

PhD Doctoral Theses

ORGANIZATIONAL ASPECTS OF RECREATIONAL SPORTS AT THE TERTIARY LEVEL

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Debrecen, 2017

1. THE BACKGROUND, OBJECTIVES AND HYPOTHESES OF THE RESEARCH

The research seeks to clarify the organizational and operational framework of recreational sports at the tertiary level by analyzing the attitudes of the students and the sports leaders in concern. Thanks to the growing number of the students studying at the tertiary level, the demand for access to a wider range of recreational sporting possibilities has significantly increased over the past twenty years. While the students at the primary and secondary levels have physical education incorporated in their general curricula, tertiary students can earn their sports credits required to meet their degree requirements by completing either mandatory or selective courses in sport; the choice between the two options is determined by the specific curricular requirements and course offers of the given tertiary institution. Due to this, the importance of the recreational sports in the higher educational institution has increased notably. While still students, young people have their last chances to engage in sports either free-of-charge or against paying affordable charges for the services provided by the universities and colleges. After graduation, though, it is their individual preferences, motivation and material conditions that will basically determine whether they can or want to pursue any recreational sport on a regular basis. Thus, it is very important to familiarize them with the benefits and values of recreational sports while they are still students when their attitudes and preferences are easier to shape and develop. The positive experiences they can get from doing sports at university or college will raise and consolidate their commitment to sports later in their lives. The benefit from this can be twofold: these young people with commitments to sport can have an improved quality of life for their own benefit on the one hand, and even more importantly, as would-be leaders or members of the intellectual elite they will have a positive multiplier effect on their environments.

The analysis of the sporting habits of the tertiary students and the analysis of their attitudes to sports have become hot scientific issues recently. In my research I attempt to provide a comprehensive analysis of the tertiary recreational sports services both in relation to the students and to the sports leaders. I have not yet encountered any evidence in the literature of surveys with similar depth and range of investigating and comparing several institutions using a uniform framework.

My personal scientific motivation is triggered by a seventeen year long pedagogical experience in the tertiary education as a PE instructor, which also allows me to look at the area as an insider. In addition to my educational tasks, I am responsible for organizing and supervising recreational sports at my university. Thus, as one of the participants I can have direct experiences with the students, and with the organizational and operational issues of recreational sports. My commitment to recreational sports has been shaped and consolidated by this background of mine.

Research objectives

Production of structured data about the physical state of the students based on the students' self-assessments.

Analysis of the sporting habits of the students with a special focus on the most favoured types of sports, on the sporting sites, on the motivating factors, and on the causes of neglecting/quitting sport.

Assessment of the recreational sport services based on data in relation to the academic staff, the infrastructure and the sports programs. The survey comprises assessments by both the leaders and the students.

Assessment of satisfaction with the standards of the recreational sport services based on data collected from leaders and students.

Analysis of the recommendations on the improvement of the recreational sport services from leadership – student aspects.

Presentation of the organizational frames, the economic background, the sport services and the sport strategies of recreational sports at tertiary level based on data retrieved from two Hungarian research universities.

2. DATABASE AND RESEARCH METHODS

A multi-aspect approach to the target area of the tertiary recreational sport was one of my research priorities. I endeavored to identify those individuals, organizational units and other relevant components that influence the infrastructure, the organizational framework and the quality and quantity of the recreational sport services. In my research I am exploring the effects of these direct factors through primary analyses using both qualitative and quantitative methods. The sample population comprises the target group of students, and the leaders responsible for the organizational and management issues of the recreational sport. In addition, I present case studies dealing with a provincial university and with a university in the capital city.

2.1. Questionnaire survey of the students

I carried out a pilot questionnaire survey among the students of the University of Debrecen in order to underpin the improved final version of the questionnaires. I received 231 primary responses, I analysed them and having made the necessary adjustments to the questionnaire, I produced the final version. I determined the applicable research methods and procedures with the help of a relevant case study administered. The student population of the comparative study comprises students of research universities, the reason being that these institutions have the highest of all numbers of students and provide a wide range of sport services. Given that I was striving to build on a large sample size, I sent out the questionnaires to five research universities. The questionnaires were paper-based and were filled in by the students in the second term of academic year 2014/15. I used the paper-based format because in this way the questionnaires could also reach those students who are not pursuing recreational sports, or are not actively involved in any type of sport. The collected data were entered by the EvaSys method, which also made the processing of the paper-based questionnaires easier. The survey comprises 25 multiple choice questions structured in three main categories. The questions in the first category are enquiring about the sporting habits of the students, about their sport-related performances, preferences and motivations, and the causes of their neglecting/quitting sport. The second group of the questions is dealing with the students' recreational sporting habits, with the actual sport services provided by the universities and with the possibilities of improving these services. The third category is dealing with the demographic characteristics of the students.

2.2. Questionnaire survey of the sport leaders

In my survey I collected data in the sample universities in relation to the following focus points:

- Organizational framework
- Ways of sport financing

- Available infrastructure, recent developments
- Types, quantity and quality of sport services
- The specificities, financial background and organizational framework of sport events and championships.

The sport leaders' questionnaire comprises 29 closed-ended and open-ended questions all together structured in three categories. The first category contains questions concerning the recreational sporting possibilities at the institutions and the details of their financing; the second category of questions is enquiring about the potentials of improving recreational sports, while the third category is dealing with the socio-demographic characteristics of the sport leaders. The respondents formulated their own answers to the open-ended questions, and conversely, they picked an answer from a given number of options to answer the closed-ended ones. After the paper-based questionnaires had been filled out, I contacted each of the respondents personally.

2.2.1. Methods of data evaluation

Adapted to the type of data and to the focus of the individual analyses, I applied different evaluation procedures. The questionnaires were evaluated by the descriptive statistical method first; this was then followed by hypothesis analysis, the analysis of variance and the correlation analysis. I measured the students' satisfaction with their own physical condition with the Likert scale assessing the measure of the student's agreement or disagreement with the statements listed to them in the questionnaire (KEHL – RAPPAL, 2006). Both of the questionnaires comprise questions arranged in matrix tables in order to make the questions faster to answer and easier to evaluate (BABBIE, 2001).

I structured and grouped the data according to the demographic characteristics of the respondents as well, which allowed for carrying out comparative analyses of the different data groups too. After the statistical assessment of the data, I arranged the results in tables and figures. Based on the characteristics of the students and sport leaders, and of the tertiary institutions and their sport services, I developed the following variables:

- Permanent residence of the student (Budapest, county capital, town, municipality, village),
- Site of sporting activity (on-campus, off-campus),
- Geographical location of the tertiary institution (capital, country),
- Level and year of studies (BSc/BA, MSc/MA),
- Faculty,
- Place of residence during the course of studies (hostel, lodgings, own flat, commuter),

- Job(s) undertaken during studies,
- Gender of the students and the sport leaders,
- Financing background of sport services (free-of-charge, pay-services),
- Type of sport service (sporting event, championship, regular weekly service),
- Years of work by sport leaders spent in tertiary education (less than 5 years, between 5-10 years, more than 10 years),
- Job position of sport leaders (lower, middle, top level).

I compared the average data of the motives of sporting site preferences by the analysis of variance (ANOVA). For the comparison of the average values of the indicators' in relevance with gender and with the site preferences I applied the two-sample t-test. The processing of the data was supported by the 13.0 version of the SPSS statistics software program (SPSS, Chicago, IL). For the quality assessment of the recreational services I used the QSport-14 scale of sport centers and sport service centers adapted to the academic environment (YILDIZ – KARA, 2012). The scale comprises three parts: academic staff (five elements), facility (five elements) and sport programs (four elements). The reliability of the sport services was measured by the Cronbach alpha. I carried out the correlation analysis of the institutional recreational sport services in order to identify the correlation and to determine the measure of the relationship between the variables.

The sport leaders' sample

The sampling was administered at the University of Debrecen on the 2nd-3rd-4th of October 2014 when the further training of the sport leaders was taking place. The questionnaires were filled out by 42 sport leaders, of who there were twice as many women than men (Table 1). The participants of the further training were sport leaders employed by universities and colleges, thus their responses are rightfully considered as valid value judgments made by actual leaders. Six of the respondents are employed by tertiary institutions in the capital, and twelve of them are working at regional institutions. 45 percent of the respondents spent less than 5, 18 percent spent 5-10, and 37 percent spent more than 10 years working at tertiary institutions. These figures reflect the impact of the establishment of the national network of sport offices incorporated in the organizational structure of the tertiary institutions, which has also furthered the opening of new sport leaders' positions as an additional benefit. The data also reveal that the institutions in the sample represent 83 percent of the total number of full time students nationwide, which again, consolidates the representative nature of the survey sample and underpins the reliability of the research results.

