

The methodological basis for increasing the internal intellectual potential of physical education and sports students

Base metodológica para incrementar el potencial intelectual interno de los estudiantes de educación física y deporte

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Abstract. The intellectual potential of a person is closely related to the concept of intellectual capital as a component of human capital. This study aims to consider intellectual potential based on available psychometric methods and establish correlations between this potential and demographic and other easily observable factors. The study involved 128 students from universities and colleges of physical culture and sports located in Pavlodar (Republic of Kazakhstan). The study revealed a strong correlation between the level of academic achievement of the participants and the results of tests of general and implicit intellectual abilities (CCAT and IO4). Also, no significant correlations were found between the results of these tests and the factors of gender, age, and the year of study. A strong correlation was observed between the results of the two tests, which may indicate a close relationship between constantly used and hidden intellectual abilities. The research results can be used to improve the quality of training physical education teachers. The measurement and methodologically correct development of the intellectual potential of teachers multiplies the subsequent increase in human capital at the expense of their prospective students.

Keywords: cognitive abilities; cross-disciplinary learning; intellectual capital; intellectual development; physical education.

Abstracto. El potencial intelectual de una persona está íntimamente relacionado con el concepto de capital intelectual como componente del capital humano. Este estudio tiene como objetivo considerar el potencial intelectual basado en los métodos psicométricos disponibles, así como establecer correlaciones entre este potencial y la demografía y otros factores fácilmente observables. El estudio involucró a 128 estudiantes de universidades y colegios de cultura física y deportes ubicados en Pavlodar (República de Kazajstán). El estudio reveló una fuerte correlación entre el nivel de rendimiento académico de los participantes y los resultados de las pruebas de habilidades intelectuales generales e implícitas (CCAT e IO4). Asimismo, no se encontraron correlaciones significativas entre los resultados de estas pruebas y los factores de género, edad y año de estudio. Se observó una fuerte correlación entre los resultados de las dos pruebas, lo que puede indicar una estrecha relación entre las habilidades intelectuales constantemente utilizadas y las ocultas. Los resultados de la investigación pueden utilizarse para mejorar la calidad de la formación de los profesores de educación física. La medición y desarrollo metodológicamente correcto del potencial intelectual de los docentes multiplica el posterior incremento del capital humano en detrimento de sus futuros alumnos.

Palabras clave: habilidades cognitivas; aprendizaje interdisciplinario; capital intelectual; desarrollo intelectual; educación Física.

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Introduction

Intellectual development has been the major focus of interest of psychologists and education management specialists for many decades. At the same time, most researchers are concentrated on management (Bontis, 1998; Hamdan, 2018; Minică, 2020). The intellectual potential of an enterprise or firm is considered the most important factor ensuring sustainable development and prosperity in the information age (Ostrowska et al., 2020; Oncioiu, 2021). The issue of studying intellectual development in a pedagogical context is increasingly being considered in connection with the issues of inclusion and development of children with various forms of mental or physical limitations (Berthiaume, 2020). The topic of this article is relevant and significant in the field of research, as there is relatively limited research dedicated to the use and development of the intellectual potential of physical education and sports specialists. A certain positive role can be played by research in the field of technologization and algorithmization of pedagogical processes (Kuanysheva et al., 2019), which facilitate the massive implementation of the latest scientific inventions in the field of physical education and sports for schoolchildren and students. The purpose of this

study is to consider the methodological conditions for the development of the intellectual potential of these specialists to increase the effectiveness of their professional efforts.

The link between physical training and the development of the brain, intellectual capacity, and creativity has been noted in several studies (Afolabi & Balogun, 2017; Phytanza et al., 2018; Yue, 2020; Polevoy, 2021). A strong connection between health, physical abilities, and the provision of high-quality intellectual work and significant intellectual achievement is generally considered to be proven (Phytanza et al., 2018; Yue, 2020). Lack of exercise and diet negatively affects the ability to solve problems, the adequacy of decision-making, the choice of the best course of action, and the performance of complex intellectual tasks associated with abstract and verbal thinking (Polevoy, 2021). However, the connection between the intellectual potential of an individual, general intellectual abilities, and physical development has not been properly studied. This is partly because the study of intellectual capital, which intellectual potential is associated with according to scientific developments by scientists from the majority of developed countries, is closely related to economic and sociological theories rather than per-

sonality psychology (Kianto et al., 2020). This further affirms the importance and relevance of this study.

