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INDIVIDUAL MANAGEMENT OF PHYSICAL ACTIVITY OF TOURISM AND RECREATION STUDENTS THROUGH MOBILE APPLICATIONS

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Abstract

Introduction. The impact of mobile applications on the physical activity of Tourism and Recreation students in Krakow has not been the subject of in-depth research so far. The aim of this study is to identify the areas of management, scope of use and motivation for using mobile applications during physical activity by students of Tourism and Recreation. The theoretical framework for motivation analysis is the Achievement Goal Theory. **Material and methods.** A quantitative approach was adopted, surveys were conducted among students of Tourism and Recreation in Krakow. The basic parameters of descriptive statistics, coefficient of variation V , and correlation coefficients were calculated. **Results.** Students of Tourism and Recreation use mobile applications while running, cycling and aerobics. The most important functionalities for students are those that support processes of controlling the performance of their physical activity. The results show that, with regard to the Achievement Goal Theory, stronger motivation comes from aspects falling into the Goal category. **Conclusions.** In the theoretical aspect, the results deepened the understanding of the processes of individual management of students' physical activity; in the methodological aspect, they allowed the researchers to conclude that the Achievement Goal Theory is suitable for analysing the motivation to use mobile applications during physical activity, while in the practical aspect, the results indicated the possibility of improving the quality of students' physical activity through individual management with the efficient use of mobile applications.

Key words: physical activity management, Tourism and Recreation students, mobile applications, Achievement Goal Theory

Introduction

Physical activity in the appropriate intensity and time is a factor determining health and quality of life [1, 2]. The expectations towards students of Tourism and Recreation to undertake proper and efficient physical activity are high. On the one hand, during their adolescence, students build their fitness and shape, the foundations of their future lifestyle [3]. On the other hand, as part of their professional activities, alumni can influence the behaviour, motivations and attitudes of others with regard to physical activity [4]. Identifying the level and quality of physical activity of Tourism and Recreation students, and the factors determining it, is therefore an important research area from a cognitive and practical point of view. Previous research included pupils' physical activity [5], physical activity of students in general [6, 7], including Physical Education students [8, 9]. To the author's best knowledge, no research has been conducted on students of Tourism and Recreation so far; therefore, this research fills the existing gap.

One of the determinants of students' behaviour in all dimensions of life is mobile applications [5]. However, the significance of applications is closely related to how they are used. It can be assumed that they will have a positive impact on physical activity if they are used in a conscious, planned way aimed at achieving a specific goal. Thus, such a process can be classified as students' management of their physical activity, using, among others, tools such as mobile applications. Management is an extremely broad conceptual category. Focusing on its classic functions [10], i.e. Planning, Organizing, Commanding, Coordinating, and Controlling, in the case of individual management we can distinguish planning, organizing, motivating and controlling processes [11]. This research attempts to identify the

above processes while using fitness applications. The willingness to examine their impact on the physical activity of Tourism and Recreation students was another reason for choosing this topic.

The Achievement Goal Theory formulated by Nicholls was adopted as the theoretical framework in the analysis of motivations [12]. The theory specifies two distinctive achievement goals: task (mastery), and ego (performance) [13]. A task-oriented person is usually internally motivated and tries to reach the aim the best way possible. Self-assessment of achievement is often based on normative guidelines [13]. There is a focus on effort and improvement [14]. Ego (performance) goals reflect competence perception relative to the performance of others [15]. This theory seems particularly appropriate for exploring student motivation, because it was created and initially applied in educational aspects, and recently it has been used mainly in relation to sport and physical activity [16]. Mobile applications are tools that support the achievement of both types of goals: task-oriented by setting normative limits of achievement, and ego-oriented goals, by presenting the achievements and evaluations of others.

The aim of the article is to evaluate the management of physical activity through the use of mobile applications by students of Tourism and Recreation at selected Krakow universities.

Specific goals include:

1. Assessment of the extent to which Tourism and Recreation students use mobile applications during physical activity.
2. Identification of the differences in the use of mobile applications by respondents during physical activity depending on the form and level of study.