Table 1: The sport leaders' sample (2015)

Gender		Higher Education Institutions In the Capital City	Higher Education Institutions In the Provincial Cities
Male	28	9	19
Female	14	3	11
TOTAL	42	12	30

Source: own research (Pfau, 2015)

As regards the qualification of the sport leaders, 90 percent of them have university or college degrees, while 10 percent have trainer's qualifications or secondary school degrees. The sample population of the sport leaders is also having students among them given that some tertiary students are having positions as heads of the sport offices at their institutions. Each of the women respondents has university or college degrees, 99 percent of them have sport specific qualifications, and 1 percent have post graduate degrees in economics. Overall, it can therefore be concluded that the sport leaders in the sample are highly qualified and fulfill the conditions required to function as leaders.

The students' sample

The sampling was administered on the research university campuses. These institutions share similar financial backgrounds and student numbers, and are operating at least five faculties (BME 8, SE 5, DE 14, PTE 10 and SZTE 12). No students undertaking sport related studies are involved in the survey. Having selecting out the non-valid questioners, I ended up with the responses of a total of 570 students. The characteristics of the students are demonstrated in Table 2 below.

The sample research institutions have on the average 9 500-23 563 students each, which in sum gives a total number of nearly 100 000 full time students. This number makes out about 50 percent of the student population studying at tertiary institutions nationwide altogether.

Table 2: Characteristics of the student sample (in percentages, 2015)

Gender		University (headcount)	
man	46%	Budapest University of Technology And Economics (BME)	20,87%
woman	54%	University of Debrecen (DE)	23,85%
		University of Pécs (PE)	17,72%
		University of Semmelweis (SE)	18,43%
		University of Szeged (SZE)	19,13%

Source: own research, 2016 (n=570)

I organized the research institutions into two groups based on their geographical locations: two institutions in the capital city (BME, SE) constitute the first, and three provincial institutions (DE, SZE, PE) constitute the second group. I applied this same classification in several other analyses later. I found that the highest proportion of the sample students (44 percent) is in their first year of tertiary studies, and the lowest is the proportion (10 percent) of those studying at MSc levels or in the conventional undivided university level programs. Many of the students tend to begin to earn their PE credits as early as in the first year of their academic studies. Given that the sampling took place in the second semester, these students were able to give reliable answers to all of my queries. The second year students constitute nearly one third (30 percent) of the sample, while only one out of six respondents were doing their third academic year. The graduate students were less inclined to complete the questioners given that as a rule they have less contact hours, are busy writing their theses or are doing their internships, which makes them less likely to reach.

The collected data allowed for the analysis of the permanent residence of the students. Here I found that 36.47 percent of the students reside in towns, 23.14 percent live in municipalities or villages, 17.84 percent live in Budapest and 22.55 percent have residences in county capital towns. The highest proportion of the students in the sample (38.25 percent) spends their study years in lodgings. The second most popular domicile is in hostels (34.25 percent). 20.75 percent live in the neighborhood of the universities and can commute there from their homes. As low as 2.75 percent of the respondents have their own flats, while 4 percent have other types of accommodation with friends or relatives.

2.3. Case study

My ambition was to introduce the sport organization of a high prestige tertiary institution in order to set it as an example to follow by other institutions. In the case study I analyse the organizational, infrastructural, financial and human resources background underpinning the institutions' high standard achievements. I survey the sport strategy of the institutions with a special focus on the recreational aspects. I lay a special emphasis on the examination of the characteristics of the recreational sport events and championships, and of the system of information flow within the organization. I introduce the history of the sport organizational units highlighting their recent developments and the challenges they had to cope with. I measure the satisfaction of the sport leaders, analyse the causes of dissatisfaction and the ways of eliminating these causes.

Given that I was meaning to prepare a comparative case study, I administered the very same questioners to two institutions. I collected and analysed the data retrieved from two research institutions, the Budapest University of Technology and Economics (BME) and the University of

Debrecen (DE). They both have similar numbers of students and similar backgrounds. The study incorporates several cases with identical research questionnaires filled in by a growing number of organizations. I analysed the responses and identified the deviations between them

I collected the data by different research methods: I visited the universities personally making notes of the sport events and sport organizational structures at both; I participated in the sport events they organized; I analysed the regulations of the universities and some of the archive documents; I documented several personal discussions and made interviews with the sport leaders of the universities. These semi-structured interviews contain 18 questions and three clusters of questions. I had responses from 3 sport leaders of the two institutions.

The flow of data collection was continual and ever growing during the past year. The value of the retrieved information was changing: some became outdated meanwhile, others grew in importance. Observing the theoretical rules of data collection (LINCOLN – GUBA, 1994), I finished the collection and analysis of the data in 2016 when the resources got exhausted, the categories got filled up, and data regularity and data overload were taking place.

After selecting the events and data that are relevant to my research objective, I analysed the data with the method of categorical aggregation (STAKE, 1994). The conclusions drawn from any set of results are considered to be reliable only if they have ample evidences to support them. I compared my results with those available in the literature and found that my results are in compliance with the theoretical standards. An additional major advantage of the case study method is that it examines the events and the organizations in their natural environments, which makes the results look more realistic.

3. MAJOR CONCLUSIONS

I structured the data gathered from the students of the research universities into groups according to a set of characteristics, and analysed the group details one by one. I compared the results gained from the analyses of the students' questionnaires with those gained from the sport leaders' questionnaires. I separated the responses having similarities and those showing differences. Then I made comparisons according to gender and location (capital vs. provinces). Firstly, I examined the student's self-assessment data regarding their own physical conditions and grouped them by institutions and by gender (Figure 1). The responses of the students of the research universities were also analysed separately. I also sought to spot the potential deviations between the self-assessments of students pursuing sports and of those inactive in sports. Likewise, I was interested to find out whether there are differences between the self-assessments of women and men students. The respondents used a seven point Likert scale to assess their own levels. Most of them marked level 4, which means that they seem to have a positive opinion of their own physical condition rather than a negative one. There is a higher number of them judging their physical condition to be excellent, than the number of those not satisfied with their own condition.

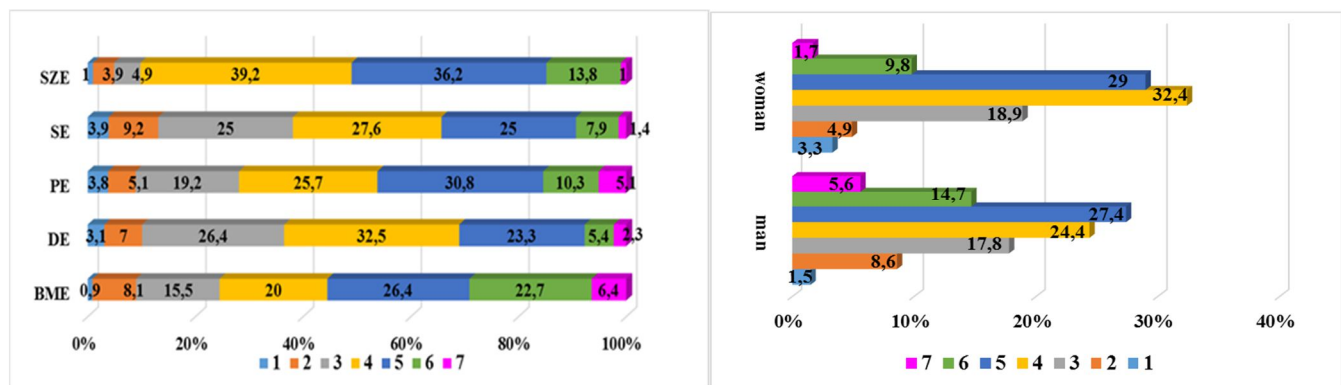


Figure 1: Self-assessment of students' physical condition (% by institution and gender), 2015 (1=not satisfied, 7= highly satisfied)

Source: own research, 2016 (n=441)

The most satisfied are the students of the BME and SZE, while the least satisfied are the students of SE and DE. Of these, BME has the highest number of satisfied students. Ninety percent of the SZE students evaluated their satisfaction level four or even a higher level than that. These results seem to contradict to the literature sources finding that the physical condition of the students is declining; very few of them are pursuing sports on a regular basis (SZABÓ, 2006; PERÉNYI, 2013).

The physical condition has a close correlation with body weight. A survey made by the Tárki (INTERNET 10) reveals that people tend to have a significantly more favourable subjective opinion of their own body weight than their measured actual weight is (BMI scale). 65 percent of the Hungarian people consider their body weights normal, actually, however, only 40 percent fall in this category. 26 percent think they are overweight, the relevant statistical measurement figure, however is 53 percent (INTERNET 10). The data in my research are self-assessed subjective ones, no objective measurements were made. As regards the data distribution by gender, women tend to be more satisfied with their physical condition than men; a higher percentage of men, though, marked levels six or seven on the scale. Less than one percent of women claim to be fully satisfied with their own physical condition.