In Western science, the intellectual potential is traditionally considered in the context of human capital and its components (Bontis, 1998). This is primarily a social and group variable, which is viewed as a characteristic of a social stratum or social group rather than that of one person (Cuozzo et al., 2017; Ostrovska et al., 2020; Strykalenko et al., 2020). As a person's characteristic, intellectual potential is considered a set of cognitive capabilities and mental abilities that can be developed by a person under appropriate conditions (Sawleshwarkar et al., 2018). This definition makes the concept of intellectual potential in the interpretation of Russian scientists related to the concept of intellectual abilities; however, the concepts are not equalized.

One of the most important problems is the problem of assessing and measuring human capital and its related factors, intellectual capital, social capital, etc. (Córcoles & Vanderdonck, 2013; Goebel, 2019; Konno & Schillaci, 2021). The majority of approaches are based on the identification of intellectual capital as an economic factor, which can be measured by assessing the variability of economic indicators in the course of economic activity. Assessment options may range from increasing the profit of an enterprise when realizing the potential of intellectual capital to the new methods of intangible asset accounting, of which different types of human capital are of particular importance (Osinski et al., 2017; Goebel, 2019).

The economic assessment of human capital and intellectual potential is predominantly of a group nature and is carried out with the help of indirect methods. This means that the assessment takes place through the means of intellectual potential realization, for example, the probable profit or its assessment as an economic asset (Cuozzo et al., 2017; Hamdan, 2018; Kalenyuk & Tsymbal, 2021). This form of assessment makes it difficult to evaluate the intellectual potential of a person or to assess it in the field of pedagogy.

From the perspective of psychometric research, the intellectual potential is usually measured with the help of general intelligence tests. These tests are time-constrained and combine a method for determining the number of different components of intellectual development (spatial thinking, handling logical and mathematical categories, features of operative memory management, verbal thinking, and others). A common feature of this type of test is a great number of questions and a time limit. In most cases, general intelligence tests assess the level of intelligence of an individual required to complete secondary school (Sawleshwarkar et al., 2018). Several specialized industry intelligence tests focus on the possession of unique skills or personality traits of a very high level. Thus, several tests make it possible to identify individuals capable of a rapid or accurate assessment of a solution with the help of abstract thinking (Martínez-Plumed et al., 2017; Sawleshwarkar et al., 2018; Hovardas & Irakleous, 2020).

However, both types of tests cannot be used to determine the general intellectual potential of a person, as well as the hidden potential, which can be revealed through appropriate stimulation and reinforcement.

Implicit intellectual potential can be defined as the general intellectual capabilities of an individual in the form of abilities that can be developed, but are not realized as they do not receive external behavioral reinforcement in the form of activities related to these abilities and special efforts on the part of the individual (Martínez-Plumed et al., 2017; Berthiaume, 2020; Fortuin et al., 2020). At the same time, implicit intellectual potential can be determined and assessed by psychometric methods as it manifests itself as a certain psychological activity.

The development of implicit intellectual potential can be closely related to the development of interdisciplinary relationships during training. One of the most effective methods for achieving academic success is the use of interdisciplinary connections that stimulate different styles of thinking and the development of general intellectual abilities through the use of certain types of thinking (logical, spatial, abstract, rational thinking) when solving problems in different contexts. Researchers note the particular importance of interdisciplinary education in the context of training physical education and sports specialists.

