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**Research on Academic Giftedness of Future Teachers**

Дослідження академічної обдарованості майбутніх учителів

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The aim of the research is to establish psychological content parameters, correlations and factors of future teachers’ academic giftedness. It was assumed that personal factors of future teachers’ academic giftedness would have statistically significant correlations with academic performance and parameters of intelligence; the research groups distributed by academic performance evaluation would have significant differences by personal factors of academic giftedness, verbal, mathematical and spatial intelligence.

Methods. The research participants were the 2nd–4th year full-time students pursuing a degree in pedagogy at three higher education institutions: two institutions from Kazakhstan – Abai Kazakh National Pedagogical University (Abai KNPU), Auezov South Kazakhstan University (Auezov SKU) and one institution from Bulgaria – “Angel Kanchev” University of Ruse (RU “Angel Kanchev”), numbering 258 people aged from 18 to 22 years. The method for diagnosing personal factors of giftedness (PFG) (Belksaya, 2019); “Intelligence structure test” (IST 2000) (Amtchauer et al., 2001) were applied. An additional variable – academic performance evaluation (APE) – was used.

Results. Pearson’s correlation analysis \((R)\) allowed establishing fifteen correlations \((p \leq .050; p \leq .010; p < .001)\) between the factors of academic giftedness, the types of intelligence and academic performance evaluation. It was found that the factor of giftedness “over-situational activehness” has the largest number of significant correlations – four \((p < .001; p \leq .050)\). It was substantiated that the factor is the most important and the most dependent one in future teachers’ academic giftedness. The Mann-Whitney U-test allowed establishing a statistically significant advantage of Group 2 (a high level of academic performance evaluation) by the parameter “over-situational activity” \((U = 6340.000; p < .040)\). It was explained that the respondents’ over-situational activity is a backbone factor of future teachers’ academic giftedness.

Discussion and conclusions. The obtained empirical results and the established statistically significant correlations and differences possess scientific novelty and applied value. A number of recommendations concerning reorganization and implementation of innovative processes of training future teachers aimed at developing academic giftedness and providing quality psychological-pedagogical support for gifted students were made.

Keywords: phenomenon of giftedness, academic performance, students, educational environment, educational-professional activity, higher education institution.
Introduction

Students’ academic giftedness determines the quality of educational process on the whole. Practice shows that the deeper a student is engaged in the process of learning new information, the higher their academic performance evaluation is. Future teachers’ academic giftedness is related not only to high results in the process of professional education, but also to probability of transforming a high-potential student into a talented teacher of a comprehensive school. Academic giftedness also means a high probability of future practical activeness of a student in their specialization, development of a successful pedagogical career and the ability to educate a talented generation.

Pedagogical education as a training direction is not a priority for potential future teachers. At the same time the researched direction is a priority for educational systems of Kazakhstan and Bulgaria. Nowadays attention is focused on new specializations meeting the conditions of active technological development, in particular, educational engineering, pedagogy in the area of robotechnics, game-based pedagogy, innovatics, etc.

Academic giftedness is an important aspect of educational specialization, remaining a key element instilling the fundamentals of worldview in consciousness of the younger generation, and also the approaches to world outlook, determining topicality of future teachers’ academic giftedness. Therefore, elucidating conditions for maintaining future teachers’ academic giftedness in the activity of a relevant federal agency is an important issue.

When training future professionals in the field of pedagogy, higher education institutions believe that students have inborn dispositions and abilities for performing relevant activity. Consequently, universities are oriented towards educating a professional with certain integral, general and special competences, mainly provided by educational components of academic programs. The development of such academic programs implies that future teachers have sufficient intellectual resources to meet the educational standard, focuses on the formation of psychological readiness for future pedagogical activity. However, practice of universities shows that dispositions and abilities of such students are not even and equal. One of the reasons for...
this phenomenon is a different level of giftedness concerning pedagogical activity in students.