I looked at the above data against the sporting habits of the respondents, and found that those pursuing no sport at all tend to be less satisfied with their physical condition than their counterparts (Figure 2).

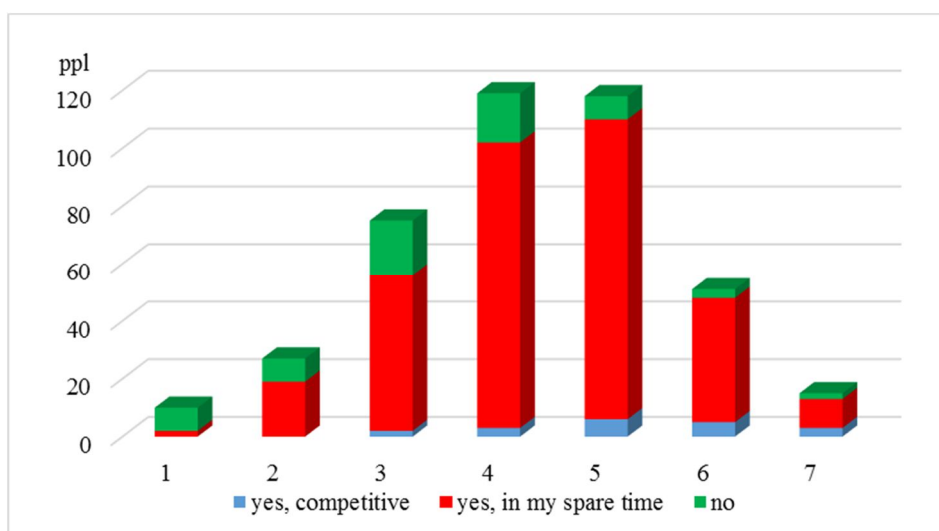


Figure 2: Students' satisfaction with their physical condition vs, sporting habits (2015)

Source: own research, 2016 (n=441)

The most satisfied of the respondents are those pursuing competitive sports, they evaluate themselves mostly levels five and six. Next are those engaging in recreational sports, their self evaluation of satisfaction is level four and five. Level one is mostly marked by those who are inactive in sport; 21 respondents of those marking level two, however, claim that they are doing some kind of recreational sport. 27 percent of the respondents marking levels one, two and three claim that they are dissatisfied rather than satisfied with their physical condition, one third of them are not engaging in sport activities at all.

I was interested to see which sports are the most popular among the members of the sample population. I compared therefore the proportion of those pursuing sport on on-campus with the proportion of those doing sport on off-campus sites, and analyzed the motives of their choices. I investigated the causes of neglecting/quitting sport, I was specifically keen to identify the primary causes of inactivity.

The data in Table 3 indicate a high level of sporting activity among the students: 84 percent of the respondents engage in competitive or recreational sports. The results also reinforce the assumption that sporting activity is in close relationship with age, qualification and schooling (NEULINGER, 2007).

Table 3: Sporting habits (proportional distribution, 2015)

Sporting level	Total	Man	Woman
competitive level	5%	52,2%	47,8%
hobby level	79%	47,1%	52,9%
don't do sport	16%	35,2%	64,8%

Source: own research, 2015 (n=455)

The proportion of 84 percent of activity among the students is a more favourable value compared to the survey results by EUROBAROMÉTER (2014) showing that as low as 38 percent of the Hungarian adult population are pursuing sport at least once a week. An international survey by HAASE (2004) reveals that at least 21 percent of the sample population of tertiary students in 23 countries does not engage in sports whatsoever. According to the findings of the survey, the proportion of the active students is the highest in the north-western countries, whereas it reduces in the Mediterranean (30 percent), in Asia (34 percent) and in the developing countries (35 percent). 75 percent of the students in Eastern-Central Europe do sports on a regular or quasi regular basis (HAASE ET AL., 2004). FÁBRY (2002), however, identifies 33 percent only, and conversely, the survey finds that 79 percent of the students do sports as a hobby. The results are controversial, they contradict to the findings of the 'Youth' large sample survey carried out every four years concluding that 35 percent of the youth sampled in 2012 claimed to be engaging in sports on a regular basis, not counting their PE lessons at school (ÁDÁM ET AL., 2013).

My survey results of the research universities correlate with the respective percentage ratios of a survey carried out at the Corvinus University (SZABÓ, 2004, 2006, 2013), but are different from those reported by a survey of students at DE where a significantly lower proportion of students are reported to be active in recreational sports (KOVÁCS, 2011). Sporting activities tend to differ in

terms of level and mode mostly. Five percent of the students of the sample population do competitive sports, and 79 percent do some kind of sport as a hobby. To be fair, though, several side factors must be considered too. The responses do not provide information on the details of the level of the competitive sport in concern, thus the value judgment of the respondents can be questioned. Is playing in the university sport team and participation in the university championships, for example, to be considered as a competitive sporting activity?

Even if the answer to this question is yes, the surveys quite often fail to provide information on the duration of the engagement in the competitive sport in concern. Similarly, it is unclear when the shift from the competitive sport to recreational sport took place? Was it right before or after starting their tertiary studies that the respondents were pursuing (for what length?) and/or gave up active participation in competitive sport? These questions still remain to be answered. Dropout from competitive sports is a commonly accepted, natural implication of human ageing. The data, however point out an underlying tendency: the students are having difficulties with managing the challenge of bringing complete sport into line with their academic studies. The message of this to the academia is that it is very important to provide the conditions of recreational sports within the institutional frames of the colleges and universities given that, as a rule, competitive athletes begin their careers in recreational sports, and, likewise, tend to shift back to recreational sports when their active sports career finishes.

Some earlier researches found that one of the major conditions of engaging in regular recreational sporting activities for people in general is the ease of the availability of the facilities (SZABÓ, 2006). This assumption, however, has not been fully proven by my findings. Twice as many of the respondents are doing sport on off-campus sites then on the campuses (Table 4). As related to the gender, I found that there is a higher percentage of women choosing off-campus sites then men who prefer choosing on-campus facilities. Astonishingly though, the sport leaders in the sample claim that the provisions of recreational sporting facilities on the campuses are fair or even better than that (PFAU, 2014), which is contradictory to my findings shown above.

Table 4: Sites of sporting activities (proportional distribution, 2015)

Do sports on-campus (n=101)			Do sports off- campus (n=216)		
total	man	woman	total	man	woman
31,8%	52,47%	47,53%	68,2%	42,59%	57,41%

Source: own research, 2015

The sport leaders of the tertiary institutions hold that the scope of their recreational sport provisions is fair; this judgment, however has not been proven by the research data of the students survey.

There are changes taking place in the recreational habits of the students, therefore information on the regularity and type of the preferred recreational activities is very important. Proximity of the facilities is not an important aspect, though if the required sports, quality or environment are not available.

I was also looking into the motives behind the students' choices between on-campus and off-campus sporting sites. The respondents were asked to evaluate each of the motives listed to them on a four point Likert scale (1=do not agree, 4=fully agree). I evaluated those questionnaires only that were fully and correctly answered, and used the data to compare the preferences of men and women students (Figure 3).

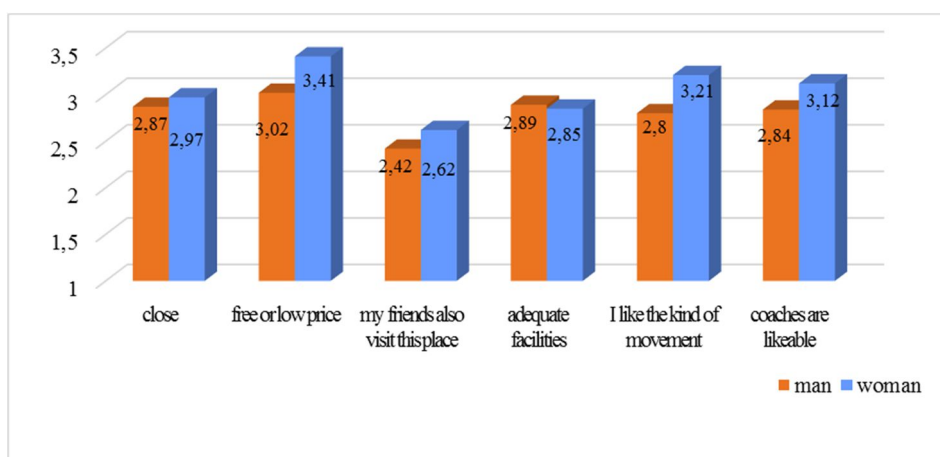


Figure 3: Motives of pursuing sport on-campus (2015)

Source: own research, 2016 (n=79)

The analysis of variance (ANOVA) reveals significant differences between men and women respondents in relation to their value judgments of the motive 'I came to like the type of exercise' (difference of 0,41) with women giving higher average values ($F= 4,181, p=0,044$). Of the motives of pursuing sport on the campus, both men and women voted for motive 'it is free or low price' in the first place, and valued the personality of the coaches in the second place. The paired t-test, however does not show significant differences between the values ($t=-1,703, p=0,090$). The cost aspect seems to be decisive in the site choices preferences of the students, which judgment has to be taken into consideration when designing sporting provisions on campuses. I found that proximity is not a major motive of site preference, which seems to contradict to the results of a survey by SZABÓ (2010). The lowest difference between the value judgments of the students is seen in relation to the motive 'adequate facilities'.

