

DIVERSIFICATION OF SPORTS ACTIVITIES IN TECHNICAL HIGHER EDUCATION BY IMPROVING SPORTS FACILITIES

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Abstract. *This paper aims to analyse the proposals coming from the students in technical higher education, more specifically Politehnica University of Bucharest (UPB), regarding the improvement of sports facilities. It also aims to analyse their options for the activities performed in this sports complex. The activities carried out by the UPB students during physical education and sports classes are related to motor activity, types of motor learning, types of skills and motor skills, motor qualities, as well as their functional somatic and psychological characteristics. For students, these activities should be an important component of both individual health and training, given that they enable them to properly react in daily living. The UPB Department of Physical Education and Sports-Kinetotherapy provides competitive and mass activity for the following curricular subjects: football, volleyball, handball, basketball, athletics, aerobic gymnastics, table tennis, badminton, and chess. The development of sports and their transformation from exclusive sports into mass sports (swimming, skiing, tennis, etc.) have determined the UPB students to introduce these activities among their preferences regarding physical activity. Sports facilities for indoor or outdoor activities, equipment and installations must keep up with the new technical advancements and must be able to ensure the continuation of sports activities.*

Keywords: *sports activities, sports facilities, students.*

Introduction

Sport is a competitive activity consisting of a set of motor actions differentiated by branches of sport, which is aimed to improve morpho-functional and psychological abilities concretised in achievements such as record, surpassing oneself or the opponent (Dragnea et al., 2006).

It has been argued that high school sports participation increases motivation and teaches teamwork and self-discipline (Rees & Sabia, 2010).

The concept of Romanian university sport is defined as an integral part of the subsystem of activities within the national system of physical education. Sports activity in the university environment is carried out on three levels: university physical education, university sports for all and university performance sports (“Guvernul României” [Government of Romania], 2011).

Physical education focuses on improving the psycho-biometric potential of students. This is done by developing their motor and psycho-motor skills to gain physical and mental health benefits, as well as by developing their cognitive, affective and social-relational abilities. The socio-professional integration of students is enhanced by the practice of physical education and sports disciplines. (Wesselly et al., 2018)

The activity of physical education and sport in technical higher education takes many forms of manifestation, from the classes provided in the curricula (for the 1st and 2nd years) to the preparation of representative teams for student competitions, but also in the form of

independent practice of physical exercise and favourite sports for recreational purposes and to revitalise the biologic potential (Pricop et al., 2018).

Sports activities performed by students during physical education and sports classes are related to the idea of developing biomotor qualities, of disconnection, competition and socialisation, representing an important component of health and individual training to properly respond to the demands of daily living.

The main form in which the university sports activity is carried out is the physical education and sports lesson. The general objectives pursued in the physical education lesson are as follows: increasing physical and intellectual exercise capacity, harmonious development of the body, health optimisation, preventing the onset of global and segmental physical impairments, forming and maintaining proper bodily attitudes, developing overall biomotor capacity, etc. Students with unhealthy lifestyle behaviours are more likely to have poor academic performance. The findings suggest that physical education supports healthy behaviours and can help to improve academic outcomes of students (McIsaac et al., 2015).

Within the Politehnica University of Bucharest (UPB), physical education and sports lessons are organized by group of students and are scheduled weekly or once every two weeks throughout 2 or 4 semesters. The disciplines taught during physical education and sports classes are provided in the curriculum and address themes from both team sports such as basketball, football, volleyball, badminton, table tennis, and individual sports such as athletics, aerobics, chess. Participation in structured athletic activities is said to promote a wide range of social, physical, and intellectual skills, leading to better group performance (Eccles et al., 2003).

Another form of organizing the physical education and sports lesson is the preparation of UPB representative teams. The main objectives pursued in these lessons are as follows: improving the level of general and specific motor skills, learning and improving the main technical and tactical elements, learning the main organizational aspects and regulatory provisions specific to the sports branch concerned, etc. (Netolitzchi, 2010).

For the sports training lessons, the designed training programmes are essentially focused on a branch of sport. Currently, the UPB representative teams are engaged in several sports disciplines such as football, basketball, volleyball, handball, tennis, cheerleading, dance, swimming, chess, skiing, athletics, etc., and carry out their activities under the direct coordination of the teaching staff from the Department of Physical Education and Sports-Kinetotherapy (DEFS-K). The concerns of specialists have focused on constantly improving the sports training strategies, which represents a topical element generated by the need to permanently enrich the knowledge database according to the latest trends in the modern training process (Grigoroiu et al., 2015; Neagu et al., 2018; Pelin et al., 2018). In this regard, the extensive research carried out has contributed to a solid scientific foundation through the development of numerous specific disciplines.

