the results' randomness is below 5 %. This means that the identified pattern is not random. It also confirms presence of a real relationship between the variables, i.e., our model admittedly explains variation of the dependent variable (emotional intelligence). The model is suitable for analysis because the low level of significance of F confirms that the factors included in the model (Emotional Awareness, Managing Your Emotions, Self-Motivation, Empathy, And Managing Emotions of Others) show a significant impact. Accordingly, we can state with high confidence that regression model is valid and identified patterns admittedly reflect real relationships between variables.

The correlation coefficient R illustrates the relationship's strength between the emotional intelligence components and overall emotional intelligence. The analysis revealed a statistically significant positive correlation between the overall emotional intelligence score and its individual component scales. Particularly

high correlations were found between Managing Others' Emotions and Emotional Intelligence (0.86), Empathy and Emotional Intelligence (0.85), and Self-Motivation and Emotional Intelligence (0.85), indicating that these elements are essential for overall emotional intelligence. Conversely, the correlation between Managing Your Emotions and Emotional Intelligence was lower (0.77), suggesting greater difficulties in regulating students' emotional states.

The determination coefficient shows the part of emotional intelligence variability explained by a specific variable. In our study, emotional intelligence is explained by the model by 60–73 %, which indicates its sufficient predictive ability. The model explains more than a moderate and good amount of data variation. This indicates presence of significant factors while the model describes behavior of the dependent variable quite well. Self-Motivation, Emotion Recognition and Empathy show a value of $R^2 = 0.73$, which indicates a high degree of explainability of these factors. Emotional Awareness ($R^2 = 0.68$) explains 68 % of variability, which is also high. Emotion management ($R^2 = 0.6$) has the lowest value, which indicates its lower predictive power in the model.

Analysis of the mean value demonstrates the average level of development of each component. Emotional awareness (8.8) is the most developed ability among respondents. The lowest score is emotion management (4.7), which indicates possible difficulties with self-control. Self-motivation (6.7), emotion recognition (7.7) and empathy (7.4) are at an average level. The b coefficients (contribution to general emotional intelligence) show how much each factor influences the general level of emotional intelligence. Self-motivation ($b = 4.0$) has the greatest influence, empathy ($b = 3.9$) also significantly influences general emotional intelligence. The smallest coefficient is for emotion management ($b = 2.9$), which indicates its comparatively smaller contribution. The elasticity coefficient is an indicator characterizing the measure of sensitivity of the studied value in relation to the factors on which it depends. The elasticity coefficient in regression analysis shows by what percentage, on average, the result will change if the factor changes by 1 %, that is, by what percentage the general level of emotional intelligence will change if the corresponding component changes by 1 %. Emotional awareness (0.85) and empathy (0.82) have the greatest elasticity, which indicates the high significance of these factors. Self-motivation (0.76) and emotion recognition (0.7) also have a significant impact. Managing Your Emotions show the lowest value (0.39), which indicates its weak impact on overall emotional intelligence.

To summarize, emotional intelligence is more sensitive to changes in emotional awareness and empathy and is less sensitive to managing one's emotions.

According to the results of the study, using the N. Hall method, the most developed components of emotional intelligence in students were self-motivation and emotion recognition. An analysis of the nature of these relationships allows us to conclude that self-motivation is of paramount importance for the successful adaptation of students.

Conclusion

The empirical study performed as part of this work has confirmed the existence of a close positive relationship between individual components and students' emotional intelligence. Correlation analysis has revealed statistically significant positive relationships between the general level of emotional intelligence, as well as between individual components of these constructs. The results are of great theoretical and practical consequence. The most significant components, according to N. Hall's questionnaire, are self-motivation, empathy and emotion recognition since they show a high coefficient of influence and elasticity. Emotional awareness is the most developed one but it is not always accompanied by effective management of own emotions. The biggest issue is managing own emotions that may require additional efforts to develop self-control. To improve emotional intelligence, it is worth paying attention to the development of empathy, self-motivation, and skills in recognizing the emotions of others.

This analysis can be useful both in personal development and in the professional sphere to improve interpersonal relationships and self-regulation of future teachers.