Scientists still discuss the concept of giftedness and also the appropriateness of using this predictor in relation to future teachers. Researcher J. Borland (2021) argues that giftedness as a phenomenon has ceased to be a natural human resource. It can be instilled in anyone since giftedness is a constructed strategy and a result of purposeful educational activity. E. Winner (2000) believes that many people regard giftedness as an individual's possession of qualitatively different resources, which allow them improve themselves more intensively than others. The criterion for identifying potential giftedness is an ability to ask deep philosophical questions and seek answers to them. This talent and relevant talents manifest themselves, in particular, as a result of inborn abilities. With regard to it E. Winner (2000) indicates a non-standard predictor, that among the gifted people there are differences in the degree of possession of unique intellectual qualities. In particular, researchers R. Subotnik et al. (2011) highlight that giftedness is wrongly considered to be a social advantage. They found those unique abilities are significant only in that cases if they are important in an applied aspect. Moreover, researchers paid attention to the fact that giftedness is a unique trajectory of self-enhancement in different areas that indicates inequality of gifted people from different fields of activity. On the other hand, they found that giftedness is temporary, since each gifted individual achieves their peak growth and experiences a professional or intellectual crisis later. In addition, universalization of giftedness is incorrect because of differential opportunities for people with special abilities in this or that social space (Subotnik et al., 2011).

Researchers F. Preckel et al. (2015) focused their attention on unobvious attempts to identify gifted people in educational process, i.e. on standard difficulties in their social adaptation. L. Kershen (2015) thinks that the label of giftedness actually plays a role of a hindering factor in the process of education both for a teacher and a learner. A differentiated approach to gifted students causes additional difficulties for realization of educational process, designed for universal instruments

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of Educational Society
and students with standard indicators of readiness to acquire information (Kershen, 2015). J. Peterson (2006) partly confirms validity of the evidences of the above mentioned researcher and suggests considering the phenomenon of giftedness within psycho-emotional development, which allows students to independently search for important information concerning education and not to initiate radical changes in academic programs, since they apply a universal approach to education (Peterson, 2006). D. Ford (1995) has a different opinion and believes that universality of educational process often prevents identification of gifted students who are not inclined to actively prove themselves in different academic or extracurricular activities because of their upbringing, previous education and for other reasons (Ford, 1995).

A variety of viewpoints on the concept of academic giftedness also poses a serious scientific problem, since different opinions focus attention on a considerable number of quality characteristics of students' academic giftedness that incentivizes taking into consideration different components as a basis for studying this phenomenon. M. Kaiser, S. Seitz (2023) emphasize that academic giftedness is always associated with educational justice which can be provided to students solely by a teacher. Educational justice is considered to be a set of instruments and technologies which allow revealing unique abilities of all students despite their personal qualities. Researchers W. Walsh et al. (2023) are inclined to regard academic giftedness as symbiosis consisting of students’ self-regulation, self-control adaptive capacities. M. McCreary (2023) believes that academic giftedness is a component of creation process, and, consequently, any student can achieve unique results in the process of education. Retrospective analysis allows generalizing that, given the above scientific statements and conclusions, future teachers’ academic giftedness can be developed provided that a unique system is created. This system should consider: reflexive competence as a basis for constructing educational process, inclination toward philosophical studies, a reasonable trajectory for training future teachers, conditions for adaptation of students (2015) вважає, що ярлик обдарованості насправді виконує роль перешкоджаючого чинника у процесі навчання як викладача, так і того, хто засвоює знання. Диференційний підхід щодо обдарованих студентів створює додаткові труднощі для реалізації освітнього процесу, що розрахований на універсальні інструменти та студентів зі стандартними показниками щодо готовності сприймати нову інформацію (Kershen, 2015). J. Peterson (2006) почасти підтверджує обґрунтованість доказів попереднього дослідника і пропонує розгля- дати феномен обдарованості в межах психоемоційного розвитку, який дозволяє студентах самостійно шукати важливу інформацію освітнього характеру та не ініціювати суттєві зміни в навчальних програмах, оскільки вони реа- лізовують універсальний підхід до навчання (Peterson, 2006). D. Ford (1995) дотримується іншого погляду і вважає, що універсальність освітнього процесу часто не дозволяє визна- чити обдарованих студентів, які через своє виховання, попередню освіту та інші можли- вості не схильні себе активно проявляти в різ- них навчальних та позанавчальних заходах (Ford, 1995).