An important element in exploiting and assessing the effectiveness of the two types of organization and development of the physical education and university sports lesson is the sports competition. Therefore, in addition to active participation in physical education and sports-kinetotherapy lessons, students are engaged in sports competitions. Sports competitions for students have the following characteristics: they are stimulating forms of

organization, represent means of increasing performance capacity, are a component of sociocultural life and can bring economic benefits (Pricop, 2011).

DEFS-K within UPB organizes biannual sports competitions for all students (Politehniada – 1st and 2nd semesters) in several sports branches: football, basketball, volleyball, tennis, table tennis, badminton, chess, skiing, swimming, athletics, aerobic gymnastics, dance, etc.

However, the development of teaching activities and student competitions at an optimal level largely depends on existing sports facilities.

We believe that the infrastructure of the sports complex that hosts the physical education and sports lessons, the training lessons for the representative teams and the sports competitions is crucial for achieving the targeted objectives.

For this reason, the present paper seeks to bring to the fore the importance of diversifying sports facilities in accordance with the current options of UPB students.

Nowadays, the sports facilities available for DEFS-K include the UPB Sports Complex and the Leu Sports Complex, totalling an area of about 15,000 m². Practical lessons with students take place in the two sports halls of UPB, as well as outdoors, on related sports grounds. Sports activities and various games seem to be the best pastimes for young people. Team sports like soccer, basketball, volleyball, football are probably the most popular sports activities among students.

The UPB Sports Complex ensures the simultaneous practice of sports activities for approximately 200 students and has the following facilities:

- outdoor fields: 1 synthetic mini football field; 2 synthetic basketball courts, 1 football field;
- indoor area: aerobics gym, sports games hall (basketball, volleyball, handball, table tennis, badminton, chess).

Within the Leu Sports Complex, there is a sports games hall (basketball, volleyball, badminton, chess) and 1 football field.

Despite the limited sports facilities as compared to the large number of students enrolled every year (almost 15,000) in the 15 UPB faculties, DEFS-K manages to largely provide an optimal environment for meeting the objectives of physical education and university sports.

However, the need to modernise the infrastructure of sports facilities is a topical element in the development of higher education. Primarily investing in the formation of sports facilities as material resources required in the near future is a strategic option with major implications in achieving sports results.

The upward trend of the university sports phenomenon at international level and the emergence of new sports branches have led students to introduce these physical activities among their preferences. Current emphasis on a limited range of team sports should be modified to provide opportunities for students who are interested in and have the skills relevant to other sports ventures, thus attracting a wider range of students (Trudeau & Shephard, 2008).

In non-profile faculties, motivation for physical activities is totally different from that of sports students. For example, a study highlights that medical students show increased interest in sports activities such as aerobics, swimming, tennis, basketball and athletics, and as a preferential alternative activity, they mention tourism (Colibaba et al., 2010). The administration of questionnaire surveys is an accurate method of assessing physical activity

behaviour and an important research priority (Bauman et al., 2006; Troiano, 2005; Wanner et al., 2013).

“Questionnaires have been shown to be able to rank people according to their activity and estimate group-level physical activity in young populations with reasonable accuracy” (Saint-Maurice et al., 2014, p. 461).

The results obtained through questionnaires provide preliminary support for further investigations as a cost-efficient method of assessing general levels of children’s and young people physical activity during the school years (Crocker et al., 1997).

Given the new technical achievements relating to sports facilities (installations, equipment), whose role is to ensure the practice of sports activities at high standards, we have considered it useful to develop a questionnaire that provides, through its content, information about the needs of young people in the technical university environment.

Methodology

Research purpose

The paper aims to present and analyse the opinions of students in technical higher education on the diversification of sports facilities and related conditions in order to increase the efficiency of activities during physical education and sports classes.

Research methods

The research methods used to conduct this study were bibliographic study, documentation, graphical method, and the questionnaire survey method was the basis of this research.

The bibliographic study method is used in the first stage of the research and aims to identify the theoretical contributions of researchers in the field of Physical Education and Sport to the topic chosen to be discussed in the current study.