3. Assessment of the frequency of using the applications during physical activity of Tourism and Recreation students in Krakow.
4. Identification of processes of students' physical activity management through mobile applications.
5. Assessment of the implementation of mastery and performance goals in the physical activity of Tourism and Recreation students.

The following hypotheses were formulated:

- H1: Support of mobile applications in the process of managing students' individual physical activity occurs primarily in controlling processes.
- H2: Students' motivation to support physical activity through mobile applications results from the desire to achieve mastery.

Material and methods

After in-depth literature analyses, an original survey questionnaire consisting of 10 questions concerning mobile applications used in physical activity was prepared in order to explore students' behaviour and approach regarding supporting physical activity with mobile applications.

When constructing the questionnaire, reference was made to the tools previously used in the literature of the subject. Thus, reference was made to the questionnaire used by: Conroy, Yang & Maher [17], Kranz et al. [18] and Lim & Noh [19], which was adapted for this study.

After preparing the initial version of the questionnaire, pilot studies were conducted with 10 experts in the field of recreational and sports activities, with extensive experience in the use of modern technologies supporting physical activity, including mobile applications. After introducing appropriate corrections, the main research was conducted at universities.

The sample consisted of students of Tourism and Recreation studying in Krakow. Making the effort to ensure the reliability and validity of the results, the survey was carried out on a purposive sample. To ensure the representativeness of the results, statistical requirements were met for the correctness of the sample selection in terms of its size and composition. The size of the general population was estimated at 980 students.

The research team from the Department of Tourism of the Krakow University of Economics contacted lecturers representing different universities in Krakow, asking for a permission to conduct the study during their lectures. Some barriers were encountered, including a lack of consent from teachers, or a lack of willingness of students to participate in the research, numerous administrative procedures, and reference to the General Data Protection Regulation. As a result, the research was carried out at four universities: the AGH University in Krakow, the Academy of Physical Education in Krakow, the University of Economics in Krakow and the Pedagogical University [the current name is: University of the National Education Commission] in Krakow. The survey was conducted using an electronic version of the questionnaire created on Google.

Students were informed about the purpose of the research, the voluntary nature of their participation, and the possibility of resigning at any time. During the classes, when conducting the research had been agreed with the teacher, students were asked to complete a survey questionnaire using their mobile devices. During the survey, a research team member was always present in the classroom to answer questions asked by the respondents (regarding the correctness of completing the questionnaire), and to ensure its proper conduct. Ultimately, 677 completed questionnaires were collected. It should be mentioned that despite

the impossibility of surveying all Tourism and Recreation students in Krakow, the research sample obtained constituted over half of the total population.

The completed surveys were first verified for their formal correctness (completeness of the answers provided). As a result of this stage, the final number of data subject to analysis was reduced and amounted to $n = 457$ records.

The description of the sample is: 70% females; 75% bachelor students, 85% full-time students, assessing their financial situation as: Very bad (2%), Rather bad (3%), Average (38%), Rather good (50%), Very good (8%).

The collected research material was processed using commonly used statistical methods. The basic parameters of descriptive statistics were calculated: arithmetic mean, standard deviation, minima and maxima, coefficient of variation V . In addition, chi-square tests of independence were additionally performed for selected issues, and Pearson's correlation coefficients were calculated. Statistical analysis was performed using Statistica 9 and Microsoft Excel software.

Results

The research results indicate that over $\frac{3}{4}$ of the students (79%) of Tourism and Recreation in Krakow use mobile applications during sports and recreational activities. The percentage of full-time students using mobile applications to support physical activity is higher than part-time students (84% and 74%, respectively). 78% of bachelor students and 88% of master students use mobile fitness applications.

The main forms of physical activity during which mobile applications are used are presented in Table 1.

Table 1. Main forms of physical activity during which mobile applications are used

Activities	%
Jogging	36.14
Cycling	24.01
Aerobics	21.53
Swimming	3.71
Walking	3.22
Roller skating	2.48
Horseback riding	1.24
Trekking	1.24
Others	5.23

Applications are most often used by students during jogging, cycling and aerobics. Only a few percent of the surveyed population use them when carrying out other activities.

The results concerning frequency of use of mobile applications supporting physical activity are presented in Table 2.