As regards the motives of pursuing sport on off-campus sites, there are no significant differences found between the values of the four motivation options (Figure 4). The highest was valued the

company of friends, which judgment is supported by other literature sources as well (SZABÓ, 2006; NEULINGER, 2007).

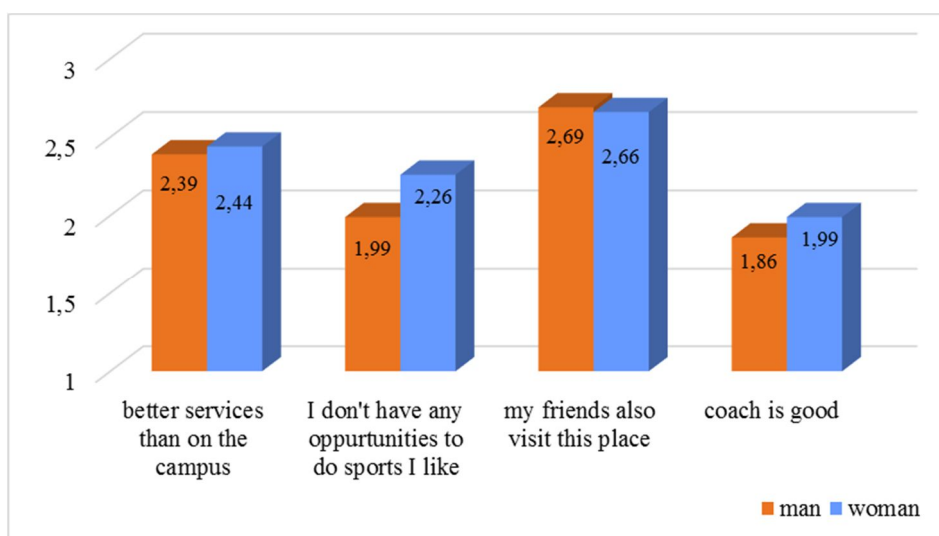


Figure 4: Motives of pursuing sport off-campus (2015)

Source: own research, 2016 (n=188)

Both the essays and in-depth interviews by NEULINGER (2007) and the findings of SZABÓ (2006) indicate that the students are largely influenced by the examples set by their friends active in sport, and that this is found to be an important trigger of revising and changing their attitudes.

The highest are valued by the students the motives 'better services then on the campus' and 'my friends also visit this place' with no significant differences revealed by the paired t-test between them ($t=2,456$, $p=0,64$). The lowest is valued the motive of attachment to the coach, the probable reason for this being that the students tend to do sports on an independent basis not relying on the assistance of coaches. The evaluation average of the motive 'better services then on the campus' is approximating the value level 'I agree'.

Some of the literature sources also point it out that doing recreational sport on an individual basis is gaining popularity with women, which may be an indication of the lack of company (SZABÓ, 2006; NEULINGER, 2007). A research carried out among university students in Budapest arrived at a similar conclusion. For women, the most important trigger of pursuing recreational sport is that of preserving their figure, whereas for men it is the company of friends, competing and triumphing (INTERNET 11).

I searched the popularity of different sports among the students by a multiple choice survey (Figure 5). In order to avoid a high standard deviation, I classified the types of sport according to their characteristic features. Approximately one half of the active students chose the group of fitness sports incorporating aerobic and body building as their preferences.

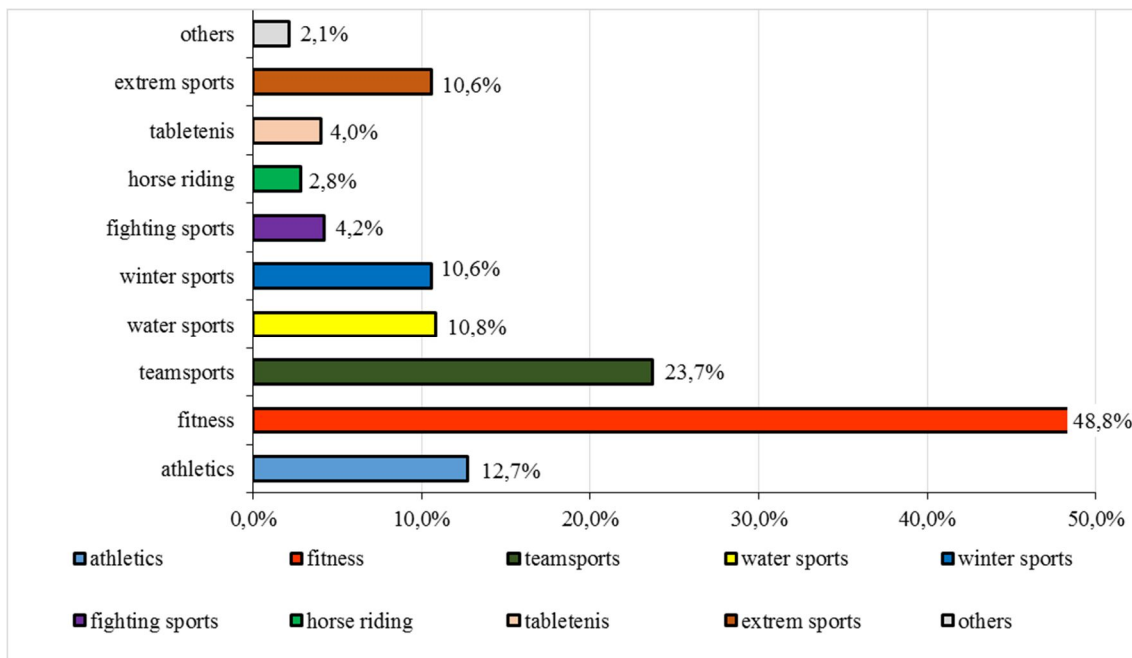


Figure 5: Types of sport pursued by students (multiple choice, 2015)

Source: own research, 2016 (n=316)

Despite the high number of players required, team sport preference was chosen by as many as 23.7 percent of the students. The third most preferred sport is athletics involving running and jogging. The respondents were offered the category 'other' as a response option where most of them named tennis, squash and cycling. The top three preferences of the students in Budapest are running, body building and aerobic, with football taking only the fifth place in the rank (INTERNET 11). The survey results delineate a tendency showing the decline of team sports and the uprise of individual sports among the preferences of the tertiary students. Respective data of the sport leaders' survey show that many universities have their own body building rooms installed to provide easily available and low price sporting facilities for their students. There are aerobic classes and several artificial grass playgrounds, football grounds among others, also provided on-campus by each of the universities asked.

I carried out the crosstab analysis of the data and found significant differences between the sporting habits of the men and women students, which indicate a correlation between gender and sport preference. The correlation has been proven in relation to team sports ($p=0,001$), fitness sport ($p=0,024$), combat sports ($p=0,024$), and extreme sports ($p=0,001$). The correlation was also proven by other respective surveys (SZABÓ, 2006; HAASE ET AL., 2004).

In my research I was also collecting and analysing data on the causes of neglecting/quitting sport (Figure 6). The students involved in the query were given a list of potential causes and were asked to evaluate them. I ranked the averages of the evaluations and drew conclusions concerning the

significance of the individual responses. Only those of the students were asked here, who are not engaging sporting activities.

