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DEVELOPMENT OF ART-STUDENTS' POSITIVE ATTITUDES TOWARDS PHYSICAL EDUCATION BY MEANS OF UNIVERSAL DESIGN

Gonchar O., Danylenko V., Kryvuts S., Zhernoklova G. Development of Art-Students' Positive Attitudes Towards Physical Education by Means of Universal Design

Purpose*: to determine whether art-students' attitudes to physical training can be changed into strongly positive ones by implementation UDL principals.*

Material: *it was examined students of the higher art institution (n=90) of 18–21-year-olds, who are the 1st-2nd-3d – year students (Kharkiv region, Ukraine). It was performed the attitude questionnaires for the Art-Students (Participation Motivation Questionnaire particularly intended for the young, whose motivation is very diverse, and Chi-square test analysis (X 2).*

Results: *in the group of the motivated students attending PE classes under conditions of the newly developed curriculum and newly designed the environment of sports space there is an obvious tendency to the strong positive attitudes to physical education (21 persons, that is 70 %). An indifferent attitude correlated to PE attendance of middle frequency was considerably reduced (16 persons, 53.3 %) of the motivated students' group versus 6 students (20 %) of the "motivated + UDL conditions" group. The results are proved with the chi-square statistic that is 35.2229. (p < .05).*

Conclusions: *the results allow correcting physical training classes of the art-students. The art-students' positive attitudes towards to sport activities may be developed by using of universal design principles that can be applied to all aspects of physical education organization. Such PE classes (Fitness programmes) should focus on the differentiated individual motivations aiming both to reduce professional health risks and to treat disabilities by physical exercises. The universal design principals implementation allows creating curriculum, teaching techniques, equipment, and interior design of the gym to meet the peculiar needs of the arts students.*

Keywords: *attitudes, art academy, physical training, universal design for learning, students, motivation.*

Гончар О. В., Даниленко В. Я., Кривуц С. В., Жернокльова Г. О. Формування позитивного ставлення до занять фізичною культурою в студентів закладів вищої митецької освіти засобами універсального дизайну

Мета *статті полягає у визначенні можливостей змінити на позитивне ставлення студентів вищих мистецьких навчальних закладів до занять фізичною культурою шляхом реалізації принципів UDL.*

Матеріал: *в експерименті взяли участь студенти 1–3 років навчання закладу вищої освіти мистецького напряму в кількості 90 осіб, вікова категорія яких становить 18–21 років (Харківська область, Україна).*

Результати: *реалізація детально розробленої навчальної програми занять фізичною культурою, які відбуваються в умовах спеціально розробленого предметно-просторового середовища спортивного приміщення, зумовила очевидну тенденцію до формування стійкого позитивного ставлення студентів.*

Висновки: *отримані результати проведеного експерименту підтверджують можливість формування позитивного ставлення студентів мистецтвознавчого профілю до занять фізичною культурою з урахуванням принципів універсального дизайну, які можна застосувати у всіх аспектах організації занять фізичною культурою. Такі заняття з фізичного виховання (фітнес-програми) мають бути зосереджені на диференційованому підході до мотивації особистостей, що мають на меті зниження професійно зумовлених ризиків для здоров'я та спрямовані на корегування зазначених порушень фізичними вправами. Для задоволення особливих потреб студентів мистецького профілю застосування принципів універсального дизайну передбачає розробку спеціальних академічних програм, методик навчання, спеціалізованого обладнання та формування дизайну предметно-просторового середовища спортзали.*

Ключові слова: *позитивне ставлення, мистецьке спрямування, фізична підготовка, універсальний дизайн для навчання, студенти, мотивація.*

Гончар Е. В., Даниленко В. Я., Кривуц С. В., Жерноклёва Г. А. Формирование позитивного отношения к занятиям физической культурой у студентов университетов искусств средствами универсального дизайна

Цель статьи *заключается в определении возможности изменить на положительное отношение*

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студентов высших художественных учебных заведений к занятиям физической культурой путём реализации принципов UDL.