Розмаїття точок зору щодо поняття акаде- мічної обдарованості також складає не меншу наукову проблему, оскільки різні точки зору фокусять увагу на значному переліку якіс- них характеристик академічної обдарованості студентів, що спонукає брати до уваги різні компоненти за основу вивчення зазначеного феномену. M. Kaiser, S. Seitz (2023) зазначають, що академічна обдарованість завжди пов’язана з освітньою справедливістю, яку студентам може забезпечити виключно викладач. Під освітньою справедливістю вони розуміють набір інструментів та технологій, що дозволяють розкривати унікальні здібності всіх студентів незалежно від їхніх особистис- них характеристик. Дослідники W. Walsh et al. (2023) схильні розглядати академічну обдарованість як симбіоз, що складається із саморе- гуляції, самоврядування та адаптивних мож- ливостей студентів. M. McCreary (2023) вважає, що академічна обдарованість є складовою творчого процесу, а, отже, будь-який студент може досягти унікальних результатів у про- цесі навчання. Ретроспективний аналіз дає підстави узагальнити, що, з огляду на вищена- ведені наукові твердження й висновки, досягнення академічної обдарованості майбутніх
with noticeable academic giftedness in a university society, preconditions for psycho-emotional development and manifestation of educational justice. Gr. Lauwers (2019) mentions an additional component—the necessity to reform the educational process of future teachers, in particular, permanent certification at the stage of taking university courses. Researchers K. Anand and M. Lall (2022) underscore the necessity of permanent control over the dynamics of school education aimed at timely implementation of effective instruments in the process of future teachers' education. The research of A. Kariyev et al. (2022) proves that interactive educational technologies are a factor of subjectivity of higher education students. There are studies establishing that there is a direct correlation between safe educational space and respondents’ motivational orientation (Blynova et al., 2020; Prokhorenko et al., 2023), external factors have a considerable impact on teachers’ dominant mental states in the process of distance education (Kalka et al., 2022; Popovych et al., 2023a), social expectations have a correlation with personality traits (Halian et al., 2023a) and depends on a teacher’s personal qualities and constructiveness of their interaction (Halian et al., 2023b). Thus, accumulation of scientific approaches can create an optimal educational system which enhances the abilities of future teachers to acquire knowledge of different levels of complexity during their educational-professional training.

Academic giftedness is considered to be students’ ability to successfully master educational materials, do educational tasks on time, actively participate in a social life of their higher education institution, tolerate uncertainty and be agents of innovations.

**Hypothesis.** Personal factors of future teachers’ academic giftedness will have statistically significant correlations with academic performance and parameters of intelligence; the investigated groups distributed by academic performance will have significant differences by personal factors of academic giftedness, verbal, mathematical and spatial intelligence.
The aim. To establish psychological content parameters, correlations and factors of future teachers' academic giftedness.

Methods

Participants. The research participants were the 2nd–4th year full-time students pursuing a degree in pedagogy at three higher education institutions: two institutions from Kazakhstan – Abai Kazakh National Pedagogical University (Abai KNPU), Auezov South Kazakhstan University (Auezov SKU) and one institution from Bulgaria – “Angel Kanchev” University of Ruse (RU "Angel Kanchev"), numbering 258 people aged from 18 to 22 years. Auezov SKU was represented by n=76 students comprising 29.46% of the sample; n=89; 34.50% students from Abai KNPU and n=93; 36.04% students from RU "Angel Kanchev" participated in our research. The descriptive frequency characteristic of the sample has the following parameters: M=19.46; SD=±3.04; Me=19.50; Mo=20.00. The sample has the following distribution by gender: males (n=75; 29.07%) and females (n=183; 70.93%).