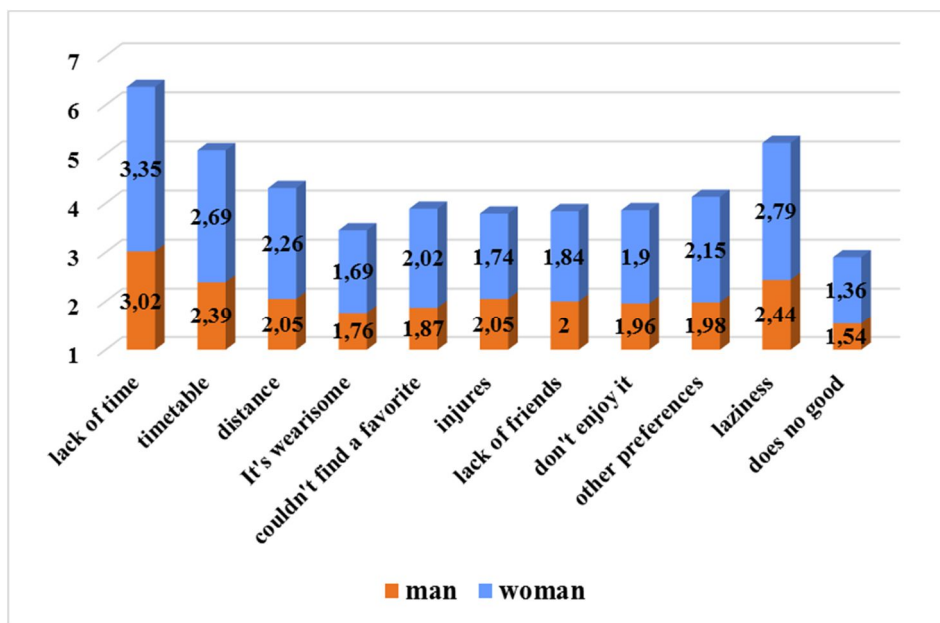


Figure 6: Average values of the reasons for neglecting/quitting sport by students, 2015 (1-I disagree, 4-I absolutely agree)

Source: own research, 2016 (n=221)

The students of the research university sample univocally named the lack of time as the primary cause of their inactivity in sport (3,02; 3,35), which can only be accepted with a pinch of salt, because it turns out that they do have free time but spend it doing activities other than sport.

Laziness, as the third of the most important causes named, indicates a sense of self criticism by the students. These students, at least, do not blame their environment and the conditions for their own inactivity. There is an agreement with the sport leaders in this respect: they think that laziness is the primary reason for students not involving in sport. Study commitments and time table constraints are also listed by the students among the decisive causes, especially so with women students who consider them to be the primary cause. It is a good thing, though, that uselessness of physical activity is ranked last in the list, with a significant difference in relation to gender, though ($p=0,049$).

I was interested to reveal the general attitude of the students to sport, so I made up a questioner with eleven statements for the students to evaluate on the Likert scale. The general conclusion from the responses is that the students agree in that sport is a useful and important activity primarily for its health benefits. This is a general opinion of theirs, no matter whether the respondents are pursuing sports or are inactive. I analysed the responses according to their value content by classifying them into two groups with the help of a list of variables: evaluations involving positive,

and evaluations having negative messages (Table 5). The evaluations containing messages like 'sport is a useful activity', 'it has important health benefits', 'everybody can benefit from sports', 'sport has positive impacts' and 'sporting activity is associated with pleasure'. I classified the rest of the variables as evaluations with negative messages. The variables then were analysed according to gender and residence (capital and country)

Table 5: Positive and negative evaluations of sporting activity (2015)

	man (sd)	woman (sd)	t-test	students of capital universities (sd)	students of the provinces universities (sd)	t-test
positive	3,59(0,45)	3,65(0,36)	-1,65	3,66(0,42)	3,60(0,41)	1,47
negative	1,93(0,50)	1,88(0,46)	-1,22	1,88(0,48)	1,92(0,49)	-0,93

Source: own development, 2016, n=560

The results of the independent sample t-test of the two groups show correlations between the evaluations of the respondents. The evaluations of the tertiary students of universities in the capital and in the provinces do not show significant deviations, or the occasional differences are only immaterial. In sum, they have named similar opinions of the positive and negative implications of sport. Sporting activity as source of pleasure has very high values with women students (3, 65).

I surveyed the recreational sporting facilities provided by the sample universities with a view to spotlighting those of the activities for which the facilities are present. I also investigated the satisfaction of the sport leaders and the students with the sport services. I used the results of the survey to delineate my recommendations on the improvement of the recreational sport services at the tertiary institutions so they can attract more students. I analysed the responses of the sport leaders and the students, and drew comparisons between them. To my best knowledge, no similar researches have been carried out so far, so there are no literature sources available as references. The sport leaders were asked to evaluate the recreational sport services at their institutions on a four point Likert scale. The majority (51 percent) of the respondents consider the services very good (Figure 7), 89 percent think that the recreational sport services are fair or even better than that. Only as low as 11 percent – respondents at the Budapest universities – judge that the provided alternatives are poor.

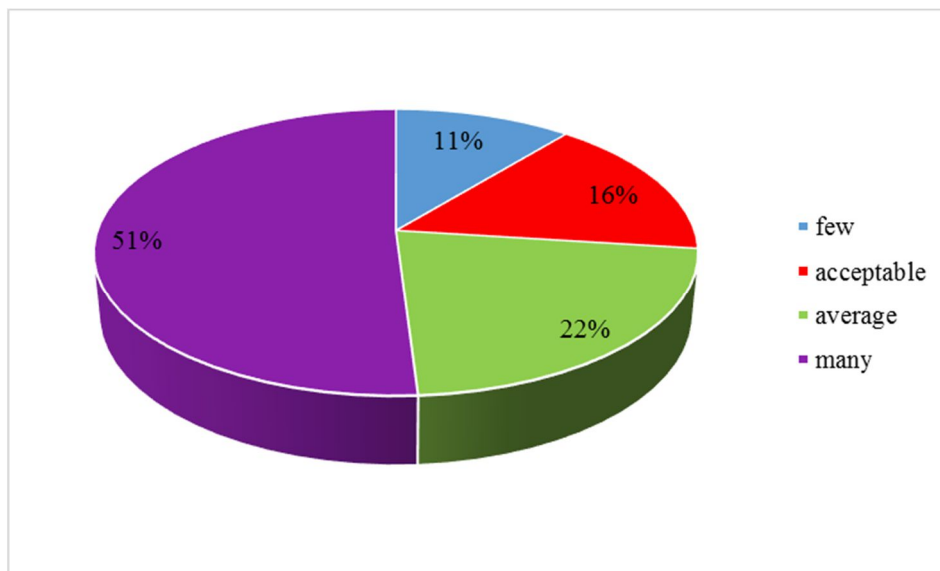


Figure 7: Evaluation of the sport services by the sport leaders (2015)

Source: own development, 2016 (n=42)

The survey of the student sample reveals that more than 75 percent of the students are familiar with the sporting possibilities at their institutions, and that more than 60 percent are using the recreational services provided there. These results are in tune with the general findings. The findings, yet, show that the university campuses are not among the most popular sites of sport, more students are pursuing sport on off-campus sites than on the campuses. The reason for this can be the poor availability of the sport facilities. Also, there is an inadequate regularity of weekly occasions; it is the recreational possibilities that are better used instead. Another problem is probably set by the narrow range of the specialization lines of the PE instructors, which causes that many of the students' requirements remain unfulfilled.

The universities provide both free and fee-paying recreational sport services. I set up three types of recreational services and analysed each of them: weekly occasions, events, championships. I differentiated the regular weekly occasions from the weeks- or months-long quasi-competition series of championships. The events as a rule provide day or half-a-day long recreational occasions. Each university of the sample is providing sport services on-campus free-of-charge, University of Szeged, however, is providing free sporting possibilities off-campus, too. Except University of Szeged, three of the universities provide recreational sport services similar to each other regarding the type of sport. University of Debrecen is notable for providing the widest range of free services, whereas University of Szeged and University of Technology and Economics of Budapest are noteworthy for their most diverse range of fee-paying services. The Students' Self Governments are taking active part in the organization of the regular weekly recreational sporting occasions. Except for one institution, both the coaching and professional responsibilities of the recreational

services of the universities are managed by the PE instructors. If certain services are not available free-of-charge but there is a student demand seen for them, the universities include them in their fee-paying portfolios. The five universities of the sample are common in providing the following range of recreational sports free-of-charge: athletics, basketball, handball, combat sports, football, volleyball, tennis, swimming, spinning, floor ball, horse-riding, wall-climbing and body building. Given that the budgetary constraints of the universities set a limit to the number of provisions, the free-of-charge services are complemented by a much wider range of fee-paying services.

In an earlier research of mine I surveyed the sport infrastructure of the universities in terms of the availability of the indoor and outdoor facilities (PFAU, 2014). In the questioner I included those sports that are usually considered to have solid infrastructural backgrounds. Except for one, the institutions claimed that they provide free services in recreational sports listed to them. I could also use the data collected here for the evaluation and comparison of the recreational sport services provided by the universities in the capital city and in the provincial cities (Figure 8).