Материал: *в эксперименте приняли участие студенты 1–3 курсов высшего учебного заведения художественного профиля в количестве 90 человек, возрастная категория которых составляет 18–21 год (Харьковская область, Украина).*

Результаты: *реализация детально разработанной учебной программы занятий физической культурой, проводившихся в условиях специально разработанной предметно-пространственной среды спортивного помещения, обусловила очевидную тенденцию к формированию устойчивого положительного отношения студентов.*

Выводы: *полученные результаты проведенного эксперимента подтверждают возможность формирования положительного отношения студентов художественного профиля к занятиям физической культурой с учётом принципов универсального дизайна, применимых во всех аспектах организации занятий физической культурой. Такие занятия по физическому воспитанию (фитнес-программы) должны фокусироваться на дифференцированном подходе к мотивации личности студентов, стремящихся снизить профессионально обусловленные риски для здоровья, а также должны быть направлены на корректировку ряда нарушений с помощью физических упражнений. Для удовлетворения особых потребностей студентов художественного профиля применение принципов универсального дизайна предполагает разработку специальных академических программ, методик обучения, наличие специализированного оборудования и формирование дизайна предметно-пространственной среды спортзала.*

Ключевые слова: *позитивное отношение, художественное направление, физическая подготовка, универсальный дизайн для обучения, студенты, мотивация.*

Introduction. The onrush of technical progress makes human life more comfortable, but simultaneously reduces physical activity Tendency to hypodynamia has become a serious problem of today's society, resulting in a range of health and social issues. The young students, whose body does not receive enough motor activity, do not function and develop properly. It causes to the wrong work of the musculoskeletal system, blood circulation, cardiovascular and nervous systems. The prolonged sitting at an easel or standing on the high trestle or any work-platform in one pose negatively affects a would-be artist's health.

Studies have proved negative attitudes towards physical activities and physical training classes in students compared to pupils [3; 16; 17]. In addition, in accordance with official statistics about 30 % of university graduates are almost professionally inapplicable because of poor health [1]. The past twenty years have seen increasingly rapid advances in the field of health improvement of young men [8; 15], the development of their physical and functional state during the period of higher school education [6].

Recently researchers have shown an increased interest in an adaptation of higher education for students with disabilities [4; 9] that involves the use of a differentiated strategy of the health process in sports activities. There is a volume of published studies describing the role of universal design. Nowadays the notion of universal design coined by the architect Ronald Mace stresses the high value on the inclusiveness of educational programs, services, and environments [13]. Universal design for learning (UDL) is quite new. Questions have been raised about creating the welcoming, accessible, and usable spaces [2; 5]. Debate continues about the best strategies for the creation of educational curriculum [10] which could "reflect an awareness of the unique nature of each learner and the need to address differences" [11].

So far, however, there has been little attention paid to professional peculiarities of the university students connected with physical health risks and creation of comfortable conditions in the sports spaces providing supports for students' physical rehabilitation. This paper will focus on the specificity of an art higher educational institution that touches the development of students' motivation, artistic taste, and skills, and covers the tasks of implementation of decorative artistic elements in the design of a gym.

The purpose of this research is to determine whether art-students' attitudes to physical training can be changed into strongly positive ones by implementation UDL principals.

Materials and methods. The survey comprised 18–21-year-old young people who are the first, second and the third-year students of Kharkiv state academy of design and arts, Ukraine. Altogether, 90 students were involved in the research. The research was conducted during the whole academic year 2018/2019. Prior to collecting data, the authors obtained ethics approval from the Academy administration and the Committee of Students. Thus, all the participants cooperated of their own free will. The research methods used in the investigation were the attitude questionnaires (Participation Motivation Questionnaire (PMQ) [7] particularly intended for the young, whose motivation is very diverse, and Chi-square test analysis (X 2).

All the participants were divided into 3 groups of students according to a different year of education. The Questionnaire contains a list of 30 potential motives or reasons for sports participation. The students evaluated each item on a three-level ordinal scale, such as very important; somewhat important; not important.

After being filled in the completed questionnaires were collected. For analysis of the

correlation between the declared attitude data of the questionnaires and attitudes towards physical training classes of the same art-students in terms of doing sports frequency, statistical significance was analyzed using the Chi-square test (X 2) as appropriate. In this case, all the participants were divided into 3 groups of students according to the level of their motivation created in the framework of the UDL principles use.

Results. The declared attitude questionnaires analysis results are shown in Table 1a.