Organization of the research. The research was conducted by a summative strategy on the scientific topics of the academic departments of higher education institutions. The research complied with the strategic plan and was within the scope of activity of Kazakhstan relevant federal agency. The research was approved by the scientific-methodological departments of Abai KNPU, Auezov SKU and the ethical committee of RU "Angel Kanchev". There were more than 258 participants in the research, but, at the stage of data processing, we selected only those forms of the questionnaires which were completed and did not contain controversial data. The survey was carried out in April – May of the 2022–2023 academic year. In June, 2023 we made a request for academic performance evaluation of the respondents who comprised the sample. The research results were processed and registered in September – October of the 2023–2024 academic year. Empirical data were collected through personal accounts of students' electronic systems. The research met the requirements of awareness, voluntariness and confidentiality that ensured a high percentage of participation, and also significance and reliability of the obtained empirical data.
Procedures and Instruments. The key psycho-diagnostic instrument used in the research was the method for diagnosing personal factors of giftedness (PFG) (Belskaya, 2019). The method combined eighty-two statements, contained a bipolar four-point Stapel scale with the following variants of responses: “-2” – do not agree, “-1” – rather disagree, “1” – rather agree, “2” – agree. The variance of the obtained "raw" scores implied the range from negative scores to positive ones. The method contains normative scales of converting "raw" scores into sten scores – from 1 to 10 stens, that was used when processing empirical results.

The method scales: over-situational activeness (OA), creative dysfunctionality (CD), intuition (І), risk inclination (RI) and reproductive activeness (RA). We used "Intelligence structure test" (IST 2000) (Amtchauer et al., 2001) for diagnosing verbal intelligence (by means of subtests 1–5), mathematical intelligence (by means of subtests 6–7) and spatial intelligence (by means of subtests 8–9). We used standard certified materials of subtests, recommended for diagnosing intelligence of individuals aged 13–61 years. The test consisted of 176 tasks which were done by the respondents for 90 minutes. The time for doing the task was automatically registered in personal accounts of the students' electronic systems. One point was awarded for each correct answer. Consequently, we obtained three ranges of levels: from 0 to 60 points – a low level; from 61 to 130 points – a medium level; from 131 to 176 points – a high level. Reliability of the internal consistency was assessed by Cronbach's alpha. By the method "PFG" (Belskaya, 2019), Cronbach's $\alpha$ equaled .732, that is a satisfactory level. By the method "IST 2000" (Amtchauer et al., 2001), Cronbach's $\alpha$ was .784, that is a satisfactory level. Academic performance evaluation (APE) was established by the method used in Kazakhstan educational system. The students' academic achievements by all academic subjects and training courses were assessed by the letter grading system for knowledge evaluation, related to a traditional scale of marks. Results of the Bulgarian students' academic performance were converted into APE. Tabl. 1 gives the parameters of the applied evaluation system.
The data on the respondents’ academic performance evaluation were provided by the scientific-methodological departments of the higher education institutions by the results of the 2022–2023 academic year.

**Variables.** The factors of future teachers’ academic giftedness – over-situational activeness, creative dysfunctionality, intuition, risk inclination and reproductive activeness – were dependent variables. The parameters of verbal, mathematical and spatial intelligence were independent variables. An additional variable – academic performance assessment – was used to establish correlations of the dependent variables with the indicators of performance.

**Statistical Analysis.** The empirical data were collected from the participants’ personal accounts. Standard forms were Google forms with automatized data processing by the scales. Then, the collected empirical data on each respondent were processed by the computer program "SPSS" (version 17.0.3). The following statistically significant coefficients
doсягнення студентів за всіма видами навчальних предметів і практик оцінювали за бально-рейтинговою буквеную системою оцінки знань, яка має зв’язок із традиційною шкалою оцінок. Результати успішності болгарських студентів було переведено в АОУ. У табл. 1 подано параметри застосованої системи оцінювання.

Отримані дані академічної оцінки успішності респондентів були надані науково-мето-
dичними відділами закладів вищої освіти за результатами 2022–2023 навчального року.

**Змінні.** Залежними змінними є фактори академічної обдарованості майбутніх педагогів: надситуативна активність, творча дис-
fункційність, інтуїція, схильність до ризику й репродуктивна активність. Параметри вер-
бального, математичного і просторового інте-
lекту склали перелік основних незалежних змінних. З метою з’ясування закономірностей залежних змінних із показниками результаталь-
tивності було введено додаткову зміну – ака-
dемічну оцінку успішності.