They expand scientific understanding of the nature of emotional intelligence, and can also be used to develop emotional intelligence development programs, psychological counseling, professional selection, and educational programs aimed at improving psychological stability of students. Further research in this area can focus on studying the influence of personal and environmental factors on the relationship between emotional intelligence and stress resistance, psychological stability.

High stress levels and increasing burnouts in teaching require new means of improving stress management and improving the well-being of future teachers, which are the key to effective learning and student

academic progress. A growing body of evidence indicates that development of emotional intelligence through training can positively affect a wide range of psychological outcomes, resulting in improved health and psychological stability, and, apparently, has direct application to maintaining psychological stability of teachers. The results of the study can be applied in the development of programs to improve the quality of emotional intelligence.

Enhancing the overall level of emotional intelligence can be accomplished through targeted training and psychological practices focused on recognizing and managing emotions. Emotional intelligence is essential for conflict resolution and anticipating outcomes within a professional teaching context.

References

- 1 Norboevich, T.B. (2020). Analysis of psychological theory of emotional intelligence. *European Journal of Research and Reflection in Educational Sciences*, 8(3), 99–104. Retrieved from <https://www.idpublications.org/wp-content/uploads/2020/03/Full-Paper-ANALYSIS-OF-PSYCHOLOGICAL-THEORY-OF-EMOTIONAL-INTELLIGENCE.pdf> -
- 2 Mayer, J.D., Salovey, P., Caruso, D.R., & Cherkasskiy, L. (2011). Emotional intelligence. In *The Cambridge handbook of intelligence* (pp. 528–549), chapter 26. R.J. Sternberg & S.B. Kaufman (Eds.). Cambridge university Press. <https://doi.org/10.1017/CBO9780511977244.027>
- 3 Mayer, J.D., Salovey, P., & Caruso, D.R. (2000). Models of Emotional intelligence. In *Handbook of Intelligence*. Cambridge University Press, 396–420. Sternberg R.J. (Ed.). <https://doi.org/10.1017/CBO9780511807947.019>
- 4 Salovey, P., & Mayer, J.D. (1990). Emotional intelligence. *Imagination, Cognition and Personality*, 9(3), 185–211. <https://doi.org/10.2190/DUGG-P24E-52WK-6CDG>
- 5 Salovey, R., & Grewal, D. (2005). The Science of Emotional Intelligence. *Current Directions in Psychological Science* 14(6), 281–285. <https://doi.org/10.1111/j.0963-7214.2005.00381.x>
- 6 Cherniss, C., Extejn, M., Goleman, D., & Weissberg, R.P. (2006). Emotional intelligence: what does the research really indicate? *Educational psychologist*, 41(4), 239–245. https://doi.org/10.1207/s15326985ep4104_4
- 7 Vesely-Maillefer, A.K., & Sakolovske, D.H. (2018). Emotional intelligence and the next generation of teachers. *Emotional intelligence in education: Integrating research with practice*, 377–402. https://doi.org/10.1007/978-3-319-90633-1_14
- 8 Dolev, N., & Leshem, S. (2017). Developing emotional intelligence competence among teachers. *Teacher development*, 21(1), 21–39. <https://doi.org/10.1080/13664530.2016.1207093>
- 9 Kovalchuk, V., Prylera, I., Marynchenko, I., Opanasenko, V., & Marynchenko, Y. (2002). Development of emotional intelligence of future teachers of professional training. *International Journal of Early Childhood Special Education*, 14(1), 39–51. Retrieved from <https://pdfs.semanticscholar.org/11a6/3898585ce53183e188769a0f89dcc50ea099.pdf>
- 10 Hen, M., & Sharabi-Nov, A. (2014). Teaching the teachers: Emotional intelligence training for teachers. *Teaching education*, 25(4), 375–390. <https://doi.org/10.1080/10476210.2014.908838>
- 11 Corcoran, R.P., & Tormey, R. (2013). Does emotional intelligence predict student teachers' performance? *Teaching and teacher education*, 35, 34–42. <https://doi.org/10.1016/j.tate.2013.04.008>
- 12 Doroshkevych, D., & Ilyash, O. (2020). The Investigation of Emotional Intelligence Level in Non-Government Organization with the Use of Hall's Test. *The Journal of International Scientific Researches*, 5(Ek), 6–14. <https://doi.org/10.23834/isrjournal.709199>