Literature review

Both Western and Russian researchers consider intellectual potential as a set of accumulated and currently available opportunities for the use of talents, knowledge, skills, and social connections in professional activities (Bontis, 1998; Córcoles & Vanderdonck, 2013; Seitkazieva et al., 2018; Dumay et al., 2019). At the same time, intellectual potential is viewed as one of the basic components of the human capital of a company, a country, or a separate region (Kianto et al., 2020; Konno & Schillaci, 2021). Socialization of the individual is closely related to the manifestation of abilities and the acquisition of social status and social roles; generally, the need for status improvement and the need for socialization are important predictors of the development of intelligence and self-actualization. Personality development starts at a very early age and is strongly influenced by parenting strategies and early preschool and early school learning and socialization (Berthiaume, 2020). Therefore, intellectual potential cannot be considered outside of its social role.

One of the objectives of this study was to conduct a systematic review to examine the current state of research on the relationships between social factors of goal achievement theory and self-determination theory, basic psychological needs, and motivational norms on intellectual potential (Fernández-Espínola & Almagro, 2019). The results revealed that a task-oriented approach, satisfaction of basic psychological needs, and more self-determined types of motivation are positively associated with emotional intelligence. Conversely, external motivational regulation and amotivation are negatively correlated with

intellectual potential.

Another article focuses on one of the most studied aspects of physical education - the pedagogical model of cooperative learning and its influence on school-age students (Molina et al., 2021). The main objective of the research was to explore the perception of physical education teachers in primary education regarding the use of cooperative learning and its connection to emotional intelligence. The results affirm that teachers have a favorable attitude toward this pedagogical model. However, they all agree that attaining its benefits and significant outcomes requires considerable effort, hard work, and continuous monitoring.

Methods for measuring intellectual potential as a component of human capital rely on the economic micro-indicators of an individual enterprise taking into account the use of knowledge, skills, social connections, and other elements of human capital belonging to the company (Goebel, 2019). Different measurement styles can be used in this case; some of them approach intellectual resources as a type of asset (Kalenyuk & Tsymbal, 2021). This approach makes it possible to assess an individual enterprise or region primarily from the point of view of intangible asset accounting. In the context of modern post-information society and the transformation of the world economy under the influence of the Internet and the digital environment, it is intangible assets that are the most significant part of the company capital (Hovardas & Irakleous, 2020; Kalenyuk & Tsymbal, 2021). These intangible resources are decisive for the sustainable development and continuous presence of the company in the market, as well as for ensuring the competitiveness of enterprises, countries, and individual regions (Hamdan, 2018; Seitkazieva et al., 2018).

From the perspective of pedagogy, the above methods for assessing human capital can be applied in the context of assessing the future (unrealized) capital in the form of the acquired skills and knowledge of students. To date, no academic or empirical research based on this approach has been found, but there are a number of studies that suggest the possibility of such research in the future (Cuozzo et al., 2017). When studying the professional competencies of teachers, some researchers offer complex models for assessing unrealized professional potential based on a comparison of competencies, personal conditions, and the influence of the environment (Eferova, 2018).

Specialized tests for determining general intellectual abilities, which are most commonly used in the context of interviewing candidates for employment, are usually focused on determining the number of practical abilities. Among such abilities, the following are most often determined: the ability to quickly choose an optimal solution from a number of possible or proposed ones; the ability to learn new skills and implement new knowledge; critical thinking ability; a considerable capacity of operative memory and the ability to focus on and operate with a large amount of information; the ability to select and apply

various logical criteria to classify objects (Martínez-Plumed et al., 2017).

A relatively rare intellectual ability test type is a test aimed at a narrower segment of abilities, which identifies unique or high abilities in a certain type of mental activity (Farmer et al., 2020). They make it possible to select a small number of job seekers whose abilities already allow them to effectively perform the functions required. At the same time, according to many researchers, such tests are not suitable for determining abilities and implicit intellectual potential that can be developed to achieve the desired outcomes or results exceeding the required level (Sawleshwarkar et al., 2018; Farmer et al., 2020). Most companies use electronic testing tools with an automated assessment of results, but the evaluation of their effectiveness with the help of software quality models often indicates their imperfection (Gordieiev et al., 2014; Sawleshwarkar et al., 2018). This limiting factor is crucial when trying to apply psychometric methods in pedagogical practice to form an individual trajectory of learning or specialization of gifted students (Fortuin et al., 2020; Osadcha et al., 2020).