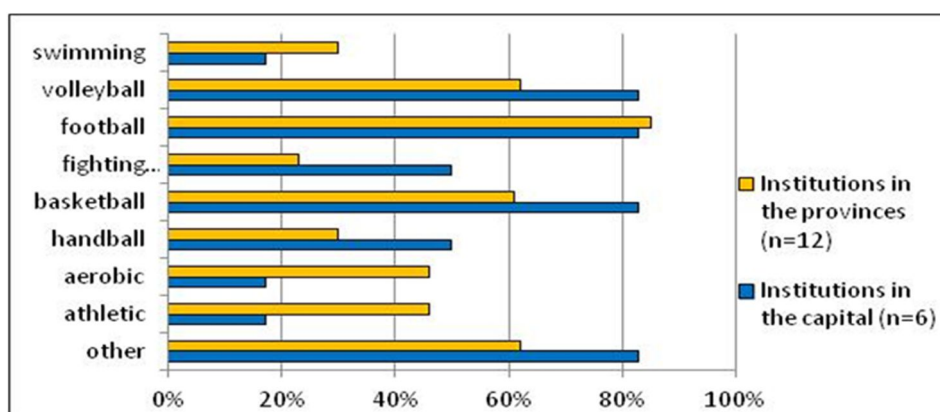


Figure 8: Free-of-charge recreational sport services by the institutions in the capital city and in the provincial cities (2015)

Source: own development, 2014

The institutions in the provincial cities stand out with their high proportion of free-of-charge provisions in athletics and aerobic. Conversely, the combat sports make out 50 percent of the free services of the capital city institutions. The option 'other' was named by 83 percent of the sport leaders in the capital and by 62 percent in the provincial cities.

The institutions in the capital tend to provide a wider range of services to their students than the institutions in the provinces do. This is probably due to the differences of their infrastructural backgrounds.

Another conclusion drawn from the comparative analysis of the free and fee-paying recreational services is that swimming seems to be provided only within the fee-paying scheme by fifty percent

of the institutions (Figure 9). The reason for this, again, is to be seen in the infrastructural conditions, i.e. only few of the institutions can afford to have their own swimming pools. For all the abundance of free-of-charge provisions in football, there is a high demand seen for fee-paying football championships and other events. The fans of individual sports are offered mostly fee-paying options in combat sports.

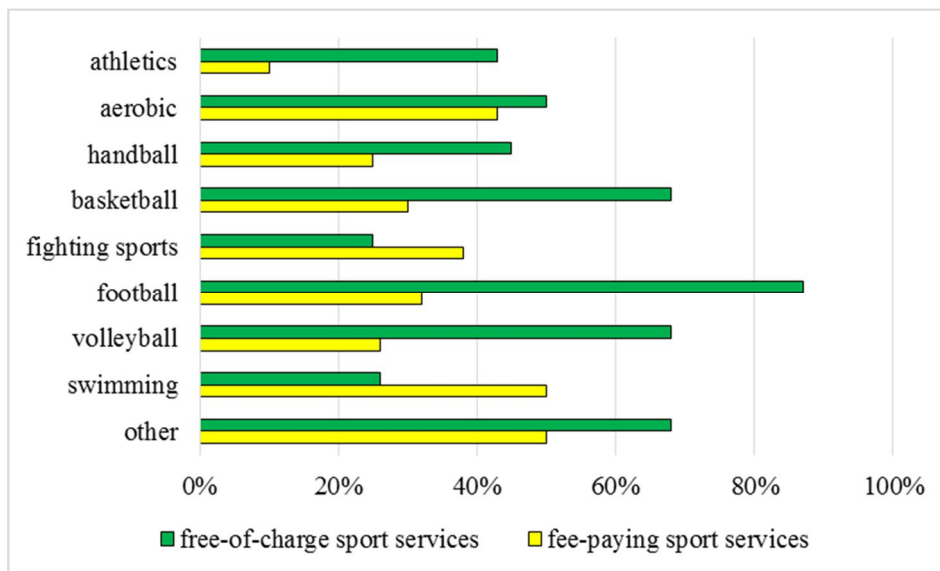


Figure 9: Comparison of the free-of-charge and fee-paying recreational sport services by the sample institutions (proportional distribution, 2015)

Source: own development, 2016

The reason for this is that only few of the PE instructors employed by the institutions have relevant qualifications, and the institutions have to hire qualified trainers to be able to provide the service. The distribution of free and fee-paying options in aerobic are almost leveled, 50 and 43 percent, respectively. Given that this is a very popular type of recreational sport, it is important to provide its availability by the students within organized frames. Due to its low infrastructural requirements, athletic sports are provided free-of-charge by the tertiary institutions.

In the survey I was enquiring about the considerations influencing the students' choice between the different recreational sport services (Figure 10). The respondents were asked to choose from among eight options: the highest proportion of the students value option „the exercise should not be tiresome” the least important consideration. This seems to be quite logical, given that doing exercises requires physical efforts as a matter of course. Intensity and duration, however, can significantly influence the efficiency of the effort and, consequently, the measure of fatigue too. Women consider good atmosphere to be a decisive factor, whereas men think that the quality of the service is the most important consideration influencing their choices.

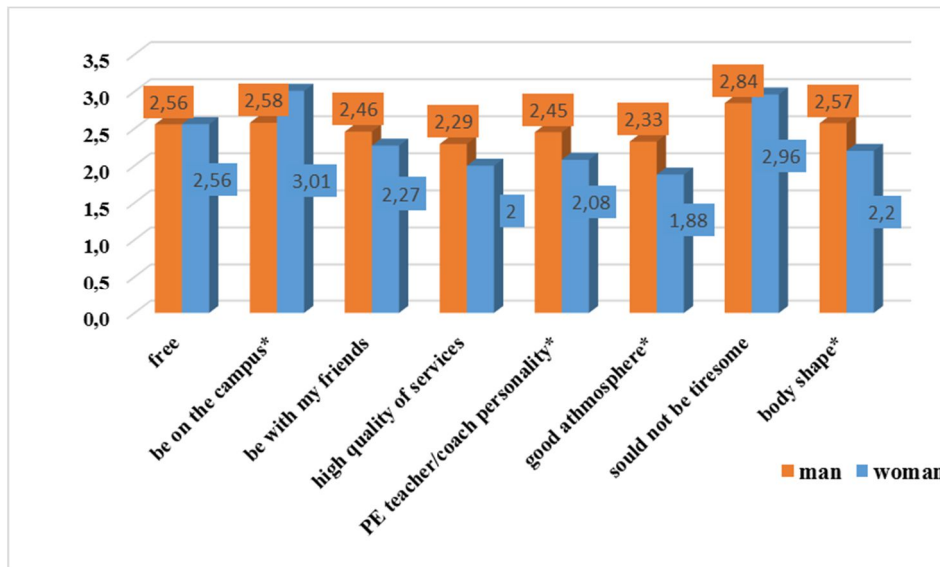


Figure 10: Considerations influencing the choice of the students between recreational sport options, 2015 (1=very important, 4=not important)

Source: own development, 2016 (n=456)

The ANOVA analysis of the responses identified several deviations between the considerations of men and women students.

There were significant differences found between the responses of men and women students concerning the following consideration options: „the service should be available on-campus” ($F=21,623$; $p=0,001$), „it should be high quality” ($F=6,234$; $p=0,013$), „the personality of the coach” ($F=14,240$; $p=0,001$), „good atmosphere” ($F=13,835$; $p=0,001$) and „the exercises should improve my body shape” ($F=8,135$; $p=0,005$).

I also examined the quality of the recreational sport services. Given that sport services are part of the service industry, they are operated and managed according to the rules of the market. This also means that the tertiary institutions in many cases have to compete for their students with competitors in the sport service market. The QSport-10 scale generally used to evaluate the quality of the sport services applies only two aspects of analysis: personnel and facilities. It leaves out the very important aspect of organized programs which is a cardinal component of the tertiary recreational sport provisions. Many acknowledge the importance of such programs in triggering the students’ interest for sport, shaping their attitudes and raising their satisfaction. (YILDIZ – KARA, 2012). In my research I applied the QSport-14 scale of measurement instead which uses three aspects of service evaluation: academic staff, infrastructure and facilities, and sport programs (YILDIZ – KARA, 2012). I adapted the scale to the specificities of the academic environment (Table 6). The comparison of the averages of the three indicators leads us to the conclusion that the

students have positive rather than negative opinions of the academic staff and the sport programs, whereas they seem to be dissatisfied rather than satisfied with the infrastructure.