Through the questionnaire survey method, we aimed to collect relatively large amounts of data in order to process them. Based on the information obtained from the research subjects, we performed the statistical analysis.

The results obtained from the questionnaire survey used in this study were interpreted by means of the graphical method.

Research content

The research was conducted by applying a closed-ended questionnaire with alternative responses.

The research analysed and interpreted the responses given by students in non-profile technical education to the following questions:

“Do you think that the UPB sports facilities are sufficient for the Physical education and sports activity?”

“Do you think that the efficiency of sports activity in UPB largely depends on existing sports facilities?”

“What improvements would be needed for existing sports facilities to meet the current requirements of UPB students?”

The development of sports facilities would create the prerequisites for the content and action systems used during classes to lead to higher levels of achievement, and thus the efficiency of the physical education and sports activity positively influences the biological potential.

Participants

A number of 724 students in the 1st and 2nd years at the Politehnica University of Bucharest were investigated using the UPB sports facilities. They were divided into two equal groups: 362 female students and 362 male students. The surveyed students were aged between 19 and 24 years. All students participating in the survey were informed about the way of conducting the research, and the ethical conditions were met.

Site and duration of study

The study took place from 7 October to 11 November 2019 in the New Building of the Sports Complex and in the UPB sports halls to complete the questionnaires. The questionnaires were summarised and processed between 11 November and 18 November 2019.

Results

To the question, “Do you think that the UPB sports facilities are sufficient for the Physical education and sports activity?”, 98% of respondents stated that the UPB sports facilities were not sufficient and needed to be improved.

To the second question, “Do you think that the efficiency of sports activity in UPB largely depends on existing sports facilities?”, 96% of students have responded that sports facilities significantly contribute to the efficiency of sports activity.

Regarding the third question, “What improvements would be needed for existing sports facilities to meet the current requirements of UPB students?”, the responses of students were summarised and expressed as a percentage in Tables 1, 2 and 3, and the graphical representation of these tables is shown in Figures 1, 2 and 3.

Table 1. *Proposals expressed by students for the improvement of UPB sports facilities*

Item no.	Sports facilities	What improvements would be needed for existing sports facilities to meet the current requirements of UPB students?	Percentage
1.	Swimming pool	61	16.85%
2.	Tennis court	39	10.77%
3.	Handball field	29	8.01%
4.	Covered football field	76	20.99%
5.	Athletics track	17	4.69%

6.	Ski and snowboard slopes	1	0.27%
7.	Cycling track	2	0.55%
8.	Horse racetrack	0	0%
9.	Fitness gym	52	14.36%
10.	Other larger rooms (martial arts, aerobic gymnastics, dance)	17	4.69%
11.	Ice rink	1	0.27%
12.	Climbing wall	1	0.27%
13.	Chess tables	9	2.48%
14.	Tennis table	37	10.22%
15.	Hot water showers	3	0.82%
16.	Sauna room	2	0.55%
17.	Bathrooms	2	0.55%
18.	Lockers	1	0.27%
19.	Modern changing rooms	5	1.38%
20.	Modern equipment (mattresses, bands, dumbbells)	4	1.1%
21.	Other amenities (more mirrors, more powerful lighting)	3	0.82%