Д.К. Абилов, А.Р. Альгожина

Болашақ педагогтардың эмоционалды интеллектісі

Эмоционалды интеллекттің заманауи теориялары мен модельдері педагогтың біртұтас өзін-өзі дамыатын тұлғасын қалыптастырудағы маңыздылығын көрсетеді. Қазіргі ғылыми зерттеулер ересек адамның заманауи қоғамдағы жетістікке жетуі академиялық білім мен жалпы интеллект деңгейімен ғана емес, сонымен қатар өзінің эмоционалды жағдайын және басқа адамдардың да эмоционалды көңіл-күйін басқара алу ептілігімен де анықталатынын дәлелдейді. Эмоционалды интеллектісі жоғары дамыған адамдар өздерінің эмоционалды көңіл-күйін басқара алудың айқын қабілеттеріне ие, бұл жоғары бейімделгіштік пен қарым-қатынастағы нәтижелілікті қамтамасыз етеді. Мақалада педагогикалық бағыттағы әртүрлі білім беру бағдарламаларында оқитын студенттердің эмоционалды интеллекті деңгейін анықтаудың эмпирикалық зерттеу нәтижелері келтірілген. Авторлар студенттердің білім беру және кәсіби тәжірибесінің сипаты бастаушы оқытушылардың эмоционалды интеллектісін дамытуда шешуші рөл атқаратындығын көрсететін зерттеу нәтижелеріне талдау жасады. Зерттеушілер эмоционалды интеллекті дамыту болашақ педагогтар үшін маңызды қасиет екенін атап өтеді. Олар эмоционалды сана мен эмпатияны эмоционалды интеллект дамуының негізгі

элементтері ретінде көрсетеді. Алынған нәтижелер болашақ педагогтерді даярлау бағдарламаларын жақсарту үшін маңызды теориялық және практикалық мәнге ие.

Кілт сөздер: эмоционалды интеллект, эмоционалды хабардарлық, өз эмоцияларын басқару, өзін-өзі ынталандыру, басқа адамдардың эмоцияларын тану, эмпатия.

Д.К. Абилов, А.Р. Альгожина

Эмоциональный интеллект будущих педагогов

Современные теории и модели эмоционального интеллекта подчеркивают его важность для формирования целостной саморазвивающейся личности педагога. Исследования показывают, что в современном обществе успех взрослого человека зависит от его способности управлять как своими собственными эмоциями, так и эмоциями других. Люди с высоким эмоциональным интеллектом склонны лучше управлять своим эмоциональным состоянием, что приводит к большей адаптивности и более эффективному общению. В данной статье представлены результаты эмпирического исследования эмоционального интеллекта студентов различных образовательных программ, ориентированных на педагогику. Исследование направлено на определение влияния различных компонентов эмоционального интеллекта на его общий уровень у студентов педагогических программ. Авторы предоставили анализ результатов исследований, из которых следует, что характер образовательного и профессионального опыта студентов играет решающую роль в развитии эмоционального интеллекта начинающих преподавателей. Исследователи подчеркивают, что развитие эмоционального интеллекта является жизненно важным качеством для будущих педагогов. Они выделяют эмоциональную осведомленность и эмпатию как ключевые элементы развития эмоционального интеллекта. Полученные результаты имеют важное теоретическое и практическое значение для улучшения программ подготовки преподавателей.

Ключевые слова: эмоциональный интеллект, эмоциональная осведомленность, управление своими эмоциями, самомотивация, распознавание эмоций других людей, эмпатия.

Information about the authors

Abilov, D.K. — PhD Student EP “8D01102- Psychology of Education”, Karaganda Buketov University, Karaganda, Kazakhstan; e-mail: adk1976@mail.ru, ORCID ID: 0000-0002-0485-4869

Algozhina, A.R. — PhD, Associate Professor, Karaganda Buketov University, Karaganda, Kazakhstan; e-mail: anar.algozhina@mail.ru, ORCID ID: 0000-0001-8771-0459, Researcher ID: -HTP-5627-2023