The methodology for the development of intellectual potential involves the use of tools and the creation of learning conditions that to the greatest possible extent contribute to the transition of implicit opportunities (abilities, talents) into explicit ones (realizable and daily used) (Sastre-Riba & Ortiz, 2018). In the field of physical education, the growth of intellectual potential is considered from the point of view of its increase among rising teachers and schoolchildren (Yue, 2020; Polevoy, 2021). These two sides of the process are closely related as the role of the physical education and sports teacher is especially important as an example and external reference for students (Heyder et al., 2020). An increase in intellectual potential in available research is associated with three critical factors. The first one is the influence of physical training on the development of spatial and abstract thinking, which, under certain additional conditions, can promote the development of intellectual abilities (Afolabi & Balogun, 2017; Phytanza et al., 2018; Polevoy, 2021). The second one is an interdisciplinary approach to personality development, which involves the use of the same or similar forms of intellectual activity in different disciplines stimulating the development of various components of intellectual capabilities (Yue, 2020). The third factor is a system of social support and motivation for the development of intellectual capabilities of physical education and sports specialists and overcoming limiting beliefs that their field of activity is not related to the use of intellectual efforts (Phytanza et al., 2018; Aydin, 2019).

In this area of academic research, there is a gap associated with the criteria for the assessment, definition, and measurement of implicit intellectual potential. The study is intended to partially eliminate this gap. Intellectual potential realization is crucial for improving the quality of training and increasing human capital in the region and the

country. The novelty of the approach described by the study lies in the use of existing psychometric methods to identify implicit intellectual potential and establish its correlations with demographic and other easily observable factors. This can make it possible to improve the quality of physical education and sports teacher training without any specialized research in this field. The practical significance of the research results lies in the fact that the identification, measurement, and methodologically adequate development of the intellectual potential of teachers greatly affects the subsequent increase in human capital at the expense of their future students.

Objectives

This study examines intellectual potential based on available psychometric methods and establishes correlations between this potential and demographic and other readily observable factors.

The goal of the article is to review the methodological conditions for developing the intellectual potential of these specialists, with the ultimate aim of enhancing the effectiveness of their professional efforts. Research questions: Do demographic factors such as gender, age, and years of education influence the intellectual abilities of students? How do self-assessment factors and cognitive abilities mutually influence each other?

Research tasks:

- 1) To identify the level of correlation between internal demographic factors and participants' intellectual abilities.
- 2) To determine the level of correlation between cognitive abilities and students' self-assessment.
- 3) To assess the participants' academic performance and their results in tests of general and implicit intellectual abilities.

Method and materials

Participants

The first-, second-, third-, and fourth-year students of the Physical Education and Sports Departments of the universities and colleges located in Pavlodar (the Republic of Kazakhstan) were invited to participate in the study. The participants were selected randomly from the lists of students of the respective departments and faculties. Personal consent was obtained from each participant to take part in the experiment. A total of 128 participants were involved. The demographic data on the sample are presented in Table 1. Taking into account the size of the sample which included all Physical Education and Sports students in the city, the margin of error does not exceed 2.13; accordingly, the sample can be considered statistically representative.

Table 1.
Demographic Features of the Sample (by the Year of Study and Gender)

1st year		2nd year		3ed year		4th year		5th year	
men	women	men	women	men	women	men	women	men	women
13	14	12	13	13	14	11	12	12	14

The participants were also distributed by age. The age of the participants ranged between 18 and 22 years. The distribution of age in the sample according to the study with the help of the Student's t-test at $p \leq 0.05$ corresponds to the normal binomial distribution. Similarly, the Student's t-test at $p \leq 0.05$ showed that the distribution of the average grades of all participants in Physical Education and Sports (on the 12-point scale) also correspond to the normal distribution. This makes it possible to adequately apply the Pearson correlation method to search for correlations.