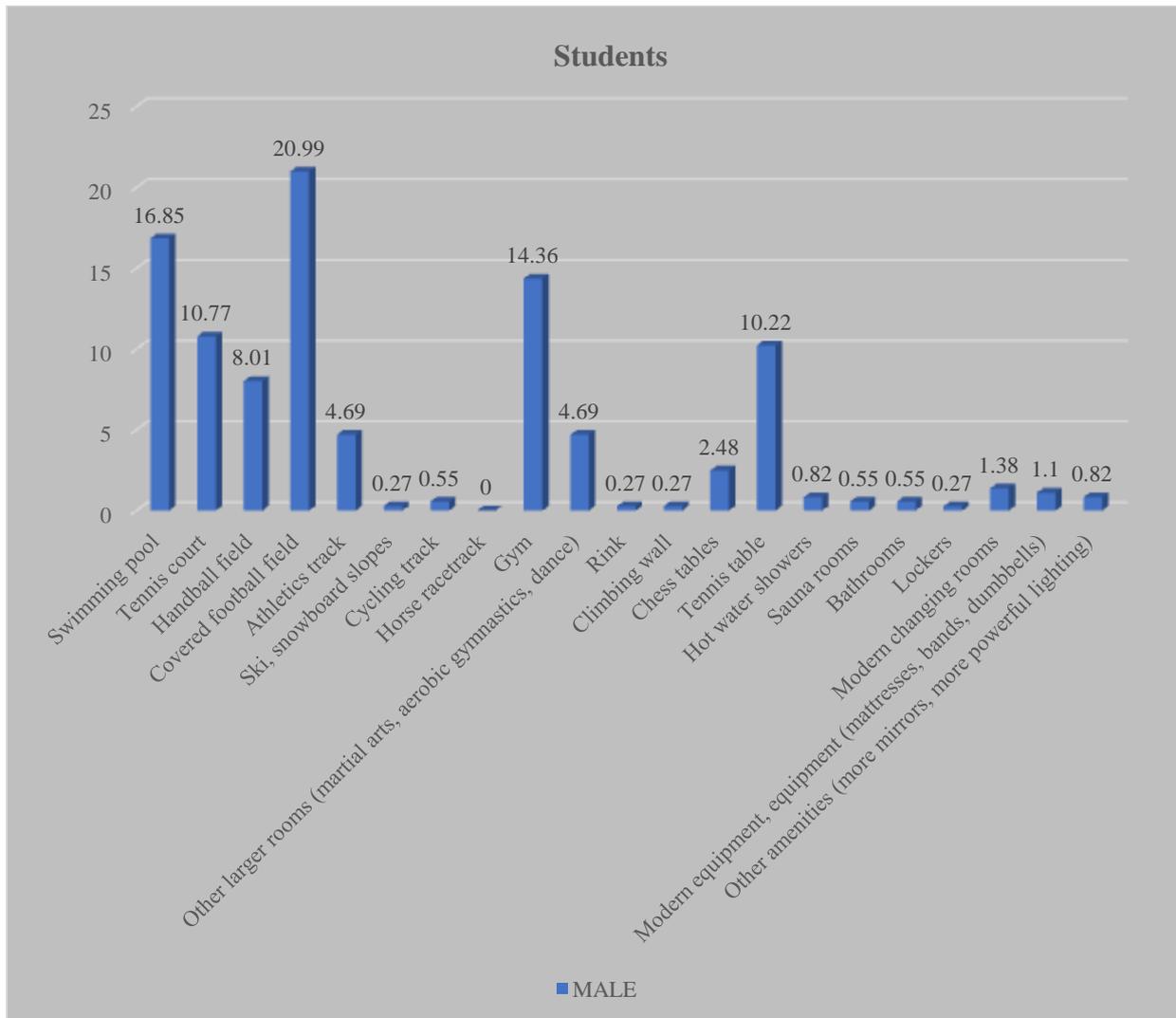


Figure 1. Proposals expressed by students for the improvement of UPB sports facilities

Interpretation of results (Male)

Table 1 and Figure 1 show that the most important requirement of students for the improvement of UPB sports facilities is related to the construction of an indoor football field. Thus, 20.99% of them would choose this activity if the sports facilities made it possible.

The next option of students refers to the construction of a swimming pool (16.88%), followed by their desire to do fitness (14.36%). Tennis is preferred by 10.77% of students. Table tennis is an activity that students would practise in a proportion of 10.22%, and handball is an activity that 8.01% of respondents would like to practise during physical education and sports classes.

The option for a larger area of sports halls is expressed by 4.69% of students. The construction of an athletics track is suggested by 4.69% of respondents.

Other opinions of the surveyed subjects regarding the improvement of sports facilities refer to indoor equipment and installations. Thus, 0.82% of students propose hot water showers at the bathrooms, 0.27% of students want safety-deposit boxes to be set up, and 1.1% of students opt for modern installations and equipment. The cycling track has a weight of 0.55%, and the ski slope has a percentage of 0.27%. Other options account for 0.82%.

The climbing wall represents 0.27% of options, chess tables, 2.48%, and the construction of an ice rink, 0.27%. A low number of responses are also recorded for a sauna room, only 0.55% of students wanting this. Modern locker rooms are the option of 1.38% of subjects, and the lockers are preferred by 0.55% of them. Other amenities have received positive responses from 0.82% of participants, and for the horse racetrack, no option is recorded.