**Статистичне аналізування.** З особистих
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were used: Cronbach’s α, Pearson’s correlation coefficient (R) and Student’s t-test. The differences between the researched groups were identified by the Mann-Whitney U-test. The levels of statistical significance used in statistical analysis were – p≤.050, p≤.010 and p <.001.

Results

The results of the empirical cross-section were determined by the method for diagnosing personal factors of giftedness (Belskaya, 2019), “Intelligence structure test” (Amtchauer et al., 2001) and academic performance evaluation. The computer program “SPSS” (version 17.0.3) was used to determine the main descriptive frequency characteristics which are given in Tabl. 2 by all the parameters.

We performed comparison of the obtained descriptive frequency characteristics with the mean by the scales of the method for diagnosing personal factors of giftedness proposed by N. Belskaya (2019) and did not find significant differences. By “Intelligence structure

Table 2. Empirical research data given by descriptive frequency characteristics (n=258)

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<tr>
<th>Parameters</th>
<th>Min</th>
<th>Max</th>
<th>Me</th>
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Note: Min – minimum value; Max – maximum value; Me – median (in italics); Mo – mode; M – mean; SD – mean squared deviation; S – skewness; K – kurtosis; OA – over-situational activeness; CD – creative dysfunctionality; I – intuition; RI – risk inclination; RA – reproductive activeness; VI – verbal intelligence; MI – mathematical intelligence; SI – spatial intelligence; APE – academic performance evaluation.

Примітка: Min – мінімальне значення; Max – максимальне значення; Me – медиана (використано курсив); Mo – мода; M – середне арифметичне значення; SD – середня квадратична значення; A – асиметрія; E – ексцес; NA – надсituативна активність; TD – творча дисфункційність; I – інтуиція; CR – схильність до ризику; PA – репродуктивна активність; VI – вербальний інтелект; MI – математичний інтелект; PI – просторовий інтелект; AOU – академічна оцінка успішності.
test” (Amtchauer et al., 2001), the respondents demonstrated medium indicators by all the types of intelligence, but no statistically significant differences were identified. Comparison of the descriptive frequency characteristic of the samples of the Kazakh and Bulgarian students did not show statistically significant differences, therefore, all the following statistical analyses were performed on the total sample. We have reason to think that the sample selected randomly is within the recommended norms by their measurements.

Using Pearson’s correlation coefficient (R), we established correlations between the dependent and independent variables and the additional variable. Tabl. 2 gives correlations of the research on future teachers’ academic giftedness.

We can state that the respondents’ personal factors of giftedness have statistically significant correlations with the researched parameters. The fifteen correlations testify to a high degree of interdependence of the researched parameters. The factor of giftedness “oversituational activeness” has the largest number of significant correlations – four (p<.001; p≤.050). It also has the strongest positive correlation with verbal intelligence (R=.715; p<.001), that allows considering this factor the most important and the most dependent one.

<table>
<thead>
<tr>
<th>Scales Шкали</th>
<th>Pearson, R Пірсон, R</th>
<th>Parameters Параметри</th>
<th>VI BI</th>
<th>MI MI</th>
<th>SI PI</th>
<th>APE АОУ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over-situational activeness (OA) Надситуативна активність (НА)</td>
<td>R</td>
<td>.715**</td>
<td>.542**</td>
<td>.577**</td>
<td>.134*</td>
<td></td>
</tr>
<tr>
<td>Creative dysfunctionality (CD) Творча дисфункційність (ТД)</td>
<td>p</td>
<td>&lt;.001</td>
<td>&lt;.01</td>
<td>&lt;.001</td>
<td>.032</td>
<td></td>
</tr>
<tr>
<td>Intuition (І) Інтуїція (І)</td>
<td>R</td>
<td>-.694**</td>
<td>-.687**</td>
<td>-.639**</td>
<td>-.087</td>
<td></td>
</tr>
<tr>
<td>Risk inclination (RI) Схильність до ризику (СР)</td>
<td>p</td>
<td>&lt;.001</td>
<td>&lt;.01</td>
<td>&lt;.001</td>
<td>.163</td>
<td></td>
</tr>
<tr>
<td>Reproductive activeness (RA) Репродуктивна активність (РА)</td>
<td>R</td>
<td>-.192**</td>
<td>-.169**</td>
<td>-.257**</td>
<td>-.040</td>
<td></td>
</tr>
</tbody>
</table>

Note: R – Pearson’s test; p – reliability level of the Pearson’s test; VI – verbal intelligence; MI – mathematical intelligence; SI – spatial intelligence; APE – academic performance evaluation; * – significance level p≤.050 (in italics); ** – significance level p≤.010 and p<.001 (in bold).