Research Design

The Criteria Cognitive Aptitude Test (Criteria Cognitive Aptitude Test, n.d.) was used to investigate the general intellectual capabilities of the participants, which has been widely used since 2006 in more than 20 countries by many companies to test the general analytical and intellectual abilities and intellectual potential of candidates for filling various positions (Sawleshwarkar et al., 2018; Criteria Cognitive Aptitude Test, n.d.). This test contains 50 questions to be answered within 15 minutes. The time limit is strict and is a mandatory test condition. The total score of the participant is the number of questions correctly answered within the time given. The questions are not ranked in order of importance for the final determination of test results. The questions are divided into 3 categories: 1) questions that reveal the potential of spatial thinking; 2) questions related to mathematics and logic; 3) questions that reveal the verbal capabilities of the subject.

Within this study, CCAT is used to determine the way the general intelligence of the participants is represented on a daily basis and the extent it manifests itself. The test is devoted to the assessment of general intellectual abilities and integrates the assessment of language understanding and the ability to unfold abstract constructions of statements, as well as spatial thinking, which is important for people involved in sports. Thus, the content of the test is directly related to all the main forms of intellectual activity of rising professionals in the field of physical education and sports and at the same time affects a number of related disciplines. According to the researchers noted above, the development of these forms can stimulate general intellectual development in connection with physical training.

Modified Intellectual Output 4: Self-assessment questionnaire (Students' questionnaire) (IO4) (Hovardas & Irakleous, 2020) was in this study to identify implicit intellectual potential. The feasibility of the test for research purposes is determined by the fact that this questionnaire contains rather complex intellectual tasks that combine the need to understand logical verbal constructions and build them at a level that obviously exceeds the level of school education. Thus, test requirements significantly exceed the level of most widely used general intellectual development tests for which the threshold of school education requirements is the upper limit of question complexity.

Another important test feature is a detailed self-

assessment of intellectual aspirations and tendencies, which makes it possible to assess the level of intellectual needs and ambitions of the individual, and therefore, the main predictors of motivation for intellectual development. For example, the statement “I can learn to program” was transformed into “I can learn to do physical exercise.”

The test questions contain sections: “Identification of variables”, “Identification and setting of hypotheses”, “Operational definition”, “Designing investigations”, and “Graphs and their interpretation”. The sections contain questions with a set of options (4 options), of which only one is correct. The test score corresponds to the number of correct answers.

Self-assessment questions include 10 small sections, each of which contains from 6 to 11 statements rated on the 5-point Likert scale (1-5). All statements are logically interconnected and create a cumulative assessment potential about such psychological qualities as involvement in professional activities, interest in and motivation for development, increase in social contacts in the field of activity, participation in the development of colleagues and fellow practitioners, self-confidence, confidence in creativity, long-term stability of the development of interest in the field of activity and the potential of intellectual development related to it (starting from school), readiness to develop skills of the 21st century. This approach makes it possible to assess the integral quality of involvement in intellectual development in one's area of professional interest through the calculation of the total score. This section of the test contains 56 statements; thus, minimum and maximum scores are 56 and 280, respectively.

To eliminate the temptation of the subjects to increase their score, the assessment procedure instructions were not shared with them, and they were sure that each section was assessed separately.

All participants were simultaneously tested in several classrooms for the convenience of accommodating a big number of respondents. The procedure was monitored by us and some volunteers. The tests took place one after the other one day apart to give the participants a chance to rest. Before taking each test, the participants received detailed instructions and explanations to complete the test forms. The participant was allowed to take the test only after verifying their complete understanding of all aspects of the test tasks. All test forms were found to be properly filled in and were further processed.

Data analysis

The data obtained based on the two tests were compared with the help of the Pearson correlation method. The potential correlation between the results of both tests in the context of each student surveyed or separate demographic groups within the sample (by gender, age, year of study, and average grade in the major related to physical education and sports) was studied.