Table 2. *Proposals expressed by girl students for the improvement of UPB sports facilities and their options for activities performed in these areas*

Item no.	Sports facilities	What improvements would be needed for existing sports facilities to meet the current requirements of UPB students?	Percentage
1.	Swimming pool	80	22.09%
2.	Tennis court	24	6.62%
3.	Handball field	11	3.03
4.	Covered football field	6	1.65
5.	Athletics track	53	14.64%
6.	Ski and snowboard slopes	1	0.27%
7.	Cycling track	1	0.27%
8.	Horse racetrack	6	1.65%
9.	Fitness gym	47	12.98%
10.	Other larger rooms (martial arts, aerobic gymnastics, dance)	34	9.39%
11.	Ice rink	7	1.93%
12.	Climbing wall	1	0.27%
13.	Chess tables	17	4.69%
14.	Tennis table	36	9.94%
15.	Hot water showers	10	2.76%
16.	Sauna room	5	1.38%
17.	Bathrooms	1	0.27%

18.	Lockers	2	0.55%
19.	Modern changing rooms	8	2.2%
20.	Modern equipment (mattresses, bands, dumbbells)	7	1.93%
21.	Other amenities (more mirrors, more powerful lighting)	3	0.82%

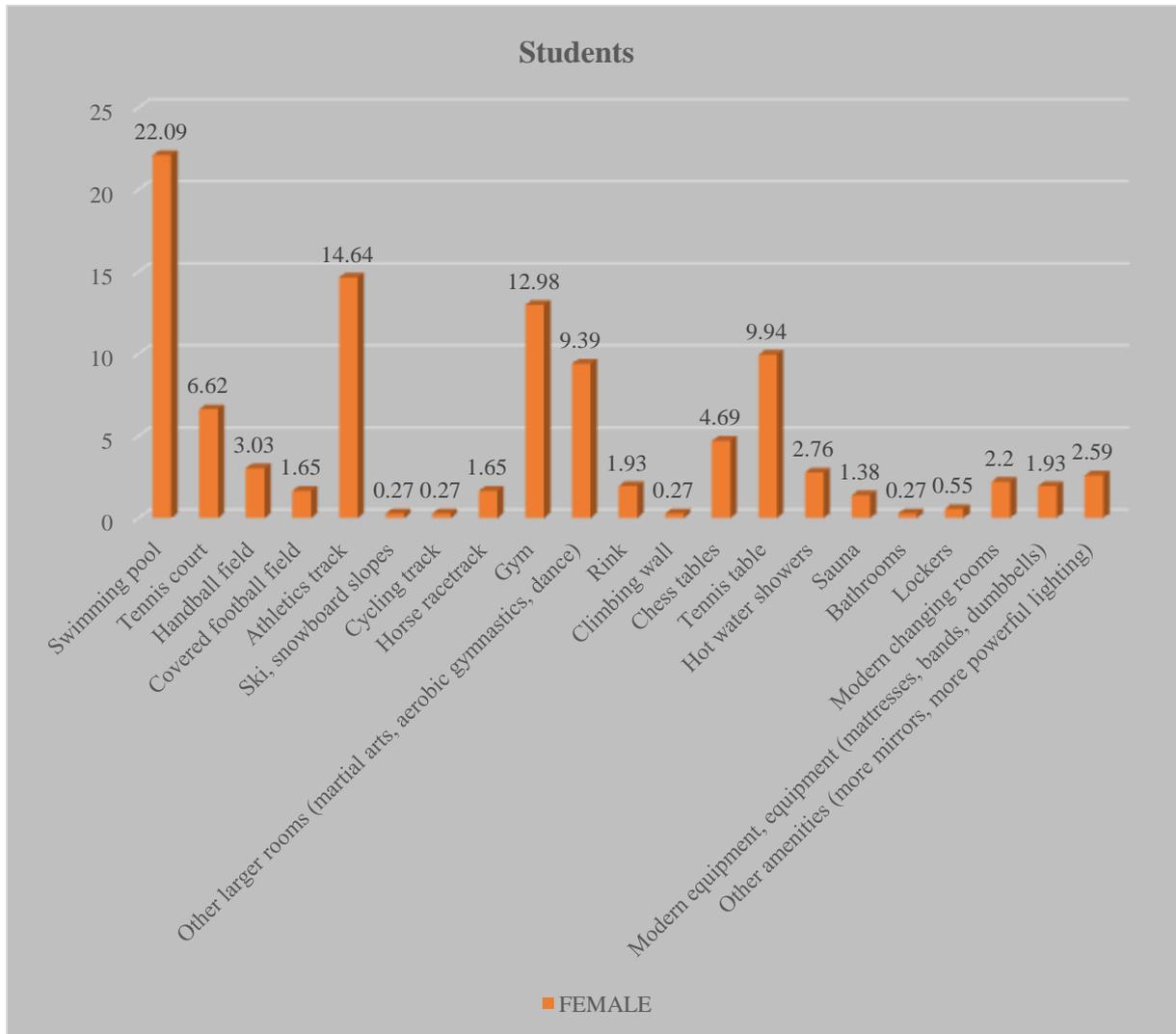


Figure 2. Proposals expressed by girl students for the improvement of UPB sports facilities and their options for activities performed in these areas

Interpretation of results (Female)

Table 2 and Figure 2 reveal that the most important requirement of female students for the improvement of UPB sports facilities is related to the construction of a swimming pool (22.09%). The next option of girl students refers to the construction of an athletics track (14.64%). Table tennis is an activity that they would practise if they had where to do this, a percentage of 9.94% of female students expressing their desire for the improvement of this

activity. Having a larger gym is agreed by 9.39% of girl students. Tennis is among the preferences of 6.62% of them, and handball gathers 3.3% of the total options.

