

Physical Education of Different Groups

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PECULIARITY AND INDICATORS OF STUDENTS ATTENTION TO INSTITUTE OF INFORMATION TECHNOLOGIES

Andrii Andres¹

¹Lviv Polytechnic National University, Lviv, Ukraine, andres-a@ukr.net

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Abstracts

Andrii Andres. *Relevance of Research Topic.* The high level of development of psychophysical qualities of a specialist promotes high efficiency and good health, professional success. The positive influence of the use of games in the physical education of students on their psychophysical indicators is proved. The existence of the relationship between individual indicators of psychophysical and physical preparedness is proved. However, the lack of information on the degree of interconnection between the level of development of agility and the indicators of attention in the students of the specialty «information technology» inhibit the process of finding effective means of physical education students of computer specialties, although the concentration and stability of attention are professional-significant psychophysical qualities of students of information and logic groups of specialties. The aim of the work was to find out the possibilities of improving the indicators of concentration, stability and switching the attention of the students of the Institute of Information Technologies to the development of agility. **Methods.** The experiment was attended by 548 male students of the first year of the Institute of Computer Technologies, Automation and Metrology. Attention was determined using Bourdon's corrective test. The agility was determined by the result of a shuttle run of 4 × 9 m. A correlation analysis was conducted. **Results of Work.** Only a small number (5,1 %) of students showed a very high concentration of attention. One third of students had high and very high (36,7 and 3,5 %) levels of sustainability. According to concentration and sustainability indicators, 16,1 and 21,3 % of students need urgent correction because they have low and very low rates; and by indicators of switching the attention of such students is significantly higher (28,2 %). Dexterity has a higher than average impact on the indicators of switching attention. **Conclusions.** Students of the Institute of Information Technologies require focused development of attention within the framework of psychophysical training during academic or extra-curricular physical education classes. Effective ones can be tools for developing agility.

Key words: psychophysical training, professional-applied physical training, physical education.

Андрій Андре́с. Спритність та показники уваги студентів інституту інформаційних технологій. Актуальність теми дослідження. Високий рівень розвитку психофізичних якостей фахівця сприяє високій працездатності й міцному здоров'ю, професійному успіху. Доведено позитивний вплив застосування ігор у фізичному вихованні студентів на їхні психофізичні показники. Доведено існування взаємозв'язку між окремими показниками психофізичної та фізичної підготовленості. Проте відсутність інформації про ступінь взаємозв'язків між рівнем розвитку спритності та показниками уваги в студентів спеціальності «Інформаційні технології» гальмують процес добору ефективних засобів фізичного виховання студентів комп'ютерних спеціальностей, хоча концентрація й стійкість уваги є професійно-значущими психофізичними якостями студентів інформаційно-логічної групи спеціальностей. **Метою** роботи було з'ясувати можливості покращення показників концентрації, стійкості та переключення уваги студентів Інституту інформаційних технологій засобами з розвитку спритності. **Методи.** У констатувальному експерименті взяли участь 548 студентів чоловічої статі першого курсу Інституту комп'ютерних технологій, автоматики та метрології. Увагу визначали із застосуванням коректурної проби Бур-дона, спритність – за результатом човникового бігу 4×9 м. Проводили кореляційний аналіз. **Результати роботи.** Лише невелика кількість (5,1 %) студентів продемонструвала дуже високий рівень концентрації уваги. Третина студентів мали високий і дуже високий (36,7 та 3,5 %) рівні

стійкості уваги. За показниками концентрації та стійкості уваги 16,1 і 21,3 % студентів потребують нагальної корекції, позаяк мають низькі й дуже низькі показники; за показниками переключення уваги таких студентів суттєво більше (28,2 %). Спритність має вищий від середнього ступінь впливу на показники переключення уваги. **Висновки.** Студенти Інституту інформаційних технологій потребують цілеспрямованого розвитку уваги в рамках психофізичної підготовки під час академічних чи позанавчальних занять із фізичного виховання. Ефективними для цього можуть бути засоби з розвитку спритності.

Ключові слова: психофізична підготовка, професійно-прикладна фізична підготовка, фізичне виховання.