Table 2. Frequency of use of mobile applications supporting physical activity

Frequency of use of mobile applications supporting physical activity	%
at least once a day	21.7
several times a week	36.9
several times a month	30.7
once every few months	10.7

Table 3. Percentage of respondents expressing evaluations of the functionality of mobile applications

	Low (very low +low significance (%))	Medium (%)	High (high +very high significance (%))	Mean	Standard Deviation
Provide instruction on how to perform activity	27	20	53	3.42	1.32
Provide feedback on performance	19	19	62	3.69	1.26
Plan social support/change	66	16	18	2.16	1.24
Information about others' approval (likes)	70	14	16	2.05	1.24
Set training goals	13	16	71	3.93	1.11
Review of training goals	20	27	53	3.47	1.17
Allow comparisons with others	59	20	21	2.41	1.28
Review of (achieved) training results	11	12	77	4.13	1.07
Set graded tasks	28	24	48	3.29	1.23
Provide information on where and when to perform the activity	33	25	42	3.12	1.30
Current monitoring of results	10	8	82	4.29	1.03

Scale: 1-5, 1 – not important, 5 – very important.

Students typically use fitness applications several times per week or several times per month. This group constitutes over 58% of the students. Only every tenth student uses mobile applications to support physical activity once per several months.

The percentage of respondents expressing evaluations of the functionality of mobile applications on the scale from 1 (not important) to 5 (very important) is presented in Table 3. The scale was finally reduced to three intervals: high significance of the chosen functionalities (comprising answers: very high and high), medium and low (comprising answers: very low+low).

For students, the most important functionalities are Monitoring of current training results and Analysis of training results. Functionalities related to Comparing themselves with others and Obtaining the opinions of others were assigned less importance.

The purposes of using mobile applications during physical activity are shown in Table 4.

Table 4. Purpose of using mobile applications during physical activity

The aim of using mobile applications during physical activity	%
Collecting/saving data	58
Improvement of training effects	30
Comparing oneself to other users of a given app (in private mode)	7.5
Sharing results with friends in the friends network	2.9
Others (sharing results in public domain via the web app)	2.5

When answering the question concerning the aim of using applications, students mainly mentioned Gathering data and Improving the training results. The percentage of students indicating goals related to Comparing their results with the results of others did not exceed 8%, and Sharing their results did not exceed 3% of the surveyed group.

Students also expressed their willingness to use mobile applications to support their physical activity in the future. The highest rating (on a scale of 1-5) was 4.02 given to readiness to use the application in the future.

Discussion

The results indicate that the behaviour of Tourism and Recreation students studying in Krakow regarding the use of applications during recreation is similar to students in other countries, like the Netherlands, Germany or the USA [20, 21, 22]. Applications are a widely recognized tool supporting physical activity [23].

Application usage among the surveyed students is relatively high, although compared to e.g. Dutch students, it is slightly lower [24]. This indicates a potential for wider application usage. It seems advisable because the physical activity of students in Krakow, e.g. those from Krakow University of Economics, is not sufficient in comparison to the standards of the American College of Sports Medicine [25]. The higher frequency of use of dedicated applications provides a chance to improve students' results in this area. However, the most important thing is the efficiency of using the application, that is why we focused on this issue.

The results of international research to date indicate that students try to consciously manage their physical activity [26]. To assess this issue among students of Tourism and Recreation at universities in Krakow, the analysis of the management process was conducted. Individual functionalities of the applications can be assigned functions performed in the general process of management. It can be assumed that the individual physical activity management supported by mobile applications comprises processes typical for management, such as planning, organizing, motivating and controlling. Thus, the **planning** process is supported by: *Setting training goals, Reviewing training goals, Setting graded tasks*; **organizing** is supported by: *Providing instructions on how to properly perform a given physical activity and Providing knowledge about where and when to exercise*; **motivating** by: *Planning support from social media, Allowing comparisons with others and Information about the approval of others (likes)*, while **controlling** by: *Current monitoring of results; Review of training results (achieved) and Providing feedback on the results obtained*. The analysis of the results indicates that the functionalities supporting the control of physical activity are the highest rated functionalities of individual physical activity management. The average grade of the three functionalities connected with the process of controlling is 2.6 (on the scale 1-3) while the average grade of applications' functionalities necessary for planning is 2.4, for organizing 2.2 and for motivations 1.5. These findings

support H1: *Support of mobile applications in the process of managing students' individual physical activity occurs primarily in controlling processes.* Fitness applications, having built-in algorithms for assessing the achievements, after being personalized by the owner of the mobile device on which they are installed, allow her/him to assess the quality level of the completed activity. The surveyed students attached the highest importance to this functionality. Results are consistent with those regarding the American youths [14], for whom the possibility of control was also crucial.