Other opinions of female students regarding the improvement of sports facilities refer to the fitness gym, 12.98%. Arranging an equestrian centre is the desire of 1.65% of girl students, while 4.69% of them agree with the purchase of chess tables. Female students also indicated as appropriate the construction of an ice rink in a proportion of 1.93%. The indoor football field was not among their options, only 1.65% being interested in this issue. The ski and snowboard slopes had a low number of choices (0.27%), and also the cycling track (0.27%). The climbing wall was nominated by only 0.27% of girl students because climbing is not popular among female students in non-profile technical education.

Regarding indoor equipment and installations, girl students also want an improvement; thus, 2.67% of them propose hot water showers in the bathrooms, and 1.38% would like a sauna room. Another proposal refers to the modernisation of furniture (2.2%).

Modern gym equipment (mattresses, bands, dumbbells) is the option expressed by 1.93% of girl students. As regards the purchase of safety-deposit boxes for their personal goods, 0.55% of female students opted for this.

Proposals for other amenities (more mirrors, brighter lighting) gathered 2.59% of the total number of options.

Table 3. *Proposals expressed by male and female students for the improvement of UPB sports facilities and their options for activities performed in these areas*

Item no.	Sports facilities	No. of options		No. of options	
		Girl students	Percentage	Male students	Percentage
1.	Swimming pool	80	22.09%	61	16.85%
2.	Tennis court	24	6.62%	39	10.77%
3.	Handball field	11	3.03%	29	8.01%
4.	Covered football field	6	1.65%	76	20.99%
5.	Athletics track	53	14.64%	17	4.69%
6.	Ski and snowboard slopes	1	0.27%	1	0.27%
7.	Cycling track	1	0.27%	2	0.55%
8.	Horse racetrack	6	1.65%	0	0%
9.	Fitness gym	47	12.98%	52	14.36%
10.	Other larger rooms (martial arts, aerobic gymnastics, dance)	34	9.39%	17	4.69%
11.	Ice rink	7	1.93%	1	0.27%
12.	Climbing wall	1	0.27%	1	0.27%
13.	Chess tables	17	4.69%	9	2.48%
14.	Tennis table	36	9.94%	37	10.22%
15.	Hot water showers	10	2.76%	3	0.82%
16.	Sauna room	5	1.38%	2	0.55%
17.	Bathrooms	1	0.27%	2	0.55%
18.	Lockers	2	0.55%	1	0.27%
19.	Modern changing rooms	8	2.2%	5	1.38%
20.	Modern equipment, equipment (mattresses, bands, dumbbells)	7	1.93%	4	1.1%
21.	Other amenities (more mirrors, more powerful lighting)	5	2.59%	3	0.82%

