

## THE IMPACT OF SPORTS AND RECREATION ACTIVITIES ON THE PHYSICAL DEVELOPMENT AND HEALTH OF SCHOOLCHILDREN AND STUDENTS

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**Abstract:** The article explores the scientific viewpoints on the contribution and benefits of sports and recreation activities in educational institutions for every schoolchild or student. At the time of the coronavirus and digitalization, any form of physical activity is helpful for people of all ages, including schoolchildren and students. As this study demonstrates, every form of physical activity helps to strengthen the body and improve academic performance. Furthermore, the authors have shown that sports and recreation activities in educational institutions at the school and university stages contribute to the improvement of students' health, as well as their physical and psychological development.

**Keywords:** sports and recreation activities, schoolchildren's health, students' health, educational institutions, academic performance, influence factors

### 1 Introduction

Physical activity throughout life is a part of modern human's adequate healthy behavior. It applies to the level of physical activity that contributes to strengthening health at all stages of life. Educational institutions can influence students' physical activity levels through sports and recreation activities. Moreover, this influence should be effective not only during the attendance of respective institutions but also positively impact the formation of habits related to physical activity throughout life. Given the increasing prevalence of overweight and related health issues due to a sedentary lifestyle, forming a habit of physical activity throughout life has become a crucial societal problem that should be addressed from a very young age.

The significance of the effects of sports and recreation activities on health is a central theme in sports pedagogy (Horn & Basic, 2017; Neuber, 2011). It is quite surprising that educational institutions, as educational environments, and physical education subjects, as particular sports organizations, have received little attention so far. Therefore, the authors consider the study of the importance of sports and recreation activities for health and, consequently, academic success to have great potential for analyzing socially relevant issues in the field of education.

As a pedagogical activity, sport, in general, creates many different opportunities for learning, education, and development. They can have a positive impact on both interdisciplinary skill development and personal development (Krueger & Neuber, 2011). Especially in childhood and adolescence, a large part of academic success is attributed to sports (Cornelissen & Pfeiffer, 2016; Pfeiffer & Cornelissen, 2010). In addition to numerous theoretical proposals that describe and discuss sports and recreation activities in their true pedagogical qualities, numerous empirical studies indicate that physical activity in children, adolescents, and adults fundamentally positively affects development processes (Conzelmann & Schmidt, 2020; Gogoll, 2014). Particularly in the school environment, sports events also contribute to fulfilling interdisciplinary learning requirements (Heim & Brettschneider, 2002).

If we look at the scientific discourse on the relationship between sports and health activities in the educational process and health, it becomes evident that, to date, the main topics were the school

as an institution and school sports as a pedagogical field (for a review, see Fischer, Meier, Poweleit & Ruin, 2017). However, approaches that empirically investigate sports activities beyond the curriculum regarding their positive influence on physical health are increasingly emerging (Brandl-Bredenbeck, 2010; Overwien, 2010). It includes informal sports events and clubs (e.g., Hansen, 2016; Mueller, 2017).

Nevertheless, it is unlikely that there has been a systematic and theoretical investigation of the functions of sports and recreation activities in an educational institution such as a university. It is even more surprising since university sports play a central role in organizing sports programs and, sometimes, due to legitimacy reasons, bear increasing responsibility for providing medical services to students (Goering, 2018). Furthermore, there are relatively few empirical studies regarding student sports' direct and indirect educational effects. It mainly applies to the connection between sports, academic achievements, and health.

### 2 Aims

1. To identify the importance of sports and recreational activities, physical activity, academic success, and health.
2. To determine the impact of sports and recreation activities on schoolchildren and students' physical development and health.

### 3 Literature Review

The authors will develop a conceptual framework for a systematic and multidimensional analysis of the key issue of the connection between sports and recreation activities, academic success, and student's health. The health of the education seeker as a research subject does not require additional definitions. Instead, the approaches to defining academic performance among scientists are marked by high volatility. Notably, after introducing the so-called Bologna Process in the mid-2000s, research interest in determinants and predictors of academic success has increased. Although academic performance studies may draw on extensive empirical knowledge, a systematic approach to academic success can sometimes be challenging. It is primarily due to different approaches to the question of the aims and functions of degrees and the associated issue of operational success. Consequently, it is unsurprising that there is still no singular and precise definition of academic success (Heinze, 2018; Heller, 2012; Konegen-Grenier, 2002).