The analysis of the evaluation of applications' functionalities supporting four management sub-processes (planning, organizing, motivating, controlling) was carried out to investigate how the functionalities of applications support the whole individual management processes. Some students were identified whose evaluations indicated 'high significance' ratings for at least one functionality supporting each sub-process of individual physical activity management. Among the students who evaluated all functionalities of the applications, (with missing responses excluded), 22% declared that the importance of functionalities enabling the implementation of all management processes is high. This reveals that fewer than 1/4 of the respondents consciously manage their exercises when using the applications during physical activity. There is a correlation, albeit weak ($r = 0.51$), between assigning high significance to functionalities enabling the implementation of the physical activity management processes, and the frequency of the application use. Among students who attributed high significance to the functionalities enabling each of the 4 physical activity management processes, 42% use the application at least several times a week. It should be stated that students who consciously manage their physical activity through applications use the application for this purpose at least several times a week.

Confirming the importance of mobile applications' controlling function for the respondents is a significant finding. It reveals the willingness of the surveyed students to effectively manage their physical activity towards achieving mastery, in line with the Achievement Goal Theory. This approach is also confirmed by other research results regarding the purpose of using the application [18]. From the stated reasons for using the application for physical activity, motivation can be deduced. Referring to the Achievement Goal Theory, the vast majority of the surveyed Tourism and Recreation students from Krakow used mobile applications to achieve goals that fell into the mastery category (such as: Improvement of training effects – 30%, Collecting data – 58%). Goals that could be considered as ego goals (like *Comparing oneself to other users of a given app* (in private mode) or *Sharing results with friends in the friends' network*) were indicated by only a small percentage of the respondents (7% and 3%, respectively). This demonstrates that Tourism and Recreation students use the application with the goal of achieving the intended outcomes of their physical activity. These findings support H2: *Students' motivation to support physical activity through mobile applications results from the desire to achieve mastery.* The differences between the percentage of students indicating goals that are classified as task goals are significantly different from the group indicating ego goals.

Conclusions

- Mobile applications are commonly used by students of Tourism and Recreation at the surveyed Krakow universities. This indicates their potential for improving the quality of physical activity.

- The fact that students attach high importance to the functionalities of applications that allow them to consciously pursue their own physical activity can be considered a process of managing it. The applications are used for the following processes of physical activity management: planning, organizing, motivating and controlling. However, such a complete approach is represented by less than 1/4 of the surveyed students, which suggests a significant area for improvement. This is an indication to emphasize even more the issue of the quality of physical activity in the Tourism and Recreation curriculum.
- The correlation between the physical activity management process and the frequency of using mobile applications proves the importance of applications for the effective management of physical activity of Tourism and Recreation students.
- The most important fitness applications' functionality for students of Tourism and Recreation is the functionality that supports the process of controlling the performance of their physical activity. This is an important managerial implication for fitness applications' producers and sellers, indicating which functionalities to improve and how to promote products.
- Students' motivations to use mobile applications during physical activity are based on the pursuit of mastery, which refers to the Achievement Goal Theory. The Achievement Goal Theory can be applied to create the theoretical framework for the exploration of motivation for physical activity performed with mobile applications.

Research limitations

The research was conducted solely at selected universities in Krakow that offer Tourism and Recreation studies. It is advisable to repeat the research to observe changes over time, and especially by including students from all Krakow universities. It is also worth conducting research on a nationwide sample of students studying Tourism and Recreation.

It would also be interesting to compare the results with students of other fields of study to assess whether the learning outcomes for the field may have an impact on students' management of their physical activity.

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