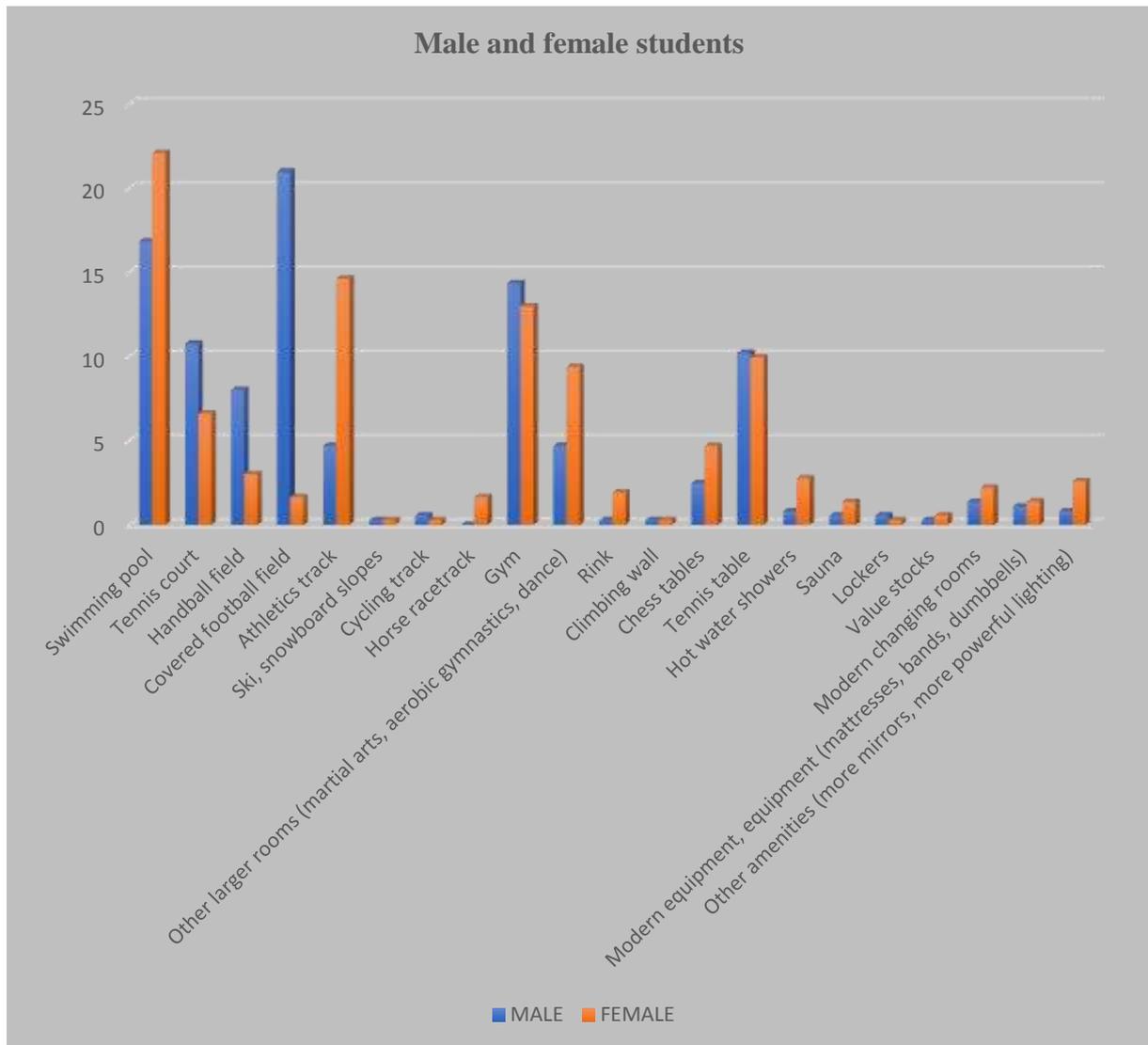


Figure 3. Proposals expressed by male and female students for the improvement of UPB sports facilities and their options for activities performed in these areas

Table 3 and Figure 3 indicate that the most important requirement of male and female students for the improvement of UPB sports facilities is related to the construction of a swimming pool. 16.85% of male students and 22.09% of female students would like to practise swimming during physical education and sports classes if they had the opportunity.

Another option of male and female students is to practise table tennis, an activity for which they would opt if they had where to do this, expressing their desire for the improvement of this activity in a proportion of 10.22% (male) and 9.94% (female), with small differences between the number of options expressed by male students compared to female students.