Далі здійснено порівняння отриманих описових частотних характеристик із середніми нормами за шкалами методики діагностики особистісних факторів обдарованості, які запропонувала Н. Бельская (2019), і не з'явилося достовірних відмінностей. За “Тестом структури інтелекту” (Amtchauer et al., 2001) респонденти продемонстрували достатньо середні показники за всіма типами інтелекту, але статистично достовірних відмінностей не було зафіксовано. Порівняння описових частотних характеристик вибіркової сукупності казахських і болгарських студентів статистично достовірних відмінностей не показало, тому всі наступні статистичні аналізування зроблено на загальній вибірковій сукупності. Є підстави вважати, що вибіркова сукупність, яка обрана рандомно, знаходиться за своїми вимірами в межах рекомендованих середніх нормативів.

Далі за допомогою критерію К. Пірсона (R) з’ясовано кореляційні зв’язки між залежними й незалежними змінними та додатковою змінною. У табл. 2 подано кореляції дослідження академічної обдарованості майбутніх вчителів.

Констатовано, що всі особистісні фактори обдарованості респондентів мають статистично достовірні кореляційні зв’язки з досліджуваними параметрами. Загалом п’ятнадцять кореляційних зв’язків свідчать про високу
Research on Academic Giftedness of Future Teachers

in future teachers' academic giftedness. Such respondents are characterized by openness, curiosity, imagination, high cognitive activeness, aspiration to experimentation, the ability to go beyond standard situations, i.e. to think unconventionally. Expectedly, the parameters “creative dysfunctionality” and “reproductive activeness” have all inverse statistically significant correlations, since, obviously, reproductive activeness indicates conservativeness and unwillingness to change anything, experiment or act unconventionally. At the same time, we understand that the aspiration to develop an endles list of methodological recommendations, introduce a number of instructions, step-by-step algorithms and operationalize students’ education can have a considerable negative impact on “over-situational activeness” and can have a positive effect on “reproductive activeness”. At the same time, “creative dysfunctionality” is related to the problems of self-regulation in educational activity, that partly entails a problem of procrastination and has a considerable impact on making any decisions by future teachers. Creative dysfunctionality has the strongest negative correlations and is the most dangerous factor, affecting the respondents’ giftedness. The direct correlation of intuition with the researched parameters is obvious. Risk inclination has only two statistically significant correlations – with CI (R = .317; p < .001) and SI (R = .223; p < .001). The first hypothesis was confirmed, since personal factors of future teachers' academic giftedness have statistically significant correlations with the parameters of intelligence and academic performance evaluation.

Then, it was necessary to confirm/disprove the second hypothesis. Therefore, the researched groups were put according to their academic performance in Group 1 (a low level) and Group 2 (a high level) by the median (Me=3.00). Group 1 consisted of n=122 (47.29%) respondents and Group 2 – n=136 (52.71%). Tabl. 4 gives the results of comparison of personal factors of giftedness and the types of intelligence in Groups 1 and 2 by means of the Mann-Whitney U-test.

An advantage of Group 2 by the only parameter “over-situational activeness” was established
Discussion
The results obtained from the three universities allow stating that the descriptive frequency characteristics (see Tabl. 2) of the students are within the normative values of the average distribution. Since the average norms are established on a wide age range of the respondents during testing psychometric procedures, we can assume that the sample of students has average values by the scales. Academic performance evaluation has only one statistically significant correlation (see Tabl. 3) with the factors of future teachers’ academic giftedness – "OA" ($R=0.134; p<0.032$). There are no statistically significant differences in the obvious inverse correlations. The obtained correlations