Андрей Андрес. Ловкость и показатели внимания студентов Института информационных технологий. Актуальность темы исследования. Высокий уровень развития психофизических качеств специалиста способствует высокой работоспособности и крепкому здоровью, профессиональному успеху. Доказывается положительное влияние применения игр в физическом воспитании студентов на их психофизические показатели, существование взаимосвязи между отдельными показателями психофизической и физической подготовленности. Однако отсутствие информации о степени взаимосвязей между уровнем развития ловкости и показателями внимания у студентов специальности «Информационные технологии» тормозят процесс отбора эффективных средств физического воспитания студентов компьютерных специальностей, хотя концентрация и устойчивость внимания являются профессионально-значимыми психофизическими качествами студентов информационно-логической группы специальностей. **Цель** работы – выяснить возможности улучшения показателей концентрации, устойчивости и переключения внимания студентов института информационных технологий средствами по развитию ловкости. **Методы.** В эксперименте приняли участие 548 студентов мужского пола первого курса института компьютерных технологий, автоматки и метрологии. Внимание определяли с применением корректурной пробы Бурдона. Ловкость определяли по результатам челночного бега 4 × 9 м. Проводили корреляционный анализ. **Результаты работы.** Лишь небольшое количество (5,1 %) студентов продемонстрировала очень высокий уровень концентрации внимания. Треть студентов имели высокий и очень высокий (36,7 и 3,5 %) уровни устойчивости внимания. По показателям концентрации и устойчивости внимания 16,1 и 21,3 % студентов нуждаются в неотложной коррекции, поскольку имеют низкие и очень низкие показатели; по показателям переключения внимания таких студентов существенно больше (28,2 %). Ловкость имеет выше средней степени влияния на показатели переключения внимания. **Выводы.** Студенты института информационных технологий требуют целенаправленного развития внимания в рамках психофизической подготовки во время академических или внеучебных занятий по физическому воспитанию. Эффективными для этого могут быть средства по развитию ловкости.

Ключевые слова: психофизическая подготовка, профессионально-прикладная физическая подготовка, физическое воспитание.

Introduction. Psychophysical training is considered to be an important part of professionally applied physical training, whereas psychophysical abilities are the main components of professionally important features for specialists in different spheres. The high level peculiar to human psychophysical features development provides preservation of their working capacity and health. That is why the viability to enhance psychophysical qualification among students who master any extreme occupation (rescuers, law enforcement officers, liaison officers) is obvious [1; 2; 7; 13;]. The level of psychophysical features development among students who master any nondefense occupation (railroad men, land surveyors, specialists in energetics and datalogical spheres) [8; 9; 12;] also requires serious improvement.

Physical education and sport contribute greatly to the development of features that provide successful professional activities. The whole set of physical education exercises promotes the increase of psychophysical parameters. Still, the activities to improve agility have the most positive result for psychophysical features development [8]. Using games in students' physical education has a remarkably positive impact on their psychophysical features [5; 10; 11; 14]. Consequently, compiling programmes of physical activity geared at developing agility is treated as a perspective trend in professionally applied physical training in order to improve students' health and indices of professional readiness. This process is significantly inhibited by the lack of information concerning the real levels of psychophysical indices among students in computer specialities. The issues referring to the degree of interdependence between the level of agility and the indicators of concentration, stability and attention switching among the students of the Institute of Information Technologies remain unsolved despite the fact that attentiveness has been proved to be a professionally significant quality for employees in the datalogic sphere.

The **aim** of the present research is to find out the conditions to improve the levels of concentration, stability and attention switching among the students of the Institute of Information Technologies with the help of the tools to promote agility.

Objectives of the research:

- to find out the conditions to improve psychophysical indicators by means of physical education;
- to record the level of switching, concentration and stability of attention;
- to define the level of interdependence between attention and the level of agility among students.

Material and Methods of Research. 548 male first-year-students of Lviv Polytechnic National University participated in the ascertaining experiment. The students who took part in the experiment studied at the Institute of Computer Technologies, Automation and Metrology, mastering degrees in the fields of Computer Science, Computer Engineering, and Cybernetics. The age of the participants in the study was 17–18. All participants gave informed consent to take part in the experiment. Such parameters concerning attention as concentration, stability and switching were determined by Bourdon's corrective test. Agility was fixed by the results of a shuttle run. The Pearson correlation coefficient was estimated on the basis of the arithmetical mean referring to attention and agility.