Mainly, empirically-oriented research on academic performance, not devoid of preconditions but associated, especially in Germany, with relatively straightforward theoretical assumptions about the university as an educational institution and its function in higher education (Altbach, 2016; Huether & Kruecken, 2016; Teichler, 2016). The search for decisive predictors of academic success, its model-theoretical integration, and health status appear to be moving in tandem with the need for education policy formation in models of control linked to academic success (Berthold & Leichsenring, 2007; Bogumil & Heinze, 2009). In particular, heightened attention to comparative degrees during the Bologna Process has made academic success a formal indicator of educational system quality. The designation of academic success as an essential benchmark value in education policy has also shifted research perspectives towards a more efficiency-oriented determination of concepts of academic success. Thus, the overall discourse on the development of empirical university research as an educational science focused on the efficiency and performance of specific educational institutions is also inherent in academic success research (Bornkessel, 2018).

Against this background, Stebler (2000) divides the discourse into various prospective views on education, which is considered a crucial phase of both education and life. Research success is

built as a dependent target variable, including institutional market and individual-subjective perspectives. This differentiation indicates that academic success can be interpreted differently depending on the respective viewpoints. While more institutionally formed research approaches focus on the efficiency of the education system and question predictors of formal learning success, market-oriented research is based on variants of further education in the job market (Bornkessel, 2018). From the perspective of institutional-market research, academic success and attrition (indirectly) are understood as complementary phenomena. In this regard, academic success is typically operationalized through indicators such as final grades, dropout rates, or duration of study (van Buer, 2011).

On the other hand, individual-subjective views on academic success pay attention to personal attributes, the value, and the quality of the experience of the respective studies becoming the subject of research. This research approach mainly gives more significance to the subjective definition of the situation under investigation. For instance, the relevant criteria and parameters here include:

- acquisition and expansion of professional and interdisciplinary skills;
- student satisfaction;
- achievement of individual learning goals;
- individual problem-solving;
- personal development (Koenig & Richter, 2019).

The topic of academic performance is gaining increasing attention. Despite the complexity of the term and numerous subsequent proposals that offer subjective access to the subject (Blomeke, 2009; Rindermann & Oubaid, 1999), the following works dominate among a range of studies. Mainly, the statistical characteristics of grades have been the focus of many studies as a criterion for academic success (Giese, Otte & Stoetzer, 2013). Only recently, other promising views on academic success have been proposed, starting with the year of study, thus primarily considering the quality of the learning process (Koenig & Richter, 2019). It is particularly evident in a series of works considering different research phases (Biermann et al., 2017). Based on theoretical assumptions (Esser, 2002), the research advocates for broader inclusion of subjective views on learning success within comprehensive concepts of educational success research (Krempkow, 2008; Schultes & Schroeder, 2013). These assumptions seemingly provide objective boundary conditions of social situations, such as if academic achievements are to be classified and appropriately evaluated in the context of experience and actions.

Previous conceptual models for explaining educational success are typically based on the culmination of numerous empirical findings. They usually perceive academic success as an event associated with multiple causes, primarily moderated by learning behavior (Ruffing, 2016). The predictors identified and discussed concerning academic success are highly diverse and can be attributed to various spheres. If following Bluethmann's (2012, 2014) model of academic success, educational behavior (e.g., learning experience and learning behavior) will depend on educational conditions (e.g., teaching quality or module design), life conditions (e.g., family status or financial resources), and admission requirements (e.g., motivation to learn, grades for admission qualifications to educational institutions).

Kuh, Kinzie, Buckley, Bridges, and Hayek (2006) assert something similar: the model combines both process and structural variables and focuses on the learning experience (prior level). They are considered highly relevant for institutional-market and subjective-individual educational success indicators. In addition to admission requirements ("pre-entry experience"), educational conditions ("institutional conditions") and specific life conditions of students are also considered central structural conditions (Kuh et al., 2006; Kuh, Kinzie, Schuh, & Whitt, 2011).

Conversely, Tinto (1993), who significantly shapes the international discourse on academic success and student satisfaction, prefers an approach that asks about the conditions of students' integration in education and, therefore, is more process-oriented. In this model, the program's success depends mainly on proper integration at the initial stage. Consequently, this approach considers structural framework conditions at the beginning of the year particularly important.

