

# On the issue of continuity in the formation of universal competencies among school graduates and university students

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**Abstract.** In recent years, the issues of preserving the health of the population and prevention of certain diseases leading to a significant deterioration in the life quality and human activity have been keenly discussed all over the world. This circumstance has significantly activated the scientific research in development and testing of educational programs, which are based on the development of the need for systematic independent physical exercises that contribute to the formation of general cultural competencies among students of educational institutions. At the same time, the level of formation of this knowledge, skills and abilities should contribute to the further continuous process of formation of universal competencies in physical culture and sports of university students. This paper aims to analyze and experimentally substantiate the need for continuity in the formation of universal competencies among schoolchildren and university students in physical culture, as the basis for successful professionally applied physical training of future specialists in various fields of economics. The conducted research shows the need to improve the organizational and content provision of physical culture in general education institutions to increase the effectiveness of organized physical culture classes, and to improve the quality of the formation of general cultural competencies (knowledge, skills, abilities).

## 1 Introduction

In recent years, the issues of preserving health of children, teenagers, and young adults have been keenly discussed in the world [1-3], as human life quality greatly depends on it [1, 3, 4]. Researchers acknowledge that a prominent role in its strengthening belongs to motor activity, which is understood as a condition of supporting high productivity of the human organism. It is emphasized that, to a great extent, life quality is determined both by social factors [5] and gender and age peculiarities [6, 7]. According to results of observations, motor activity sharply decreases with aging, which causes an increase in the risk of development of various diseases in adult life [8]. So, the issues of increasing motor activity of children and teenagers become highly relevant [9, 10]. Most young people will continue their education in various education institutions, where the problem under consideration gains social and economic importance. Physical health of young specialists will determine

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their professional productivity in the future. Thus, the search for ways to enhance and optimize the teaching of the subject of physical education is underway [11, 12]. However, analysis of the performed studies shows that attempts to solve the outlined problems are taken outside the context of formation of key personality competences.

In Russia, there is a constant search for solutions to existing problems with the involvement of various structures of public health service, education, physical culture and sports, etc. [13-14]. Understanding of the importance of public health preservation and strengthening by public authorities is expressed in implementation of the National project "Demography" in all subjects of the Russian Federation in 2019-2024. This project includes five Federal projects, one of which is "Sport is the Norm of Life". This project states, that it is necessary to create "conditions for physical culture and sports, popular sports...for all population categories and groups" [15]. Importance of the project for the younger generation is emphasized particularly. Involvement of students of educational institutions of any level in systematic independent physical exercises is a significant constituent of the healthy lifestyle.

As it was mentioned above, solving of the existing problem has high practical importance. The given circumstance significantly activated scientific research on development and testing of educational programs based on the development of the need in regular independent physical exercises [16]. The relevant content of physical culture classes at school, even in conventional organizational forms, is believed to contribute to the formation of students' skills of independent exercises [9, 10]. In such conditions, equipping students with theoretical knowledge and methodical skills for individual physical exercises, methods of self-control of one's health, physical development, functional state of one's organism and level of development of physical qualities comes to the fore. Practical exercises are meant to form "the skill to fulfill complexes of general development, health-promoting and corrective exercises addressing individual abilities and special characteristics, state of health and mode of educational activity; acquiring basics of technical actions, skills and physical exercises of basic sports, the skill to use them in various forms of game and competition activities; expanding motional experience by exercises oriented at development of basic physical qualities, increasing functional possibilities of basic organism systems..." [17, 18], i.e. physical culture and sports exercises in this case shall contribute to formation of general cultural competences of students of general education institutions. At that, the level of formation of the knowledge, skills and abilities shall contribute to further continuous process of formation of universal physical culture and sport competences of university students. Continuity must be preserved, only in this case the formation of the physical culture of an individual at all stages of his/her life is efficient.

Analysis of scientific and academic literature on the issues of formation of general competences of students of general education institutions and universal competences of university students in physical culture and sports was performed. It showed that most first-year university students cannot meet the requirements of higher education establishments in the physical culture and sports owing to an improper level of theoretical, methodical and physical training [19-20].

The results of preliminary research were used to formulate the problem of study. This work aims to examine the level of formation of knowledge and skills in the physical culture of the individual and physical training of first-year university students at the start of their education at universities. The tasks of the study are to assess indicators of development of physical culture of the personality (theoretical knowledge, methodical skills, level of physical training) of a first-year university student that formed during the period of his/her education at a general education establishment.

## 2 Materials and methods

The study was conducted using the following methods: analysis of subject-relating sources of information, theoretical testing, testing of physical qualities, mathematical processing of results.

73 first-year students of the Chuvash State Agrarian University (23 boys and 50 girls) participated in the study. All participants had the basic medical group by the state of health for physical culture and sports.

The indicators of acquiring theoretical and methodical knowledge in the physical culture and sports by the first-year students were determined using the test tasks. The tests had 5 levels of complexity and included questions on history of physical culture and sports, general cultural and social significance of physical culture and sports, medical and biological basics of physical culture and sports, etc. and were carried out on the Moodle platform.

To assess physical training of students, the following exercises were used:

- Bending over from standing position on a gym bench (cm). It is used to assess the stretchability of back, posterior thigh and calf muscles, spine and hip mobility;
- Standing long jump (cm). It is used to assess speed and strength qualities;
- Arm bending and strengthening in push-up position (number of times). It is used to assess strength of arms;
- Running: boys – 1000 m (min., sec), girls – 500 m (min., sec). It is used to assess the general endurance;
- Pull-ups (number of times, boys). It is used to assess strength of shoulder muscles;
- One-legged wall squats (number of times, performed for both legs). It is used to assess strength of leg muscles;
- Sit-ups from back-lying position (number of times, girls). It is used to assess speed and strength training of trunk muscles.