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Mann-Whitney U-test</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over-situational activeness (OA)</td>
<td>6340.500</td>
<td>0.040</td>
</tr>
<tr>
<td>Creative dysfunctionality (CD)</td>
<td>7325.500</td>
<td>0.100</td>
</tr>
<tr>
<td>Intuition (I)</td>
<td>7625.500</td>
<td>0.251</td>
</tr>
<tr>
<td>Risk inclination (RI)</td>
<td>7514.000</td>
<td>0.181</td>
</tr>
<tr>
<td>Reproductive activeness (RA)</td>
<td>7567.000</td>
<td>0.216</td>
</tr>
<tr>
<td>Verbal intelligence (VI)</td>
<td>7818.000</td>
<td>0.422</td>
</tr>
<tr>
<td>Mathematical intelligence (MI)</td>
<td>7317.500</td>
<td>0.094</td>
</tr>
<tr>
<td>Spatial intelligence (SI)</td>
<td>7298.000</td>
<td>0.089</td>
</tr>
</tbody>
</table>

Note: U – the Mann-Whitney U-test; p – the level of significance by the Mann-Whitney U-test; * – the level of significance $p \leq 0.050$ and ** – the level of significance $p \leq 0.010$, the data is given in bold type.

Примітка: U – критерій Манна-Уітні; p – рівень достовірності критерію Манна-Уітні; * – рівень достовірності $p \leq 0.050$ і ** – рівень достовірності $p \leq 0.010$, дані подано жирним шрифтом.

(U=6340.000; p<0.40). Group 1 does not have an advantage over Group 2, even those parameters which demonstrated an inverse correlation do not give such an advantage. This allows stating that over-situational activeness is the only personal factor which determines the current academic giftedness of future teachers. This sole factor allows stating that the second hypothesis is confirmed, though the majority of the parameters do not have a statistically significant advantage.
alarm us and allow stating that the existing system of education which trains future teachers is very traditional, obviously, the corporate culture is oriented towards clear regulatory norms, instructions and rules. It is highly standardized and requires fulfilling them. Educational-professional training for future teachers is a complex process of the formation of competences which should be future-oriented and innovative. It is necessary that students should strive for changes, be ready for experimenting, i.e. for innovations. They should be agents of changes at their future workplace. Therefore, it is necessary to reduce pressure on a regulatory component, because education is usually overloaded by reproductive knowledge, i.e. reproductive activeness, which is routine and contradicts the development of over-situational activeness.

The research findings of R. Das (2023) testify to excessive use of theoretical work in education and, as a consequence, the formation of alienation from a future profession. A total theoretical component contradicts the formation of academic creativity. Reproductive activeness does not contribute to the development of personal creativity and academic giftedness. We can generalize that academic giftedness should be developed through methods and techniques of over-situational activeness. Comparative analysis (see Tabl. 4) allows considering over-situational activeness to be a backbone factor of future teachers’ academic giftedness. Therefore, educational programs, educational components, academic-methodological assistance, lectures and practical classes should be organized on the basis of developing students’ over-situational activeness. It is complex permanent work which requires reformatting educational materials and entails training and qualification upgrading of university teachers and implementation of permanent innovations. University teachers who educate future school teachers should initiate the formation of interest in education and achievement of high results for academic performance. Under such conditions, academic performance evaluation will have more regular correlations with the factors of respondents’ academic giftedness. At the same time, the process should not be uncontrolled.
Control in educational process should play a special role – ensure quality and maintain academic giftedness. This opinion is shared by a number of researcher in their studies (Kulz et al., 2023; Nosov et al., 2020; Zinchenko et al., 2020) related to our findings. Control should combine formal and content components of any process. The suggestion of G. Lauwers (2019) highlighting the necessity to constantly reform the educational process of future teachers is consistent with our study. His research findings in combination with our research results demonstrate basic conditions for improving the process of developing future teachers’ academic giftedness. We agree with J. Robbins et al. (2022), that university teachers’ theoretical approach without using interactive approaches to training future school teachers noticeably restricts their development of academic giftedness. At the same time, additional attention should be paid to studying future teachers’ aspiration to independently reveal the potential of personal academic giftedness. This problem is confirmed in the studies of N. Kushnirovich (2023), L. Linnenbrink-Garcia, S. Walton (2023). Researchers H.-T. Chang et al. (2022) demonstrated and substantiated on the example of Chinese students, that students’ academic giftedness can be developed through permanent experimentation, gaining professional knowledge via active development of technologies. In addition, in order to regulate similar problems in the process of education, it is recommended that universities should implement special personalized hybrid systems which allow each student to independently choose courses of their specialization. This system can consist of individual modules containing fundamental subjects, different formats of gaining knowledge and relevant characteristics of academic giftedness for individual types of students (Chang et al., 2022).