By exploring the attitudes towards physical education and using the reason analysis, the authors have obtained the following general characteristics: we have found prevailing indifferent attitudes (46,7 %) towards physical training over positive and negative ones. Out of the 90 art-students, only 21 persons (23.3 %) showed positive attitudes.

The results of Table 1b are proved by exploring the attitudes towards PE classes and using the reason analysis. The students showed the needs in the following key incentives (see Table 1b).

These results proved us the significance of activity to arouse the art-students' motivation by implementing universal design principals based on the account of individual characteristics.

In order to highlight the correlation between a desirable evaluation of sports activity and real engagement in going in for sports, we applied Chi-test analysis of art-students' attitudes to physical and sports education in terms of doing sports frequency.

Table 2 shows the general attitudes of non-motivated art-students to physical and sport education in terms of doing sports frequency.

As one can see from the results that the general attitudes towards physical training classes of art-students in terms of doing sports frequency shows the worse situation than the results of the students' declared desire analysis. When comparing the results of declared art-students' attitudes with the ones in terms of doing sports frequency, in general only minimal difference in quantity can be seen (Table 1a). But we have noticed the positive tendency of the growth of desire to the classes of physical training, with increasing the students' age and years of education. The results are proved statistically, the chi-square statistic is 29.1597. The *p*-value is < 0.00001. The result is significant at $p < .05$.

Table 3 shows a significant difference in positive *attitudes between the motivated students*, who have taken part in discussions with their teachers and classmates about the professional aftereffects or who have already had own bad experience (up to 37,8 %), *and the non-motivated ones* (26,7 %).

We can especially clearly notice the tendency to positive attitudes towards physical training classes of the motivated art-students between 1-st year students (8,9 %) and 3-d year students (16,7 %) is in favour of the latter.

Since UDL principles can be applied to all aspects of an educational process, so in the research, we have observed and monitored the changes *of art-students' attitudes towards physical training classes in terms of doing sports frequency after creation professionally oriented conditions of the gym according to the UDL principles.*

Table 4 shows that in the group of the motivated students attending PE classes under conditions of the newly developed curriculum and newly designed the environment of sports space there is an obvious tendency to the strong positive attitudes to physical education (21 persons, that is 70 %) which can be considered being the life's beliefs. An indifferent attitude that is correlated to PE attendance of middle frequency was considerably reduced (16 persons (53.3 %) of the motivated students' group versus 6 students (20 %) of the "motivated + UDL conditions" group). The results are proved with the chi-square statistic that is 35.2229. The p-value is < 0.00001. The results are significant at $p < .05$.

Discussion. In addition, the current findings add substantially to our understanding of the goals attractive for the art students. This view is supported by Tkavc [14] who writes that positive aspects of physical exercise can be achieved when the exercise is based on the principles of physical recreation and fulfills its purpose and objectives.

The results of this study indicate the negative attitudes towards PE classes with a low level of motivation in the freshmen – the would-do artists to the older students. This result may be explained by the fact that the first-year student group contains the people who do not feel the strong necessity to maintain their physical abilities. The freshmen have not been working hard for long hours yet. They do not have to spend much time at the easels or on the trestle, so their muscles do not exercise stress. They are not merged into professional real life. However, the majority of the first-year students stated that the potential health reasons which could cause them to start regular physical exercising would have to be too serious and evident.

According to the educational programme of the higher art educational institution, the main part of its curriculum is connected with the necessity of standing or sitting positions (easel painting or monumental painting, drawing classes). So having experienced the long hours of physical activity, the second-year students want to remain in good physical condition. In addition, their teachers explain to their students the probable negative professional side-effects for their health because of completing huge art projects.

Table 1a

Attitudes	Number	%
Important (**positive**)	21	23.3
somewhat important **(indifferent)**	42	46,7
not important **(negative)**	27	30.0
TOTAL	90	100

Table 1b

The attitudes towards PE classes by using the reason analysis

Year students	not important	somewhat important	important
1-st year students (30 persons)	recreation (e.g. “I would like to do something for my health”)	relaxation (e.g. “I would like to have fun with my classmates”)	success and desire to be admired (e.g. “I like winning” or “I want to be popular with classmates”)
2-d year students (30 persons)	developing abilities (e.g. “I would like to learn how to play well”)	recreation (e.g. “I would like to refresh my health”)	relaxation (e.g. “I want to release tension”)
3-d year students (30 persons)	developing abilities (e.g. “I would like to learn how to play well”)	friendship (e.g. “I like spending time with my friends”)	rehabilitation (e.g. “I want to prevent bad complications of professional diseases”)