A correlation would indicate a relationship between a certain level of general intellectual development (implicit

or explicit) and certain factors reflected by demographic differences in the sample.

Statistical processing

SPSS Statistics 26.0 was used to process and analyze the results obtained in the course of the polls; Microsoft Excel 2019 was used for data visualization and presentation.

Ethical issues

All participants took part in the study with their informed consent and understanding of the research objectives; their anonymity was guaranteed. No personal data of the participants were collected, stored, analyzed, or used in the course of the study.

When obtaining and processing data of each research participant, unique randomly generated numbers were used. This made it impossible to identify various data with a particular research participant. The findings of the study could not in any way affect the academic performance or personal life of the participants.

Research limitation

The study is limited to one specialty and students of universities and colleges located in one city, which requires caution when applying the results of the study to a bigger sample. The method of analysis and tests, aimed at determining only general intellectual abilities rather than individual cognitive styles and the development of certain aspects of intelligence or thinking, are characterized by certain limitations. A more accurate study of the intellectual development factors predominantly in the context of physical development, as well as their connections is the task of further research.

Results

The distribution of the results of both tests in the sample of respondents (Figures 1 and 2) is close to the normal binomial distribution. Checking the accuracy for compliance with the expected normal distribution with the help of the Student's t-test at $p = .05$ in both cases showed that the distribution of the results of both tests corresponded to the normal distribution.

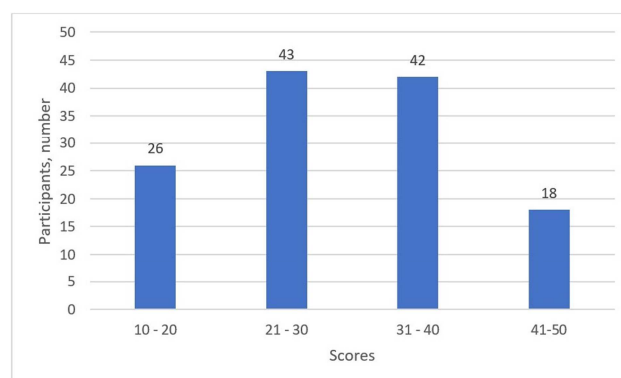


Figure 1. Distribution of Criteria Cognitive Aptitude Test (CCAT) Results.

The result obtained demonstrates that the ratio of general intellectual abilities, both explicit, daily manifested and used, and implicit, in the form of unused or rarely used intellectual abilities, within a random representative sample will generally correspond to the normal distribution in statistical groups.

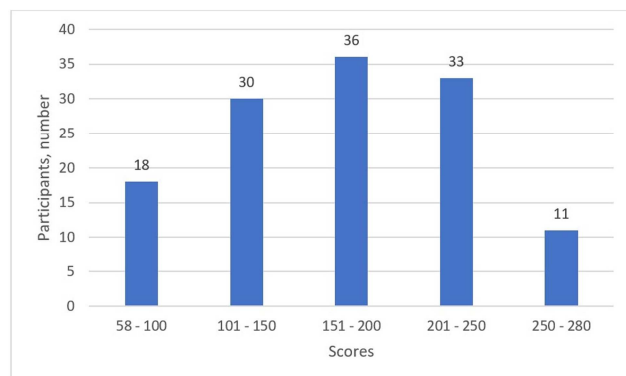


Figure 2. Distribution of Intellectual Output 4: Self-Assessment Questionnaire (Students' Questionnaire) (IO4).

The survey results show the expected distribution of intellectual potential in a representative sample provided that it is a fairly representative section of the community, within which there are no critical factors of influence (death of a part of the population as a result of wars or epidemics, demographic deformations, the influence of external factors on heredity, etc.) (Seitkazieva et al., 2018; Oncioiu, 2021).

Further verification of the results with the help of Pearson's correlation coefficient was intended to reveal the presence of statistically significant relationships between different demographic characteristics in the group of study participants, as well as between the results of the two tests used in the experiment. The results of the correlation study are presented in Table 2.