Table 6: Evaluation of the tertiary recreational sport services, 2015 (average (s.d.))

	total	man	woman	students of capital universities	students of the provinces universities
academic staff	2,17 (0,79)	2,19 (0,79)	2,14 (0,76)	2,15 (0,86)**	2,18 (0,74)
sports facilities	2,30 (0,78)	2,17 (0,84)	2,36 (0,71)*	2,16 (0,92)**	2,39 (0,66)
sport programs	2,19 (0,81)	2,24 (0,81)	2,13 (0,77)	2,20 (0,88)	2,19 (0,76)

*= significant deviations from the men sample, **= significant deviation from the provincial tertiary student sample

Source: own research, 2016

I compared the averages of the indicators in relation to gender and the location of the institution (capital - province), and found significant deviations concerning the academic staff ($F=9,199$, $p=0,003$) and the facilities ($F=33,734$, $p=0,001$).

The results show that the students of the tertiary institutions in the provincial cities are dissatisfied rather than satisfied with the infrastructural conditions there, which is an indication of the inadequate quantity and quality of the facilities.

The t-test indicates a significant deviation between men and women students evaluations in terms of the infrastructure ($F=8,296$; $p=0,004$). The comparatively higher ratio of dissatisfaction among women seems to be rehearsing the general attitude of women students concerning the site of activity, i.e. as pointed out earlier, they tend to prefer off-campus sites anyway. Women students are more demanding of the hygienic conditions, too. It remains to be revealed to what extent do the current tertiary environments meet the requirements of their women students for the high standards of recreational sport services. The present service facilities may more or less satisfy the requirements of the men students, and they seem to be more active in self-initiatives too.

I was also enquiring about the suggestions of the respondents on the prospective improvements of the recreational sport services. This is important to know, because one of the most precious objectives of the tertiary educational policy is to involve an increasing number of students in sports. I constructed the questioner on the basis of my experiences, and incorporated in it the changes having taken place recently. I investigated the suggestions made by both the sport leaders and the students (Figure 11). The comparison of the responses reveals that only two of the suggestion options are considered more important by the sport leaders than by the students.

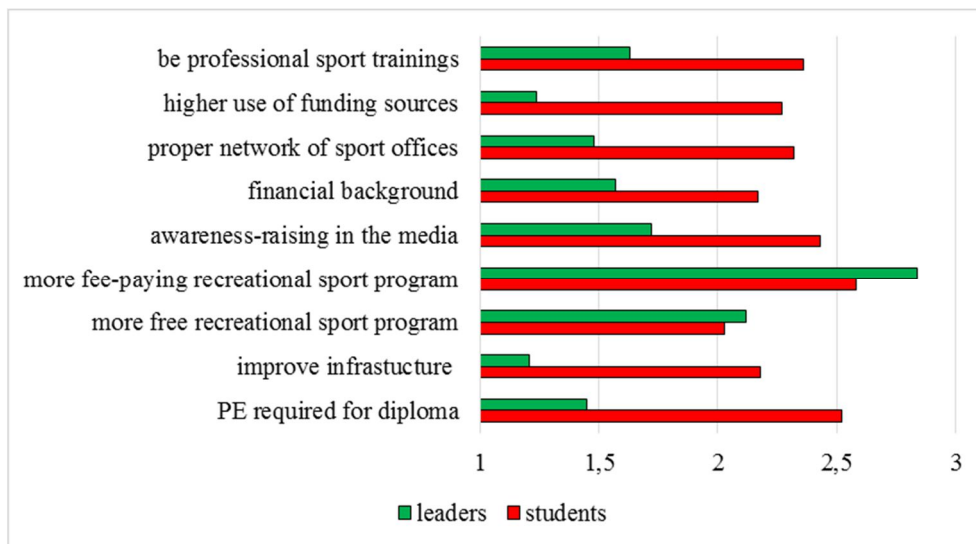


Figure 11: Suggestions on the improvement of the tertiary recreational sport services, 2015 (sport leaders and students: 1 – very important, 4 – not important)

Source: own research, 2016 (n=42, n=540)

As it is reflected by the average values, the students do not seem to make marked differences between the importance of the suggestions, the sport leaders, in contrast, have firm views on the importance of the individual suggestions. Regarding the option „more free recreational sport programs are needed”, though, the two populations seem to share opinions very close to each other (2,03; 2,12). They both think it crucial in advancing the tertiary recreational sport services. Sport leaders consider that improving the infrastructure and making use of funding resources are essential conditions of success in the future. (1, 21; 1,24). Indeed, many of the tertiary institutions have recently been upgraded and improved due to funding sources. Neither of the two survey populations believe that the volume of fee-paying recreational sport services should be increased (2,58; 2,84).

I produced the correlation analysis of the students’ questioners to determine the characteristics of the linear relationships between the variables (Table 7).

The closer the relationship between two variables, the closer the absolute value of the correlation coefficient approximates value one. My analysis revealed positive relationships between the variables in each of the cases. There was a medium close relationship found between the variables of „infrastructure development” and „more free recreational sport services are needed” (linear correlation coefficient 0,566), whereas the relationship between „proper network of sport offices” and „higher use of funding sources” was found to be close ($r=0,604$).

**Table 7: Linear correlation analysis (r= correlation coefficient), 2015
(What changes do you think are required to take place
in the tertiary recreational services?)**

	PE required for diploma	improve infrastructure	more free recreational sport program	more fee-paying recreational sport program	awareness-raising in the media	financial background	proper network of sport offices	higher use of funding sources	be more professional sport trainings
PE required for diploma	x	0,228**	0,169**	0,182**	0,201**	0,146**	0,216**	0,161**	0,209**
improve infrastructure	0,228**	x	0,566**	0,091	0,293**	0,47**	0,33**	0,339**	0,248**
more free recreational sport program	0,169**	0,566**	x	0,04	0,283**	0,443**	0,395**	0,401**	0,326**
more fee-paying recreational sport program	0,182**	0,091	0,04	x	0,172**	0,069	0,069	0,075	0,106*
awareness-raising in the media	0,201**	0,293**	0,283**	0,172**	x	0,321**	0,385**	0,326**	0,293**
financial background	0,146**	0,47**	0,443**	0,069	0,321**	x	0,487**	0,394**	0,305**
proper network of sport offices	0,216**	0,33**	0,395**	0,069	0,385**	0,487**	x	0,604**	0,457**
higher use of funding sources	0,161**	0,339**	0,401**	0,075	0,326**	0,394**	0,604**	x	0,538**
be more professional sport trainings	0,209**	0,248**	0,326**	0,106*	0,293**	0,305**	0,457**	0,538**	x

Source: own research, 2016; $p < 0,01$ **, $p < 0,05$ *

The probable reason for the latter data can be that the costs of the implementation of the sport offices network had been covered by external funds, and the offices now seem to require the involvement of additional resources to keep operating.

I analysed the organizational structure of two universities (DE, BME) by the case study research method. The two universities seem to have their budgetary policies similar to each other in terms of sport financing. The University of Debrecen, though, is unique in that it has „supporting recreational sport activities” declared in its Charter of Foundation.

It is the Coordination Institute of Sport Sciences (SKI) responsible at DE for coordinating and operating the sport activities on-campus and the sport activities with external partners. Also, it engages in the advancement of sport science and physical education. At the Faculty of Technology and Economics of BME sport related responsibilities are managed by the Centre of Physical Education.

Given the large size of both institutions, the organization of the sport activities and the coordination of the activities of several faculties and sport clubs are a fairly complex matter. PE education at the

institutions has three types of responsibilities to fulfill in providing: education (PE classes), recreational sports and competitive sports services. According to its Financial Regulation, BME is operating the subsystem called Physical Education and Sport within which the Faculty of Science and the Directorate of Sport and Recreational Sport Facilities are operating special functions (SSZLI).

The outstanding standard of the sport infrastructure at both institutions meets the expectations of the students. Recreational sport services at DE are commonly coordinated by the SKI and the Student Self Government (HÖK). The universities are providing both free-of-charge and fee-paying recreational sport services. They both provide 39 types of individual and team sports. The sport associations of the universities (MAFC, DEAC) are granted certain advantages in return for their contribution to the organization of recreational sport services.

The sport related expenditures of the universities are the following:

3. Labour costs,
4. Facilities maintenance,
5. Development, investments,
6. Organization of events,
7. Competitions in the university colours.

The recreational sport events are budgeted by the university and HÖK resources. The costs of competitive sports are financed by the university associations and the BME TK/DE SKI jointly.

4. NOVEL RESULTS OF THE RESEARCH

The research involves the students of five research universities. I carried out the comparative analysis of the responses by the students sampled at the capital city and provincial universities.

I applied the novel approaches of multi-aspect analysis of the conditions and organizational framework of the recreational sports at the tertiary level. I analysed the responses by the students and the sport leaders in parallel, and developed questioners suited for the comparative analysis of the responses of the two populations. No similar comparative research of the sport leader-student population has been carried out yet.