Results. The analysis of the concentration has revealed the average levels of attention in most students (scheme 1). The average level of attention concentration was typical for 40,1%, 37,7% can be characterized as a high level. (Very) Low ability to maintain focus on the object, in case some obstacles occurred, was found out in 16,2% students. Only a small number of students (5,1%) showed a very high level of attention.

The level commenting on the stability of attention was also mostly average – 38,5%. One third of students can demonstrate high and very high (36,7% and 3,5%) levels of attention stability. However, every fifth student (21,3%) had a low level of ability not to distract from the mental activity and to maintain focus on the object of attention, therefore, they require to improve their indices of attention.

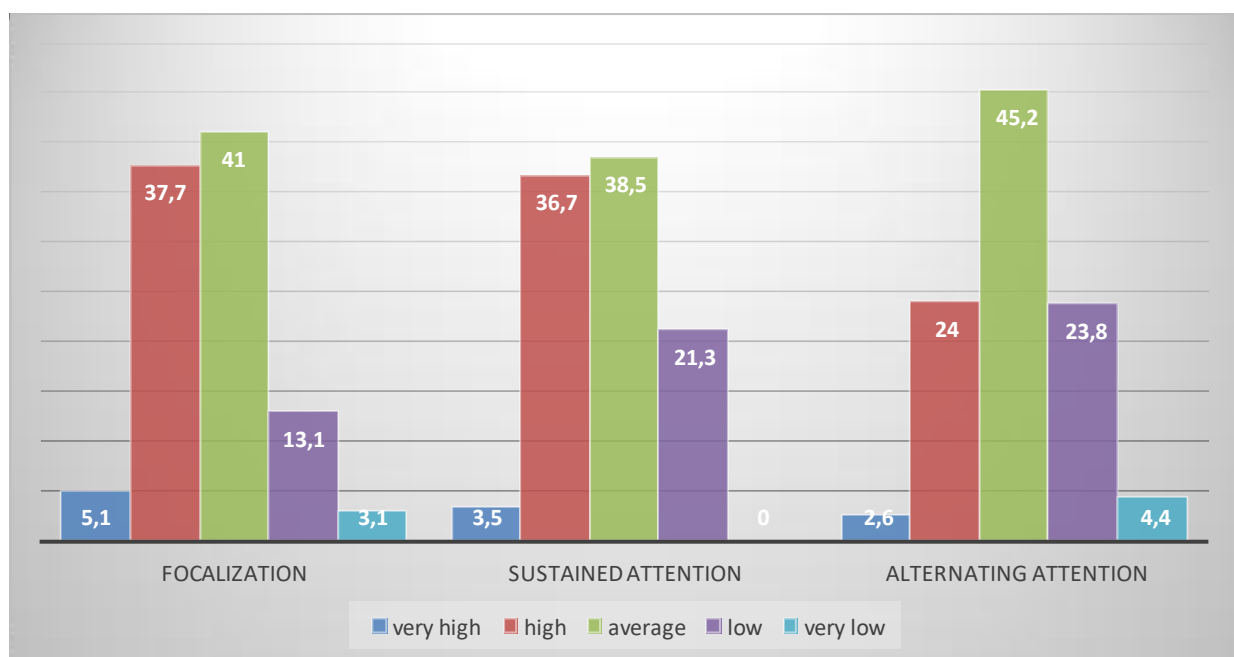


Figure 1. A Number of Students with Different Levels of Attention

The analysis of attention switching revealed average results. A small number of students (2,6 %) managed to pass the test successfully. A high level of attention switching was found in 24,0 % students. Every second student got «satisfactory» (45,2 %). A small number of students showed low indices (23,8 %) or failed (4,4 %) the test. Thus, every third of the first-year students at the University of Information Technology (28,2 %) has either a low or very low level of attention switching.

Scheme 1 shows that the ratio of students with different degrees of concentration and the ratio of students with stability of attention are similar to each other. The largest number of students can show average (41,0 % and 38,5 % respectively) or high (37,7 % and 36,7 %) levels, while the number of students with a low level of these parameters can be defined as significantly low (13,1 % and 12,7 % respectively). However, the ratio of students with different levels of attention selectivity differs greatly from two previous parameters. The index of attention switching (by 13,7 % and 12,7 % respectively) gets behind the

concentration and stability levels as far as the group of high level students is concerned. On average, some students (19%) need urgent correction of attention concentration and stability while their indices are low and very low. Still, due to the indices of attention switching the percentage of students increases (28, 2%). This indicates that one third of the students need to promote the level of attention switching.