Table 2

General Attitudes of non-motivated art-students to physical and sport education in terms of doing sports frequency

Attitudes	Negative (not important)		Indifferent (somewhat important)		Positive (important)		Total
Year	n	%	n	%	n	%	n
1-st year students	13	14,4	11	12,2	6	6,7	30
2-d year students	8	8,9	15	16,7	7	7,8	30
3-d year students	7	7,8	12	13,3	11	12,2	30
Total	28	31,1	38	42,2	24	26,7	90 \ 100 %

Table 3

Attitudes towards physical training classes of the motivated art-students

Attitudes	Negative (not important)		Indifferent (somewhat important)		Positive (important)		Total
year	n	%	n	%	n	%	n
1-st year students	11	12,2	11	12,2	8	8,9	30
2-d year students	7	7,8	12	13,3	11	12,2	30
3-d year students	6	6,7	9	10,0	15	16,7	30
Total	24	26,7	32	35,5	34	37,8	90 \ 100 %

Table 4

Attitudes towards physical training classes of the motivated art-students in terms of doing sports frequency

	Low Frequency	Middle Frequency	High Frequency	***Row Totals***
Group 1. Non-motivated	18 (8.33) [11.21]	8 (10.00) [0.40]	4 (11.67) [5.04]	30
Group 2. Motivated	4 (8.33) [2.25]	16 (10.00) [3.60]	10 (11.67) [0.24]	30
Group 3. Motivated + UDL conditions	3 (8.33) [3.41]	6 (10.00) [1.60]	21 (11.67) [7.47]	30
Column Totals	25 (27.8 %)	30 (33.3 %)	35 (38.9 %)	**90 (Grand Total)**

The third-year students who are engaged in real-life professional activity have repercussions of continuous stress of the same group of muscles because of prolonged staying in one position. Almost all respondents showed a fairly good understanding of the health risks without physical exercising focused on rehabilitation.

The questionnaires have consistently shown that the first-year students in comparison to the third-year ones have not attained an adequate understanding of rehabilitation and preventive supports of PE classes. The results shoe difference in interpreting of the notion "recreation" which the first-year student understands as a kind of pastime without definite aim. And the gradual increase of PE classes meaningfulness for them indicates an adequate understanding of its necessity that puts physical education in the category of important life goals of the older students.

These findings are in agreement with Benjamin A. Sibley & Shawn M. Bergman (2018) idea about students' intrinsic goals, such as developing skills or improving health that was found to predict greater psychological need satisfaction [12]. Remarkably, such characteristics as a team atmosphere (e.g. "*I like group-work or teamwork"*) was not practically mentioned by the would-do artists, that fact proves the significance of individual goals or an artist' preference for an individual incentive. So we can conclude that for the art-students the sports activities related to a particular state of a person's health are more preferable to team sports or target games.

In the process of motivation for sports training, an important point is the creation of comfortable conditions of sports spaces. The empirical findings in this study provide a new understanding of the choice of physical education programmes. In the framework of a higher art school, the main part of the curriculum of which is associated with prolonged standing (e.g. painting), the most accessible and effective sports programs appear to be fitness programs. Recreational sports activities contribute to the further improvement of the students' capacity for work and creativity.

In developing the sports classes, the authors of the educational program took into account the following:

- motivating strategies for encouraging;
- ensuring a safe environment for performing sports tasks (reducing extraneous sounds, lighting devices);
- it is a logically structured functional planning solution of sports spaces;
- use of colour elements into a design-solution of the gymnasium (the sports equipment, sports mat, etc.);
- implementation of decorative artistic elements, such as stained glass;
- use of modern environmentally friendly finishing materials;
- creation of a comfortable light mode;
- availability of ventilation systems;
- use of a ramp;
- taking into account art-students' colour perception of sports space and PE equipment.

It is closely connected with a consideration of the peculiarities of the students' psycho-emotional state that depends on the constant impact of the saturated colours during their main classes. Thus, when forming the design organization of sports space for the students engaged in painting and for a long time standing and constantly feeling muscular overstrain, the result of the influence of active colour spots should be taken into account. The students of an art university are in the conditions of active colour rendering of the internal space of their room, therefore, when designing a gym professionally, we considered the fact that sports activity depends on the balance of colour and tones relations for solving the subject-spatial environment.