Table 2. Correlations between the Demographic Factors of the Sample and the Results of the IO4 and CCA Tests

	age	gender	year	score	r
IO4	.128	.562	.206	.811*	
CCAT	.501	.501	.409	.783*	.851*

Correlations recognized as statistically significant and strong

As can be seen from Table 2, no strong statistically significant correlations were found between the internal demographic factors of the representative sample of participants and the results of general intelligence tests. The only exception is the presence of a strong correlation between the results of both tests and the academic success of participants in their majors (subjects related to physical education and sports). In the context of the Criteria Cognitive Aptitude Test and the IO4 test, the correlation is $r = .783$ and $r = .811$, respectively. This demonstrates that there is a close connection between the intellectual potential of both types (realized and latent) and the academic success the student has achieved. The intellectual potential

may not be completely isolated or unrealizable, and it can be manifested during active learning under the influence of pedagogical incentives and motivation for further achievements and self-realization.

There is also a strong correlation between the results of both tests ($r = .851$). The interpretation of this result is not completely ambiguous. On the one hand, it may indicate that implicit intellectual abilities are closely related to general intellectual abilities and are aspects of the same phenomenon. On the other hand, this may indicate the similarity of the content of the tests used. However, the second explanation cannot be unambiguously accepted as the comparison of the mean indicators of the results of both tests in the context of the same group when testing the null hypothesis about their equivalence using the Student's t-test indicates the presence of statistically significant differences in the results obtained at the level of significance $p = .05$.

It should be noted that the intellectual potential of both types highly correlates with the gender factor ($r = .562$ and $.501$ in the IO4 test and CCAT, respectively). In this case, the indicators of women were much higher than those of men, which was demonstrated by the correlation ratio. In general, this result cannot be considered truly statistically significant in the context of a relatively small group and requires further verification.

Discussion

The results obtained indicate the presence of a strong connection between the academic achievements of rising physical education and sports professionals in their areas of expertise and their level of intellectual capabilities. Researchers have obtained similar results in various professional fields (Shipunova et al., 2018; Kianto et al., 2020; Pesta et al., 2020). These results demonstrate a possible pattern of intellectual potential manifestation. The potential cannot be exclusively latent – it inevitably manifests itself in the process of intellectual activity; its manifestation and formation are more pronounced in the presence of additional incentives or social support (Ostrovskaya et al., 2020; Strykalenko et al., 2020). According to some researchers, the stimulation of intellectual potential may not be associated with the use of special courses or social incentives but with the intensity of the digital environment and the contacts it forms (Shipunova et al., 2018). Access to information, communication with those who are engaged in a similar type of activity, or qualification improvement can encourage a person to change their professional orientation in case of the identification of the sphere of predominant manifestations of their intellectual potential (Minică, 2020).

The universality of intellectual capital for the formation of competencies of various types remains an important issue to be discussed. On the one hand, the presence of intellectual potential demonstrates an increase in academic achievement in several interdisciplinary fields

during studies (Yue, 2020). This may indicate that intellectual potential in terms of cognitive capabilities can be considered a universal basis for the development of any type of competence. On the other hand, there are empirically proven differences between competencies that are of an emotional or social nature and those that are intellectual (Afolabi & Balogun, 2017). This difference is realized through the concept of social or emotional intelligence (Bucich & MacCann, 2019), which is not identical to the concept of general intellectual capabilities. Thus, in the context of poor intellectual abilities, psychometry and observation of a person's behavior demonstrate powerful emotional intelligence and the ability to create social networks and sustainable effective social connections (Afolabi & Balogun, 2017). A very important point is that the relative success in life, which can change when achieving a certain level of well-being, does not seem to be related to the intellectual level: individuals with intellectual abilities and developed emotional intelligence can demonstrate equal achievements (Bucich & MacCann, 2019).