Against this backdrop, the theoretical-conceptual deficit becomes evident when considering the discourse on sports and recreation activities, academic achievements, and health status. There is a lack of integrative models that would link the findings with each other and general conceptual frameworks that would enable systematic and theoretical empirical research in the subject area. In the context of the following conceptual considerations regarding sports and recreation activities, academic success, and health status, the authors will explore the potential of sports-scientific discussion for the discourse on academic success, health status and outline central research perspectives.

#### 4 Theoretical Background

Considering the diversity of models and findings related to academic achievement, numerous further propositions can be made for analyzing (potential) relationships between sports and recreation activities, academic success, and health. A differentiated study of the multidimensional constructs of academic success, sports, recreational activities, and health is fundamental to the following conceptual discussions.

Beginning with the concept of academic achievement, two main perspectives for investigating connections can be derived:

- the possible impact of sports and recreation activities on formal successful completion of degrees (e.g., final grades);
- the courses which align with expectations (e.g., adhering to standard study periods, low quit rates, high student satisfaction).

This concept includes both institutional-market and individual-subjective dimensions.

Forrester (2015) demonstrates, for instance, that the impact of sports and recreational activities on the tendency to quit college before graduation and without a diploma has an inverse relationship. Henchy (2011) also describes participation in university sports as a satisfaction factor during studies. Thereby, sports are an indirect predictor of successful degree attainment. Huesmann, Brown, Lee, Kellogg, and Radcliffe (2007, 2009) also show a compensatory relationship between engaging in sports and recreational activities related to health and average academic performance. It was corroborated in the works by Keating, Castelli & Ayers (2013). Moreover, Cornelissen & Pfeiffer (2010, 2016) indicate the connection between participation in sports and recreation activities, health, and career success. They illustrate that acquired sports skills correlate with later health status and earned income.

Secondly, the potential relevance of sports and physical exercises can be established from the following perspectives:

- individual acquisition of specialized knowledge;
- interdisciplinary skills;
- personal development (e.g., health skills, self-efficacy, social skills).

If academic performance is conceptualized not only as the final course outcome, then, thirdly, the dimensions of academic performance can also be observed in terms of successfully overcoming challenges at course stages (such as enrollment or graduation).

The systematic review of the relationship between sports and recreation activities, academic performance, and health also

requires consideration of the multidimensional concept of sports and recreation activities. These connections can only be accurately determined if the phenomenon of "sport" becomes available for a differentiated observation. For the context of educational institutions and organizational units, it is appropriate to make a fundamental distinction between physical (everyday) activity and sports activities. Regarding physical activity, there is also an issue of theoretically plausible differentiation of physical activity forms.

In the university context, it can sometimes be assumed that competition-related activities in team sports may have a different effect than, for example, individual fitness training in the gym, group fitness-oriented workouts, or participation in adventure-oriented outdoor sports competitions. Moreover, many possible "influence models" can be presumed (Schneider & Diehl, 2014). Consequently, it is necessary to differentiate to what extent the attributed effects are isolated physical, psychological, or social effects or whether they constitute more complex biopsychosocial mechanisms.

Regarding research success, it can be hypothesized against this background that sports activities can have both functional and dysfunctional effects on research success or remain relatively inconsequential.

## 5 Results

Based on the above considerations, the following three main arguments can be made to explain the potential link between sports and recreation, academic success, and health:

1. A physically active lifestyle as a means of prevention and health reinforcement facilitates successful academic completion. The health status of students can positively or negatively impact their cognitive abilities, learning behavior, and exam performance. Poor health and prolonged periods of absence due to illness are also associated with a higher likelihood of dropout or non-promotion to the next grade (Huber & Kellner, 2002). As physical exercises, whether in the form of everyday physical activity, fitness training, or sports competitions, have a wide range of health impacts (Jekauc, Reiner & Woll, 2014), an indirect effect on academic achievement can be presumed.
2. From a pathogenetic perspective, the lack of exercise is considered a central risk factor for many clinical patterns. Meanwhile, the preventive functions of a physically active lifestyle and fitness are well-documented (Hillmann & Schott, 2013). Adequate sports activity and physical exercises are regarded as essential preventive measures for mental disorders, particularly among students (Moellenbeck & Goering, 2014). Physical fitness also represents a significant therapeutic intervention for existing health problems, thus aiding better coping with illnesses or injuries (Jetzke, 2019).
3. From a salutogenetic point of view, sports and physically active lifestyles can, for example, be associated with developing or maintaining physical-constitutional, personal, and social-interpersonal or sociocultural resources (Brehm et al., 2013). Overall, engaging in sports and recreation activities impacts health by improving stress-coping abilities and stress regulation. Moreover, the self-realization of health-related activities also depends on the availability of the following psychosocial resources:
  - knowledge;
  - social support;
  - access to healthcare services, etc. (Faltermaier, 2017).