My research analyses of the location specific preferences, financial background, infrastructure and organizational framework of the tertiary recreational sports provide novel information and outcomes feasible for practical use.

I extended the questioner survey of the sport leaders and students to 18 tertiary institutions in Hungary. I applied specific statistical methods in order to facilitate multi-aspect analyses and data structuring.

I analysed the structure and operation of two research universities with the case study research method. The novel outcomes of the research can help other tertiary institutions with determining and implementing their own sport strategies.

5. PRACTICAL FEASIBILITY OF THE RESULTS

Thanks to some additional contributions by funding sources, sport has gained a major importance in the advancement of tertiary education. The organizational structure of the recreational sports has also been affected by these changes. In order to be able to provide state of the art sport facilities and services, the tertiary institutions must have a research based clear picture of the requirements of their students.

My survey of the students' physical condition shows that the students of the sample tend to have positive rather than negative opinions of their own physical status. This is a general assumption of theirs irrespective of the geographical location of their institutions: the students of universities in the capital and in the provinces share this same opinion. Those of them, however, who are inactive in sport, are less satisfied with their physical condition than those pursuing sports. My general impression is that the students seem to evaluate their condition higher than it actually is. Therefore I recommend involving them in sport activities such that bring them face to face with their real physical shapes. The University of Debrecen helps the students gain a realistic picture of their own conditions by organizing health check occasions for them once every semester.

The survey of the sporting habits of the students of five research universities allowed for drawing several conclusions. I found that 79 percent of the sampled students do some kind of sport in their free time on a regular basis, which suggests that the academic environment may trigger their activity. The analysis of their sport preferences shows that their preferences are very much influenced by their material backgrounds. The provision of free-of-charge or fair price on-campus recreational sport services is therefore a very important issue.

I analysed the popularity of different types of sport and found that the individual sports are growing in popularity as compared to the team sports. Aerobic, conditioning training and body building are leading the preferences list both among men and women students. I also found significant differences between the sport preferences of men and women students and a correlation between gender and sport preference. The correlation has been proven for team, fitness, combat, and extreme sports. This is an important and useful piece of feed-back information for those designing and organizing recreational sport services.

I surveyed the circle of those organizations and people who are responsible for the organization and supervision of free-of-charge recreational sport services at the tertiary level. The responses of the sport leaders reveal that such services are organized by the PE instructors, the Students' Self Government (HÖK), the sport offices and the sport associations. I found that this system is operated

up to the standard, and the cooperation between the HÖK and the respective organizational units is adequate.

The most preferred of the free-of-charge services is football, nevertheless, there has been demand registered for the organization of fee-paying football championships and events as well. The requirement for free-of-charge and fee-paying aerobic services are almost leveled (50 and 43 percent, respectively). Given its high popularity, this sport has to be made available within organized frames. Due to its low requirement for infrastructure, athletics are generally provided free-of-charge by the institutions.

The average results of the survey of satisfaction with the quality of the sport infrastructure show that the sample population of the provincial tertiary institutions is dissatisfied rather than satisfied with their infrastructures. The overall conclusion drawn from the responses of the sport leaders and the students is that the sport facilities at the tertiary institutions fail to meet the requirements of high standard recreational sport provisions yet. There are, however examples of well adjusted, advanced level recreational sport services too.

I demonstrated it in case studies that the sport infrastructure and organizational structure of two selected tertiary institutions are representing outstandingly high standards. The responsibilities of the organizational units of the two sample institutions are similar, the ways of implementation, though, are different. Both of the institutions keep updating and improving their recreational sport services and are keeping them in tune with the student's expectations. The organizational units of the institutions are operated in a transparent fashion; they are setting good examples for other institutions to follow.

6. LIST OF PUBLICATIONS IN CONCERN

Foreign language journals:

PFAU CHRISTA (2015): Analysis Of The Leisure Sport Activities In University Of Debrecen. Abstract – Applied Studies in Agribusiness and Commerce Epub. Vol.9. Num.1 -2. pp 75-81.

PFAU CHRISTA (2015): Examination Of Leisure Sports Alternatives Provided By Higher Education Institution. Abstract – Applied Studies in Agribusiness and Commerce Vol.9. Num.3. pp 33-39.

Hungarian language scientific journals with summaries in a foreign language

PFAU CHRISTA (2016): Hallgatói szabadidősport szervezése és jellemzői a felsőoktatásban. Taylor: Gazdálkodás- és Szervezéstudományi folyóirat: a Virtuális Intézet Közép-Európa Kutatására Közleményei 4, Szeged: pp. 5 -16. (ISSN 2064-4361)

PFAU C. – DOMOKOS SZ. (2016): Szabadidősport a felsőoktatásban. Taylor: Gazdálkodás- és Szervezéstudományi folyóirat: a Virtuális Intézet Közép-Európa Kutatására Közleményei 2, Szeged: pp. 111-118. (ISSN 2064-4361)

PFAU CHRISTA (2014): Egyetemisták szabadidősport szokásai a Debreceni Egyetem Agrártudományi Központjában. Agrártudományi Közlemények = Acta Agraria Debreceniensis 58: pp. 155-163. (ISSN 1587-1282)

PFAU CHRISTA (2014): Szabadidősport és sportinfrastruktúra összehasonlító elemzése a kutató egyetemeken. Taylor: Gazdálkodás- és Szervezéstudományi folyóirat: a Virtuális Intézet Közép-Európa Kutatására Közleményei 1-2, Szeged: pp. 413-423. (ISSN 2064-4361)

PFAU CHRISTA (2014): Szabadidősport lehetőségek és sportolási szokások vizsgálata a Debreceni Egyetemen. In: Bartusné Szmodis Márta (szerk.) Sporttudomány az egészség és teljesítmény szolgálatában: XI. Országos Sporttudományi Kongresszus. Magyar Sporttudományi Szemle 15. évfolyam 58. száma. Konferencia helye, ideje: Debrecen, Magyarország, 2014.06.05-2014.06.07. (Magyar Sporttudományi Társaság) Budapest: Magyar Sporttudományi Társaság, p. 52.

PFAU CHRISTA (2013): A szabadidősport tevékenység összehasonlító elemzése a felsőoktatásban. In: Perényi Szilvia (szerk.) Ifjúsági Sport és Tehetséggondozás – „A 21. Század Kihívásai „: konferencia kötet, Debreceni Egyetem Gazdálkodási és Vidékfejlesztési Kar. pp. 268-275. (ISBN:978-615-5183-81-2)



Registry number:
Subject:

DEENK/35/2017.PL
PhD Publikációs Lista

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List of publications related to the dissertation

Articles, studies (6)

1. **Pfau, C.:** Hallgatói szabadidősport szervezése és jellemzői a felsőoktatásban.
Taylor 8 (4), 5-15, 2016. ISSN: 2064-4361.
2. **Pfau, C., Domokos, S.:** Szabadidősport a felsőoktatásban.
Taylor 8 (2), 111-118, 2016. ISSN: 2064-4361.
3. **Pfau, C.:** Analysis of the leisure sport activities in University of Debrecen.
Apstract 9 (1-2), 75-80, 2015. ISSN: 1789-221X.
DOI: <http://dx.doi.org/10.19041/APSTRACT/2015/1-2/14>
4. **Pfau, C.:** Examination of leisure sports alternatives provided by higher education institution.
Apstract. 9 (3), 33-39, 2015. EISSN: 1789-221X.
DOI: <http://dx.doi.org/10.19041/APSTRACT/2015/3/5>
5. **Pfau, C.:** Egyetemisták szabadidősport szokásai a Debreceni Egyetem Agrártudományi Központjában.
Agrártudományi Közlemények = Acta agraria Debreceniensis 58, 155-162, 2014. ISSN: 1587-1282.
6. **Pfau, C.:** Szabadidősport és sportinfrastruktúra összehasonlító elemzése a kutató egyetemeken.
Taylor 6 (1-2), 413-423, 2014. ISSN: 2064-4361.





Conference presentations (2)

7. **Pfau, C.:** Szabadidősport lehetőségek és sportolási szokások vizsgálata a Debreceni Egyetemen.
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In: "Ifjúsági sport és tehetséggondozás - a 21. század kihívásai" : II. Nemzetközi Turizmus és Sportmenedzsment Konferencia : Debrecen, 2012. szeptember 5-6. : konferencia kötet.
Szerk.: Perényi Szilvia, Debreceni Egyetem GVK, Debrecen, 268-275, 2013. ISBN:
9786155183812

The Candidate's publication data submitted to the iDEa Tudóstér have been validated by DEENK on the basis of Web of Science, Scopus and Journal Citation Report (Impact Factor) databases.

23 February, 2017