The correlation between realized and implicit intellectual potential found in this study seems to be rather weak. Several studies also indicate that intellectual capital may have a latent form and the abilities of a person may not be identified, developed, and transformed into capital, that is, they will not be used to achieve economic and social goals (Roos, 2017; Pedro et al., 2020; Oncioiu, 2021). Nevertheless, the connection and possibly even the unity of intellectual capabilities and the conventionality of their division into explicit and implicit abilities, as well as realized and unrealized ones, is confirmed (Secundo et al., 2018b; Pesta et al., 2020). Empirical studies demonstrate that people who do not have neurological impairment can develop intellectual capabilities to a great extent (Stuart-Hamilton, 2017). The issue of the presence of natural limitations of intellectual capabilities at the physiological and anatomical level from the point of view of most research we have considered remains open (Jaxon et al., 2019; Heyder et al., 2020). This explains the critical role of the identification of intellectual capabilities to reveal intellectual potential and transform it into actual intellectual capital.

The potential of the intellectual development of physical education and sports specialists is closely related to the encouragement of their potential students to develop their intellectual potential through physical exercises (Phytanza et al., 2018; Polevoy, 2021). The development of intelligence forms an attractive personality for teachers and enables them to implement more modern technological and complex teaching approaches and tools, as well as to form individual learning trajectories for students with different life goals and needs (Aydin, 2019). The use of interdisciplinary learning opportunities can also create an excellent basis for the relationship between physical education professionals in their area of expertise, increase the quality of their employment, as well as improve the quality of their interaction with students if these professionals

become teachers (Córcoles & Vanderdonck, 2013; Secundo et al., 2018a; Aydin, 2019).

The absence of significant correlations between most demographic factors and the level of intellectual development and implicit intellectual potential can be considered expected. Some researchers note the absence of such correlations between gender factors or the absence of age restrictions in the field of the development of intellectual capabilities (Stuart-Hamilton, 2017; Bian et al., 2018; Jaxon et al., 2019). Studies involving large samples and conducted in various countries also do not indicate the influence of racial or ethnic factors on the distribution of general intellectual abilities (Liu, 2017; Pesta et al., 2020; Konno & Schillaci, 2021).

It is noteworthy that there are no significant differences in the results of tests assessing the general intellectual capabilities of students of different years of study, which indicates that the process of professional training at the university is not a significant factor to reveal implicit intellectual potential without the use of specialized tools. These tools can be social incentives (prizes, awards, contests, etc.); competition in the context of an employment or continuation of work in the field of academic science after graduation; the use of special courses or teaching methods aimed at developing intellectual abilities; the use of e-learning courses or training along with the standard university curriculum (Roos, 2017). Emotional intelligence in athletes is associated with their sports performance and, in turn, is disrupted when athletes experience negative emotions (e.g., anxiety) that are not properly regulated (Sánchez et al., 2021).

Conclusion

The study is devoted to the relationship between the intellectual potential of a person and intellectual capital as a component of human capital. Human capital is a defining concept for assessing the sustainable economic development of firms, regions, and countries. In this regard, the methodology for the development of the intellectual potential of a person as a component of increasing the intellectual capital of society is acquiring great importance. The purpose of the study is to apply proven methods of psychometric research to determine and measure implicit intellectual potential and to search for its possible correlations with a number of easily observable factors. Determination of such correlations will help to reveal the intellectual potential of physical education and sports professionals in the process of their training. The study involved 128 students with 1-4 years of study from the universities and colleges of physical culture and sports located in Pavlodar (Republic of Kazakhstan). The study sample was formed randomly among universities and colleges that train physical education and sports professionals. The results of the study showed a strong correlation between the level of academic achievement of the participants and the results of tests assessing general and implicit intellectual abilities

(CCAT and IO4). To determine the correlations, the Pearson correlation coefficient method was used. To establish the homogeneity of the samples and ensure the independence of the results of two closely related tests, the Student's t-test was used. Also, significant correlations were found between the results of these tests and the factors of gender, age, and the year of study. A strong correlation between the results of the tests indicating a connection between constantly used and implicit intellectual abilities was found. The practical significance of the research results lies in their use to change the quality of training physical education and sports teachers using determining implicit intellectual potential.

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