In this context, physical resources that can be managed through sporting activity (improved body awareness or greater physical resilience) can play a central role in coping with stress during the study process or dealing with high-stress episodes before exams. Additionally, depending on the nature of sports activities, there is the potential to expand social support networks or enhance actions and knowledge related to sports and physical exercises.

In addition, sports can also take on a meaningful function and possibly contribute to more significant mental resilience.

The first analysis by Stock (2017) conducted regarding the impact of students' health on their academic success concluded that active and healthy behavior, including physical activity, plays a significant role in formal institutional academic achievement. El Ansari & Stock (2014) came to a similar conclusion, showing that students who adhere to WHO recommendations for physical activity also achieve better academic performance than their peers and are in better physical shape.

In addition to these functionally positive effects of physical activity on health, it is also possible to formulate dysfunctional assumptions about the investigated impact. Participation in sports and recreational activities may also be associated with the following very specific health risks:

- physical overexertion and improper strain;
- typical patterns of sports injuries;
- increased susceptibility to infections.

However, intensive sports training may also contribute to the development of clinical conditions, namely:

- eating disorders and body image issues (Giel et al., 2016);
- exhaustion in students (Granz, Schnell, Mayer, & Thiel, 2019);
- health risks (Mayer & Thiel, 2018).

These potential side effects of intense physical activity also need to be considered in a differentiated health-oriented study of factors relevant to research success.

The increase in cognitive abilities has been discussed as a psychological side effect of sports and recreation activities (Walk, 2011). Accordingly, participation in sports and recreational activities can also be understood as a means to directly improve students' performance, assuming that concentration, memory, or motivation for learning can be enhanced through appropriate exercises. The extent to which, for example, active breaks, fitness training, or sports activities can have a positive impact on academic performance has been researched to a limited extent (Mess, Theune & Schueler, 2015; Schueler, Hildebrand, Barthel & Woll, 2015). The extent to which other expected effects (better mood and biopsychosocial well-being) also affect academic performance still needs to be analyzed more closely.

Co-curricular sporting activities within university sports can promote integration from a social perspective at the beginning of the term. It can lead to a higher level of engagement with the university and contribute to overall student satisfaction through the possible development of social networks. The findings by Goering, Jetzke, and Rudolph (2017) show a positive correlation between physical activity and satisfaction with academic success among German students. Based on Tinto's (1993) research on academic achievement, the integrative potential of playing sports together during learning may be a crucial factor for academic success. In his empirical analysis, Jetzke (2019) provides additional information about the relevance of sports activities for successful social-academic integration and their impact on academic success and health.

However, it should be noted that sports and recreational activities that turn into intense sports activities can also contribute to, for example, less time available to fulfill relevant academic requirements, such as preparing for exams. It can lead to a decrease in the importance of studying or becoming a secondary concern. A special group comprises competitive athletes who move in two performance-oriented social settings as part of a dual career. This group of students needs to meet the expectations of the elite sports world as well as the demands of the academic world through effective time management and resource utilization. It raises questions about the conditions

under which academic and sports achievements are possible and to what extent acquired skills can be transferred between different environments to maintain adequate health levels.

The sports and recreation activities can also be explicitly utilized as educational content to develop skills and contribute indirectly to interdisciplinary skill development. Health-related competence associated with physical activities (Sudeck & Pfeifer, 2016) can be effectively enhanced through well-designed health sports programs. For instance, students' social skills can be addressed through school-oriented team activities, and sports engagement as a central element of a healthy lifestyle could be integrated into studies focusing on key skills. The opportunities to foster both "health literacy" (Nutbeam, 2008) and "physical literacy" (Whitehead, 2001) among schoolchildren and students through sports and health activities are diverse. The extent to which physical activity can contribute to students' self-efficacy, improve self-organizational skills, and influence academic motivation raises questions that require more thorough analysis in the future.

The research on the multidimensional and relational functions of sports activities should be explored. For example, Potuto & O'Hanlon (2006) demonstrated that students' participation in local sports competitions might be associated with lower overall grades on the one hand. On the other hand, it could also have a positive impact on personality development. In addition, it is reasonable to consider the cyclical effects and potential interactions between physical activity, academic success, and health.