Hence, the main methods of organizing the interior of the gym could be identified as follows:

1. Techniques for organizing a gym:

- simplicity and understanding of the specifics of sports equipment use on the intuitive level;
- development of the specialized sports equipment on the basis of standard ergonomic dimensions;

- technological and technical improvement of specialized sports equipment according to the requirement of successful implementation of a variety of tasks;

2. Design techniques for organizing a gym:

- usage of sports mats of different colours that allows creating a friendly atmosphere at the process of physical exercises (active program, a slow concentrated meditative exercise);
- division of the gym space into functional zones, under the use of the specialized equipment;
- space for physical exercises developed with visual information on the floor clear for all the students. For example, different colour bands on the floor highlighted zones in 1m, 2m, etc.; the choice of colours encouraged students to perform the specially worked our complex of exercises.

Conclusion. Returning to the questions raised at the beginning of this study, it is now possible to state that the art-students' positive attitudes towards sports activities may be developed by using of universal design principles that can be applied to all aspects of physical education organization.

The current findings add substantially to our understanding of the goals actually attractive for the art students as a specific professional group. The environment of gyms is closely linked with individual motivations aiming both to reduce professional health risks and to treat disabilities by physical exercises. Taken together, the results suggest that the UDL implementation allows creating curriculum, teaching techniques, equipment, and interior design of the gym to meet the peculiar needs of the art-students.

This research has thrown lots of PE organization aspects in need of further investigation.

Conflicts of interest – The authors declare that there is no conflict of interests.

Bibliography:

1. Оценка состояния здоровья студентов-первокурсников [Text] / Р. Н. Захарова, А. В. Тимофеева, А. Е. Михайлова, Л. Ф. Тимофеев // Проблемы социальной гигиены, здравоохранения и истории медицины. — 2014. — № 4. — С. 6–8.
2. Bar L. The accessible school: Universal design for educational settings [Text] / Laurel B. Bar, Judith Galluzzo. — Berkeley, CA : MIG Communications, 1999. — 73 p.
3. Bartík P. (2009). Úroveň postojov k telesnej výchove a športu žiakov ZŠ v stredoslovenskom regióne [Text] / Pavol Bartík // Šport a zdravie : proceedings of Vedecká konferencia s medzinárodnou účasťou (17 september 2009, Nitra — Slovensko) / Univerzita Konštantína Filozofa v Nitre Pedagogická fakulta, Katedra telesnej výchovy a športu. — Nitra : UKF PF KTVŠ, 2009. — Strany 19–25.
4. Bodnar I. The effect of physical activity interventions on development of children with autism spectrum disorder. content-analysis of researches [Text] / I. Bodnar, A. Hamade // Pedagogics, psychology, medical-biological problems of physical training and sports. — 2019. — Vol. 23, no. 3. — 118–25. https://doi.org/10.15561/18189172.2019.0302
5. Burgstahler S. Equal access: Universal Design of Physical Spaces [Electronic resourse] / Sheryl Burgstahler. — Seattle : University of Washington, [2017]. — Electronic data. — Access mode : www.uw.edu/doit/Brochures/Programs/equal_access_spaces.html (date of application : 08.08.2019). — Screen title.
6. Examining Sport and Physical Activity Participation, Motivations and Barriers among Young Malaysians [Text] / Chiu Khong Lim, Muhammad Mat Yusof, Mohd Sofian Omar Fauzee, Ahmad Tajuddin Othman, Mohd Salleh Aman, Gunathevan Elumalai, Hamdan Mohd Ali // Asian Social Science. — 2016. — Vol. 12, issue 1. — P. 159–171. DOI:10.5539/ass.v12n1p159
7. Gill D. L. Participation motivation in youth sports / D. L. Gill, J. B. Gross, S. Huddleston [Text] // Psychology of motor behavior and sport / G. C. Roberts & D. M. Landers (Eds.). Champaign, IL. : Human Kinetics, 1980. — P. 111.
8. Modern methodic of power cardio training in students' physical education [Text] / A. Yu. Osipov, M. D. Kudryavtsev, I. E. Kramida, S. S. Iermakov, V. A. Kuzmin, L. K. Sidorov // Physical Education of Students. — 2016. — No. 6. — P. 34–39. DOI:10.15561/20755279.2016.0604
9. Moriña A. 'We aren't heroes, we're survivors': higher education as an opportunity for students with disabilities to reinvent an identity [Text] / Anabel Moriña // Journal of Further and Higher Education. — 2017. — Vol. 41, issue 2. — P. 215–226. https://doi.org/10.1080/030987 7X.2015.1070402
10. Orkwis R. A curriculum every student can use: Design principles for student access. ERIC/OSEP Topical Brief [Electronic resourse] / Raymond Orkwis, Kathleen McLane. — Reston, VA, 1998. — Electronic data. — ERIC/OSEP Special Project on Interagency Information Dissemination. (ERIC Document Reproduction Service No. ED423654). — Access mode : www.eric.ed.gov/ERICWebPortal/contentdelivery/servlet/ERICServlet?accno=ED423654 (date of application : 08.08.2019). — Screen title.
11. Rose D. H. Teaching every student in the digital age: Universal design for learning [Text] / David H. Rose, Anne Meyer. — Alexandria, VA : Association for Supervision and Curriculum Development, 2002. — 228 p. — ISBN 0-87120-599-8.
12. Sibley B. A. What keeps athletes in the gym? Goals, psychological needs, and motivation of CrossFit™ participants [Text] / Benjamin A. Sibley, Shawn M. Bergman // International Journal of Sport and Exercise Psychology. — 2018. — Vol. 16, issue 5. — P. 555–574. DOI: 10.1080/1612197X.2017.1280835
13. Story M. F. The universal design file: Designing for people of all ages and abilities [Electronic recourse] / Molly Follette Story, James L. Mueller, Ronald L. Mace. — Raleigh : North Carolina State University, 1998. — Electronic data. — Access mode : www.ncsu.edu/ncsu/design/cud/pubs_p/pudfiletoc.htm (date of application : 01.27.2017). — Screen title.
14. Tkavc S. Gibalne sposobnosti v povezavi s športno dejavnostjo in nekaterimi morfološkimi značilnostmi ter struktura motivov pripadnikov stalne sestave Slovenske vojske [Text] : magistrska naloga / Suzana Tkavc ; University of Ljubljana. — Ljubljana : Fakulteta za šport, 2004. — 328 strani.
15. Tulyakova O. Informative indices of physical and functional state of young men during the process of adaptation to learning [Text] / O. Tulyakova, M. Avdeeva // Pedagogics, psychology, medical-biological problems of physical training and sports. — 2018. — Vol. 22, no. 1. — P. 44–49. https://doi.org/10.15561/18189172.2018.0106
16. Zengin S. An investigation of the attitudes of the secondary and high school students towards physical education lesson based on gender and education level variables [Text] /

Serkan Zengin, Mesut Hekim, Hakan Hekim // Journal of Human Sciences. — 2016. — Vol. 13, issue 2. — P. 3242–3251. DOI:10.14687/jhs.v13i2.3944

17. Zeng H. Z. Attitudes of High School Students toward Physical Education and Their Sport Activity Preferences [Text] / Howard Z. Zeng, Michael Hipscher and Raymond W. Leung // Journal of Social Sciences. — 2011. — Vol. 7, issue 4. — P. 529–537. DOI:10.3844/jssp.2011.529.537

References:

1. Zakharova, R. N., Timofeeva, A. V., Mikhailova, A. E., Timofeev, L. F. (2014). Otsenka sostoyaniya zdorov'ya studentov-pervokursnikov [The evolution of health condition of first year students]. *Problemy social'noj gigieny, zdravookhraneniia i istorii meditsiny*, *4*, 6–8. (In Russian)
2. Bar, L., & Galluzzo, J. (1999). *The accessible school: Universal design for educational settings*. Berkeley, CA : MIG Communications.
3. Bartík, P. (2009). Úroveň postojov k telesnej výchove a športu žiakov ZŠ v stredoslovenskom regióne [The level of the attitudes of pupils at primary schools in region of Central Slovakia to Physical Education and Sport] In Šport a zdravie : proceedings of *Vedecká konferencia s medzinárodnou účasťou* (17 september 2009, Nitra — Slovensko), (pp. 19–25). Nitra : UKF PF KTVŠ. (In Slovak)
4. Bodnar, I., & Hamade, A. (2019). The effect of physical activity interventions on development of children with autism spectrum disorder. content-analysis of researches. *Pedagogics, Psychology, Medical-Biological Problems of Physical Training and Sports, 23*(3), 118–125. https://doi.org/10.15561/18189172.2019.0302
5. Burgstahler, S. [2017]. *Equal access: Universal design of physical spaces.* Seattle : University of Washington. Retrieved from www.uw.edu/doit/Brochures/Programs/equal_access_spaces.html.
6. Lim, K. C., Yusof, M. M., Fauzee, M. S. O., Othman, A. T., Aman, M. S., Elumalai, G. & Ali, H. M. (2016). Examining Sport and Physical Activity Participation, Motivations and Barriers among Young Malaysians. *Asian Social Science, 12*(1), 159–171. DOI:10.5539/ass.v12n1p159
7. Gill, D. L., Gross, J. B., & Huddleston, S. (1980). Participation motivation in youth sports. In G. C. Roberts & D. M. Landers, eds, *Psychology of motor behavior and sport*, (pp. 111). Champaign, IL. : Human Kinetics.
8. Osipov, A. Yu., Kudryavtsev, M. D., Kramida, I. E., Iermakov, S. S., Kuzmin, V. A., Sidorov, L. K. (2016). Modern methodic of power cardio training in students' physical education. *Physical Education of Students, 6*, 34–39. DOI:10.15561/20755279.2016.0604
9. Moriña, A. (2017). 'We aren't heroes, we're survivors': higher education as an opportunity for students with disabilities to reinvent an identity, *Journal of Further and Higher Education, 41*(2), 215–226. https://doi.org/10.1080/0309877X.2015.1070402
10. Orkwis, R., & McLane, K. (1998). *A curriculum every student can use: Design principles for student access. ERIC/OSEP Topical Brief.* Reston, VA: ERIC/OSEP Special Project on Interagency Information Dissemination. (ERIC Document Reproduction Service No. ED423654). Retrieved from www.eric.ed.gov/ERICWebPortal/contentdelivery/servlet/ERICServlet?accno=ED423654.
11. Rose, D. H., & Meyer, A. (2002). *Teaching every student in the digital age: Universal design for learning*. Alexandria, VA : Association for Supervision and Curriculum Development.
12. Sibley, B. A. & Bergman, Sh. M. (2018). What keeps athletes in the gym? Goals, psychological needs, and motivation of CrossFit™ participants. *International Journal of Sport and Exercise Psychology, 16*(5), 555–574. DOI: 10.1080/1612197X.2017.1280835
13. Story, M. F., Mueller, J. L., & Mace, R. L. (1998). *The universal design file: Designing for people of all ages and abilities.* Raleigh, North Carolina State University. Retrieved from www.ncsu.edu/ncsu/design/cud/pubs_p/pudfiletoc.htm.
14. Tkavc, S. (2004). Gibalne sposobnosti v povezavi s športno dejavnostjo in nekaterimi morfološkimi značilnostmi ter struktura motivov pripadnikov stalne sestave Slovenske vojske [Physical abilities concerning sport activity and some morphological features and structure of motives of members of the permanent composition of the Slovenian Armed Forces]. *Bachelor's thesis.* Ljubljana : University of Ljubljana, Fakulteta za šport. (In Slovenian)
15. Tulyakova, O., & Avdeeva, M. (2018). Informative indices of physical and functional state of young men during the process of adaptation to learning. *Pedagogics, Psychology, Medical-Biological Problems of Physical Training and Sports, 22*(1), 44–49. https://doi.org/10.15561/18189172.2018.0106
16. Zengin, S., Hekim, M., & Hekim, H. (2016). An investigation of the attitudes of the secondary and high school students towards physical education lesson based on gender and education level variables. *Journal of Human Sciences, 13*(2), 3242–3251. DOI:10.14687/jhs.v13i2.3944
17. Zeng, H. Z., Hipscher, M., & Leung, R. W. (2011). Attitudes of High School Students toward Physical Education and Their Sport Activity Preferences. *Journal of Social Sciences, 7*(4), 529–537. DOI:10.3844/jssp.2011.529.537