To exclude the gap between school requirements to the level of knowledge, skills, and abilities and “entrance” indicators of physical culture and sports, the university standards of physical training for first-year students meet school standards [20, 21].

## 3 Results and discussion

Before the start of the tests, a survey among the first-year students was carried out on subjective estimation of physical culture classes at school. The survey data raised concerns. For example, 69.9% of respondents emphasized insufficiency of theoretical knowledge in the subject “Physical training” acquired at school. 17.8% of the first-year students note that they mostly obtained theoretical knowledge on their own by studying the relevant literature, and 12.3% of the students pointed out that at their schools physical training classes did not include the theoretical part. Analysis of test results showed that the level of formation of physical culture knowledge and skills of 57.5% of the first-year students was high and met university requirements. This criterion was on the medium level for 24.7% of the first-year students, 17.8% of the students had a low level of formation of knowledge and skills in physical culture and sports and did not meet university requirements.

Testing of physical training of the first-year boys and comparative analysis of the obtained results with school standards showed that speed and strength abilities (standing long jump) of 52.2% of the boys were on a medium level, 39.1% of the students had a high level of abilities, and 8.6% of the students had a low level of development of speed and strength abilities.

The flexibility test results demonstrated that 21.7% of the students had a high level of development of this quality, 43.5% of the first-year students have a medium level of flexibility development, and this indicator is below the medium level in 34.8% of the boys.

Analysis of the results of testing of strength qualities (arm bending and strengthening in push-up position) showed that at the beginning of the university education 69.6% of school leavers had a high level of development of this quality, 30.4% of students had medium level.

The results in push-ups (showing the strength of shoulder muscles) of the boys were distributed in the following way: 8.7% of respondents had high indicators, 65.2% had medium ones, 26.1% had low indicators.

The assessment of strength of leg muscles (one-legged wall squats) showed that 69.6% of the students had high results, 26.1% and 4.3% of the students had medium and low levels, respectively.

The results in running for revealing the general endurance are also disappointing. Only 8.4% of the first-year students showed a high level, 13.0% showed a medium one and 78.6% of the respondents showed a low level of development of this physical quality. The test results are given in Table 1.

The indicators of physical training of girls showed that speed and strength abilities of more than half of girls (54.0%) were on a low level of development comparing with average school standards, 40.0% of girls had a medium level of development of this quality, and only 6.0% of girls had a high level of development of speed and strength abilities.

**Table 1.** Indicators of physical training of the first-year students at the beginning of the university education (%)

Test exercises	Physical training levels		
	High	Medium	Low
Standing long jump	39.1	52.2	8.6
Bending over from standing position on a gym bench	21.7	43.5	34.8
Sit-ups from back-lying position	69.6	30.4	-
Pull-ups	8.7	65.2	26.1
One-legged wall squats (done for both legs in turn)	69.6	26.1	4.3
Running 1000 m	8.4	13.0	78.6

The tests on flexibility showed that one third of the tested girls (30.0%) had high indicators, 70.0% of girls had a medium level of development of this quality and no one of the tested students demonstrated a low level.

Girls had great difficulties in power tests, for example “trunk pull-up from back-lying position”. Most tested girls (66.0%), had a low level of development of this ability, 26.0% had a medium level, 8.0% had a high level.

At the same time, in the test “sit-ups from lying position” (strength of arms) the girls showed the results opposite to those of the previous test: 64.0% of girls had a high level of development of strength of the shoulder muscles, 32.0% and 4.0% of girls demonstrated medium and low levels, respectively.

The results of the test “right (left) legged wall squat” (strength of leg muscles) showed the following distribution of values by levels: high – 34.0%, medium – 24.0%, low – 42.0%.

As for 500 m running, the girls had the following indicators: 12.0% of the first-year students had a high level, 24.0% had a medium level, and 64.0% of girls had a low level of development of general endurance. The data are given in table 2.

**Table 2.** Indicators of physical training of girls, first-year university students, at the beginning of the university education (%)

Test exercises	Physical training levels		
	High	Medium	Low
Standing long jump	6.0	40.0	54.0
Bending over from standing position on a gym bench	30.0	70.0	-
Arm bending and stretching in push-up position	66.0	26.0	8.0
Sit-ups from lying position	4.0	32.0	64.0
One-legged wall squats (done for both legs in turn)	34.0	24.0	42.0
Running 500 m	12.0	24.0	64.0

Based on data from Tables 1, 2 and the results of theoretical knowledge tests, one can state that there is a connection between the level of formation of competences in the physical culture and sport and the level of physical training of students. This is also confirmed by the provision of psychological theory of activity on its functional characteristics. According to it, productivity of any activity is determined by completeness of pre-formed orienting basis. Moreover, the orienting basis of activity in the physical culture has a great potential in formation of a motive for activity. It is the motive that in combination with the orienting basis ensures effectiveness of implemented activity, which in our case is physical and sport activity.

## 4 Conclusions

Thus, the conducted study emphasizes the need for the improvement of organization and content provision of physical culture in general educational establishments. It is necessary to provide the organization of theoretical classes in this discipline on a mandatory basis, similarly to the content of physical culture in higher educational institutions. In this case, there arises the possibility to provide for continuity in development of several universal competences during transition from the school level to the higher level of education. This will not only result in creation of favorable conditions for formation and further development of the physical culture of a young specialist's personality, but also enable enhancement of functional capabilities of the organism, which are the conditions of high productivity of future professional activity. Due to this aspect, the problem under consideration becomes a social and economic problem.

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