The level of students' agility at the Institute of Information Technology was mostly lower than average and low ($10,4 \pm 1,2$ s). The ratio of students with different levels of agility is presented in Scheme 2.

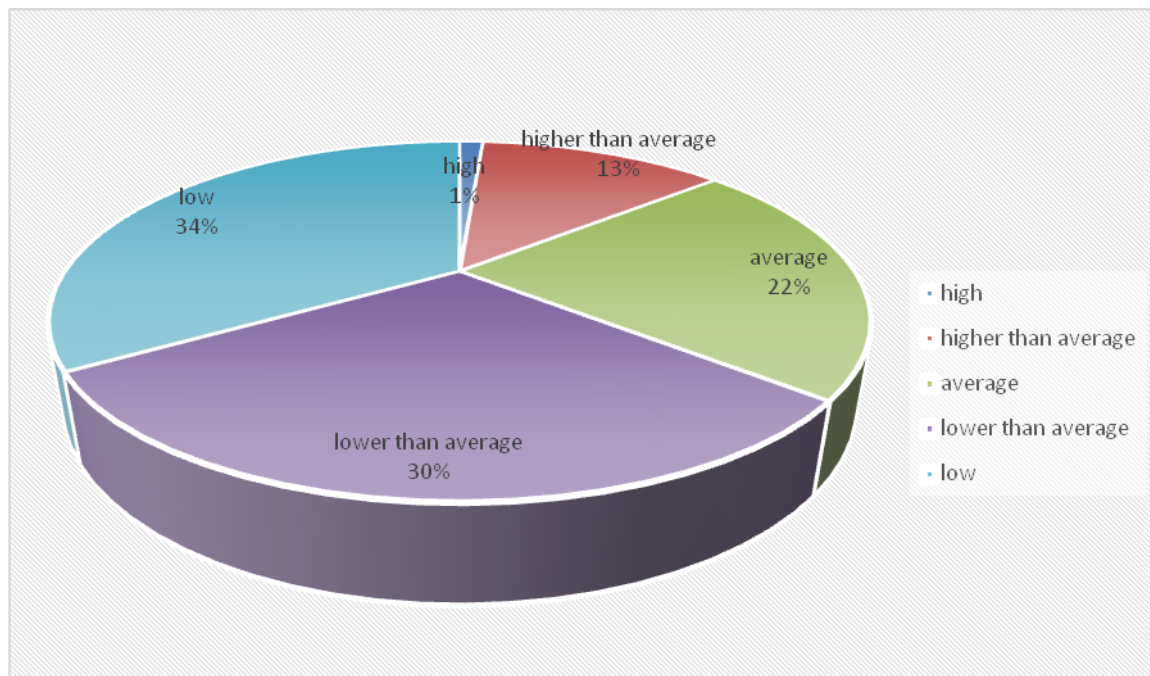


Figure 2. The Ratio of Students of the Institute of Information Technology with Different Levels of Agility

The results of the correlation analysis have confirmed that there is a reliable relationship between the indicators of attention (concentration $r_1=0,52$, stability $r_2=0,56$ and attention switching $r_3= 0,76$) and the level of agility. This suggests that the use of methods to improve agility will help promote students' attention. But the closest interaction – above average – has been found out between agility and attention switching.

Discussion. The progress of any professional activity in the sphere of information technology depends on a number of qualities: a high level of mental performance, endurance in case of prolonged, intense physical and mental pressure, the ability to maintain the focus and performance working under difficult conditions; high levels of stress resistance and self-control over emotions and behavior, self-control, the ability to restrain impulsive reactions that spontaneously arise; developed adaptive parameters of the nervous system (strength, balance, mobility, activity, dynamics of the nervous processes); logical thinking: depth, efficiency, latitude, autonomy, productivity, flexibility, criticality, predictability, dynamic thinking; the ability to analyze the situation; advanced imagination, observation, insight, intuition; a proper level of memory development, capacious memory, the ability to quickly update all necessary information; ability to focus, large volume and high concentration of attention, rapid attention distribution and switching from one object to another; the ability to learn new issues (Ostapenko). Thus, attentiveness is considered to be a professionally important quality for the future workers of IT-industry.