We agree with researchers I. Suarta et al. (2023), who found out that university teachers do not initiate and develop a creative approach on the part of students intentionally, making the process of gaining knowledge easier. Researcher M. Hilm (2023) showed that a lack of future teachers’ involvement in independent search of optimal educational methods actually does not affect deterioration in the indicators of high results due to academic giftedness. Academically successful students have more predictable correlations with factors of academic giftedness. At the same time, they do not form a basis for control. Control in the educational process should play a special role – ensure quality and maintain academic giftedness. This opinion is shared by a number of researcher in their studies (Kulz et al., 2023; Nosov et al., 2020; Zinchenko et al., 2020) related to our findings. Control should combine formal and content components of any process. The suggestion of G. Lauwers (2019) highlighting the necessity to constantly reform the educational process of future teachers is consistent with our study. His research findings in combination with our research results demonstrate basic conditions for improving the process of developing future teachers’ academic giftedness. We agree with J. Robbins et al. (2022), that university teachers’ theoretical approach without using interactive approaches to training future school teachers noticeably restricts their development of academic giftedness. At the same time, additional attention should be paid to studying future teachers’ aspiration to independently reveal the potential of personal academic giftedness. This problem is confirmed in the studies of N. Kushnirovich (2023), L. Linnenbrink-Garcia, S. Walton (2023). Researchers H.-T. Chang et al. (2022) demonstrated and substantiated on the example of Chinese students, that students’ academic giftedness can be developed through permanent experimentation, gaining professional knowledge via active development of technologies. In addition, in order to regulate similar problems in the process of education, it is recommended that universities should implement special personalized hybrid systems which allow each student to independently choose courses of their specialization. This system can consist of individual modules containing fundamental subjects, different formats of gaining knowledge and relevant characteristics of academic giftedness for individual types of students (Chang et al., 2022).

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of academic giftedness. We assume that, along with proprietary methods, it is important to use methods ensuring the formation of over-situational activeness, which is a main factor of the development of academic giftedness, as shown in the results of our research. Our studies (Vargas-Hernández et al., 2023a; 2023b) and the research of other authors (Lin et al., 2022; Popovych et al., 2023) persuasively demonstrated that education should be ready for social changes and permanently seek new methods and techniques which will have social value.

Conclusions
We performed analysis of the phenomenon of future teachers’ academic giftedness and defined academic giftedness as students’ ability to excellently master educational materials, do educational tasks on time, actively participate in a social life of their higher education institution, tolerate uncertainty and be agents of innovations.

Pearson’s correlation analysis \( (R) \) allowed establishing that all the personal factors of giftedness: over-situational activeness, creative dysfunctionality, intuition, risk inclination and reproductive activeness – have statistically significant correlations with the types of intelligence and academic performance evaluation. We registered fifteen correlations \( (p\leq.050; p\leq.010; p<.001) \), which testified to a high degree of interdependence between the researched parameters. It was found that the factor of giftedness “over-situational activeness” has the largest number of statistically significant correlations – four \( (p<.001; p<.050) \) and it was substantiated that this factor is the most important and the most dependent in future teachers’ academic giftedness. The Mann-Whitney U-test allowed establishing a statistically significant advantage of Group 2 (a high level of academic performance evaluation) by the parameter “over-situational activeness” \( (U=6340.000; p<.040) \) and explaining that the respondents’ over-situational activeness is a backbone factor of future teachers’ academic giftedness. We gave a number of recommendations concerning reorganization and implementation of innovative processes of training future teachers aimed at developing academic giftedness and providing gifted students with quality psychological-pedagogical support.
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