## 6 Discussion

Based on the above assumptions about the relationship between physical activity, academic performance, and health, there are further proposals for a differentiated explanation of the main influence factors and generative mechanisms for a holistic analysis of biopsychosocial constellations. These constellations cause specific patterns of sports activity in schoolchildren and students and, therefore, can also affect academic performance through the outlined cause-and-effect relationships, the basic distinction between the personal and social levels.

At the personal level, it is necessary to consider the individual requirements of students who may need various forms of sports activities, namely:

- personal wellbeing;
- body constitution;
- gender-related aspects related to sports;
- motivational structures;
- individual training histories;
- socio-economic backgrounds.

At the social level, apart from general living conditions in educational institutions, it is crucial to focus on the structural peculiarities of schools and universities related to sports and physical exercises. For instance, it can be assumed that the structure of the school or university sports program may influence the students' level of physical activity. The potential impact of these educational structures that promote physical activity on health, cognitive performance, and even academic achievement needs more detailed investigation.

Additionally, it is essential to determine under what conditions sports and recreation activities are suitable as interdisciplinary educational content in educational institutions for promoting health, social, and self-competence and which groups of students will benefit the most from this. Moreover, it is necessary to systematically examine to what extent the curriculum or formal course requirements (e.g., attendance time, examination periods, exam requirements, etc.) may facilitate or hinder students' physical activity.

Furthermore, research is needed on how sports and physical exercise-related infrastructure in educational institutions (e.g.,

availability of walking paths, bicycle lanes, equipped sports facilities, etc.) impact the physical activity of different groups of students. Accordingly, an integrative approach to promoting a certain level of health through physical activity may be located at the three indicated levels:

1. Personal skills and behavior of students.
2. Learning conditions in educational institutions.
3. Living conditions at the place of study.

Furthermore, these initial conceptual considerations on the relationship between sport, exercise, academic success, and health should be extended into an integrative framework model. This framework should allow for a systematic investigation of the relevance of sports activities to different aspects of academic success. It should also address the relevant research on success promotion and learning-related conditions at the personal and social levels.

## 7 Conclusion

Although the relationship between sports and recreational activities and various aspects of academic success and health of schoolchildren and students is reflected in only a small number of research projects to date, the outlined research program on the impact of sports and recreational activities on the physical condition and health of schoolchildren and students looks quite promising. A closer connection with empirical research expands not only the perspective of "sports science" on the importance of sports and exercises but also creates knowledge about the relevance of sports in educational institutions. The importance of sports activities for academic success in universities opens up an attractive research perspective. It can also provide the necessary background knowledge for the legitimacy of sports and recreation activities during a fundamental educational transformation in the educational sphere.

The authors have shown that dealing with the highly complex relationship between sports and recreation, academic achievement, and health is not a problem. However, the research aimed at studying only academic achievements should consider the declared expectations of the educational institution concerning the learning process as a stage of education. Therefore, the analysis can become a driving force for educational policy change and thus influence the institution's development. The fact that the paradigm shift from input control to output control in education in recent years has led to greater attention to the economic aspects of academic performance and health outcomes is largely accepted as a fact in higher education research (Buelow Schramm, 2013; Sagirli, 2014). The increasing number of assessment studies on the effectiveness of learning structures and conditions on physical fitness and health should be seen as a consequence of this development. Although such a research logic seems understandable and plausible, it also supports the tendency of general educational research to define educational processes and their influencing parameters as measurable variables. Thus, it promotes performance-oriented educational optimization (Wolter, 2015).

Suppose the physical condition and health of education learners are no longer based on the level and quality of personal development (i.e., will increasingly be based on performance criteria that are easy to collect and compare). In that case, a sports science research agenda (focusing on academic success and physical health) also becomes a framework that supports this economization of education. The research activity that follows this understanding of academic success will primarily look at the effects and mechanisms of sports activities that aim to support and optimize overall learning ability. In this way, general educational opportunities in sports (based on subjective studies of motor problems and alternative motor self-realization) will be marginalized.

Also, the factors of sports and recreation activities' impact on the health of schoolchildren and students (summarized by the authors of this study) are consistent with the theses by Reinders

(2016). According to them, this research orientation is subject to the optimization requirements of modern educational policy. Therefore, it should also be discussed in sports science expertise of learning outcomes. Moreover, for sports and recreation activities as an institutional factor, the study of their impact on health can have both positive and negative consequences. For the further orientation and the development of sports and recreation activities in educational institutions, a differentiated study of the topic "sports and academic performance and its impact on health" is of central importance. There is an intrinsic value in sports and recreation activities, expressed beyond economic expectations in social debates about movement problems. It finds a place in university sports science research only when traditional humanistic educational ideals and social expectations of young people regarding their health match (Reinders, 2016).