The analysis of the data obtained during the research of concentration and attention stability has found out that these parameters are not sufficiently developed among the students. The results with a score of 1 to 4 points (9-point scales) were shown by 75%. The levels of 7 and 8 points were performed by only 5%. And there is no result fixed at the level of 9 points. Female participants have significantly better scores; still, they are not sufficient taking into account their extreme professional importance [9]. To sum up, the results of our research have revealed that the levels of concentration, stability and attention switching are average among the students of information technology faculties. Further improvements for promoting control and attention among students are required. Having defined the levels of attention switching, we complimented the data [9] concerning the students in the railway sphere. The results of our students were higher than those of female

students of economic faculties, whose memory speed, mental processes and cognitive operations were recorded at the level below the average [10].

Psychophysical indicators and other characteristics have revealed close interconnection. It confirms the possibility of playing sports (futsal and handball) to improve the psychophysiological characteristics of students. It is proved [4] that bodyflex and pilates classes contribute to improvement of psychophysiological capacity. It is outlined that doing agility exercises facilitates an effective physical preparation of students mastering a wide range of modern occupations. Moreover, the right selection of professionally-applied exercises, comprising those designed to enhance agility, has a positive effect on the development of psychophysiological parameters among students belonging to datalogical sphere [8].

The practical methods to develop agility are based on motor exercises in complicated conditions. These are achieved by doing exercises while experiencing deficiency of space and time, possessing insufficient or excessive amount of information. Running across harsh terrain while overcoming natural barriers, skiing, practising ball-throwing and jumping, martial arts, gymnastic and acrobatic exercises, playing sports (especially on reduced playgrounds and with the increase in the number of players) are believed to be effective. Oftentimes, to deal with the problem of students' psychophysical readiness for future work, classes focusing on playing motor games are applied. There are studies [10; 11] that have proved that playing such games as handball, volleyball and futsal helps to develop a set of psychophysical qualities in students.

The accuracy of the relationships between the levels of agility and attention has expanded the data presented in the special literature. The data describe how the means of developing agility can influence the levels of attention. We have found out that agility possesses higher than the average level of influence on attention switching ($r_3 = 0,76$). This suggests that the improvement of agility is likely to cause some improvement of students' attention. The parameters of concentration and attention stability are professionally significant psychophysical qualities among students of the datalogic sphere, therefore, the development of activity sets for physical education among students, comprising techniques aimed at the development of agility, is a challenging trend to improve the levels of professional readiness and health.

Agility is a complicated and complex physical parameter of a person. Various types of agility are distinguished and consequently different methods should be used to promote such kinds of agility as the ability to control spatial, spatial and temporal, dynamic parameters of movements; the ability to maintain a stable equilibrium; the ability to feel and absorb the rhythm; the ability to relax the muscles, the ability to coordinate movements in motor action, and the coordination of movements. Although the game is a universal means to develop various manifestations of agility as a whole, it cannot be applied to all of them.

The programmes used by specialists are often not sufficiently detailed that can complicate the possibility of their application. Various psychophysical indicators have been studied, and their huge amount makes it impossible to generalize.

Thus, further studies are required in order to develop methodological approaches for enhancing agility in the structure of psychophysical readiness among future IT specialists.

To improve attention, it is possible to enlist the help of relays, barriers, elements of sports games, dance combinations with musical accompaniment that require simultaneous asymmetric movements of different parts of the body [7].

Further studies should be devoted to clarify the issue of the most efficient methods to develop agility that can contribute to the professional-applied physical training among the students of the Institute of Information Technologies.

Conclusions.

Psychophysical abilities are treated as the main components of the professionally significant qualities among future specialists in different spheres. It has been proved that effective psychophysical training, especially agility exercises, can contribute to the students' professional work in any modern sphere. To improve students' psychophysical readiness for future work, some programmes that mainly comprise movable sport games are often applied.

Students of the Institute of Information Technology have an average level of professionally meaningful levels concerning attention switching, concentration and attention span. However, on average every fifth student (16,1 % and 21,3 %) requires an urgent correction of attention as they have really poor performance referring to concentration and attention span. Every third student needs to improve the level of attention switching (28,2 %).

Agility possesses higher than the medium degree influence on the indicators of attention switching ($r=0,76$). Agility exercises can be an effective means for students' psychophysical training in the sphere of IT.

Thus, students' attention should be purposefully developed and such training should be conducted at physical education classes or extracurricular sessions. Agility exercises can be considered to be especially effective.

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