For the next option related to the improvement of sports activities in UPB, the differences of opinions between male and female students concerning the activities they would practise and for which they would propose the improvement of sports facilities start to be eloquent. Thus, 20.29% of male students would opt for the indoor football field, compared to only

1.65% of female students. A fitness gym is proposed by 12.98% of girl students and 14.36% of male students. A relatively large difference is noted between the options for the handball field, where 8.01% represents the option of male students, and 3.03%, the option of girl students. The athletics track is preferred by male students in a proportion of 4.69%, and by female students, of 14.64%, the recorded values being largely different. Some balance is observed between the options of the two genders as regards the ski and snowboard slopes, the former being chosen by both male and female students in a proportion of 0.27%. Girl students expressed their option for the construction of an ice rink in a proportion of 1.93%, and male students, only in a proportion of 0.27%. Having larger gyms (martial arts, aerobic, dance) was the option of 9.39% of girl students, while male students agreed to this idea in a proportion of 4.69%. The cycling track is among the options of 0.27% of female students and 0.55% of male students. A very small number of respondents opted for horse riding, only 1.65% of girl students, while the percentage of male students was 0%. The climbing wall also gathers very few options, 0.27%, with an equal percentage of the two genders. Chess is preferred by 4.69% of female students and 2.48% of male students.

In terms of indoor equipment and installations, the following options are recorded: hot water showers, 2.76% girl students and 0.82% male students; sauna room, 1.38% girl students and 0.55% male students; lockers, 0.27% girl students and 0.55% male students; safety-deposit boxes, 0.55% girl students and 0.27% female students; modern locker rooms, 2.2% girl students and 1.38% male students.

The tennis court is more appreciated by both genders, 6.62% of female students and 10.77% of male students wanting to practise tennis.

As regards the purchase of modern equipment (mattresses, bands, dumbbells), the option of male students accounts for 1.1%, while that of female students, 1.93%; for other amenities (more mirrors, brighter lighting), the percentage expressed by girl students is 2.59%, and that of male students, 0.82%.

Conclusion

After applying the questionnaire survey, we can conclude that UPB students have shown that they are receptive, enthusiastic, reforming and creative, wishing to intervene and influence the teaching process through the improvement of existing sports facilities. A high percentage (98%) of the surveyed subjects consider that the UPB sports facilities are insufficient, and 96% consider that the efficiency of sports activities largely depends on existing sports facilities.

The improvement of sports facilities, in the view of UPB male and female students, should start with the construction of a swimming pool, according to 22.09% of female students and 16.98% of male students, swimming being the most demanded sports activity that girl and male students would like to practise during physical education and sports classes, but the lack of a swimming pool makes it impossible.

The construction of an indoor football field is the option of 20.99% of male students compared to 1.65% female students. Concerning the athletics track, there is a difference between the options of the two genders, 14.61% of girl students opting for it versus 4.69%, the percentage of male students. The options for the fitness gym were relatively equal, girl

students in a proportion of 12.98%, and male students, 14.39%. It is noted that 4.69% of female students and 2.48% of male students are willing to practise chess. 1.93% of girl students propose the construction of an ice rink, and 0.27% of them propose a climbing wall. The comfort provided by the existence of lockers, modern locker rooms and a sauna room is a clear option of girl students for the improvement of sports activities. Thus, 0.27% of female students compared to 0.55% of male students opted for lockers. The options are quite equal for the means of recovery after exercise, such as the sauna room and hot water showers. Girl students opted for a sauna room in a proportion of 1.38%, while male students, in a proportion of 0.55%.

By applying the questionnaire survey, conclusive and objective data were collected about the needs of students in technical higher education regarding the equipment, installations and related materials available in the UPB Sports Complex for the sports activities they would like to practise.

Improving physical activities performed during physical education and sports classes, but also their diversification, are priorities for both male and female students in UPB. Only by improving sports facilities, the quality of performed bodily activities can increase.

The development of sports facilities could create the prerequisites for optimising the methodological content used during classes, with a direct effect on the efficiency of physical and sports activities, whose goal is to positively influence the biomotor potential of students.

In a similar study, Rață et al. (2011) have reached the conclusion that the number of those who prefer sports games is high at the beginning of high school, while at the end of upper secondary education, their preferences for sports games, especially basketball and football, decrease. The activities preferred by high-school students and found in this study are: handball, football, basketball, volleyball, tennis, jogging, aerobic gymnastics, dance. These preferences expressed by both high-school students and students in non-profile technical higher education are conditioned by the sports facilities and equipment.

Also referring to the findings of the two studies, we can state that both educational entities are considering the development of plans for the maintenance and modernisation of sports facilities and installations at national level in order to develop grassroots and performance sports.

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Authors' Contributions

All authors have equally contributed to this study and should be considered as main authors.

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