#### Literature:

1. Altbach, P.G. (2016). *Global Perspectives on Higher Education*. Baltimore: Johns Hopkins University Press.
2. Berthold, C., & Leichsenring, H. (2007). University sport and university reforms. In A. Goering & I. Behrens (Eds.), *Farewell to Humboldt? Reform processes at German universities* (pp. 5-13). Goettingen: Goettingen University Press.
3. Biermann, A., Kaub, K., Friedrich, A., Wach, F.-S., Ruffing, S., Reichl, C. et al. (2017). SioS-L - Study on individual and organizational influences on academic success in teacher training. In C. Graesel, & K. Trempler. (eds.), *Development of professionalism in educational staff: Interdisciplinary considerations, findings and perspectives* (pp. 75-92). Wiesbaden: Springer specialist media.
4. Bloemeke, S. (2009). Training and professional success in teaching studies in comparison to diploma studies - on the prognostic validity of cognitive and psycho-motivational selection criteria. *Journal of Educational Science*, 12(1), 82-110.
5. Bluithmann, I. (2012). Individual and study-related influencing factors on the satisfaction of bachelor students. *Journal of Educational Science*, 15(2), 273-303.
6. Bluithmann, I. (2014). Ability to study, satisfaction with studies and dropping out: analyzes of influencing factors in bachelor's degree programs: dissertation, Free University of Berlin.
7. Bogumil, J., & Heinze, R.G. (eds.). (2009). *New control of universities. An interim report*. Berlin: edition sigma. P. Bornkessel. (ed.). (2018). *Success in studies: Concepts, findings, and desiderata*. Bielefeld: W. Bertelsmann Verlag.
8. Brandl-Bredenbeck, H.P. (2010). Movement, education and identity development in childhood and adolescence. In Neuber, N. (ed.), *Informal learning in sport: Contributions to the general education debate* (pp. 117-32), Wiesbaden: VS Verlag for social sciences.
9. Brehm, W., Boes, K., Graf, CH, Hartmann, H., Pahmeier, I., Pfeifer, K. et al. (2013). Sport as a means of prevention, rehabilitation, and health promotion. *Bundesgesundheitsblatt-Gesundheitsforschung Health protection*, 56(10), 1385-1389.
10. Builow-Schramm, M. (ed.). (2013). *Studying successfully under Bologna conditions?: An empirical intervention project on university didactic design*. Bielefeld: W. Bertelsmann Verlag.
11. Conzelmann, A., & Schmidt, M. (2020). Personal development through sport. In J. Schueler, M. Wegner & and H. Plessner (eds.), *Sports Psychology: Fundamentals and Application* (pp. 337-54). Berlin, Heidelberg: Springer.
12. Cornelissen, T., & Pfeifer, C. (2016). Sports and wages. *Review of Economics*, 59(3), 244-255.
13. El Ansari, W., & Stock, C. (2014) Relationship between Attainment of Recommended Physical Activity Guidelines and Academic Achievement: Undergraduate Students in Egypt. *Global Journal of Health Science*, 6(5), 274-283.
14. Esser, H. (2002). *Sociology: social action*. Frankfurt/Main: Campus Verlag.
15. Faltermaier, T. (2017). *Health psychology*. Stuttgart: Kohlhammer Verlag.
16. Fischer, B., Meier, S., Poweleit, A., & Ruin, S. (2017). *Empirical school sport research in dialogue*. Berlin: Logos Verlag.
17. Forrester, S. (2015). Benefits of Collegiate Recreational Sports Participation: Results from the 2013 NASPA Assessment and Knowledge Consortium Study. *Recreational Sports Journal*, 39(1), 2-15.
18. Giel K.E., Hermann-Werner A., Mayer J., Diehl K., Schneider S, Thiel A et al. (2016). Eating disorder pathology in elite adolescent athletes. *International Journal of Eating Disorders*, 49(6), 553-562. doi:10.1002/eat.22511
19. Giese, S., Otte, F., & Stotzer, W. (2013). Einflussfaktoren des Studienerfolges im betriebswirtschaftlichen Studium: Eine empirische Untersuchung. *Jenaer Beitrage zur Wirtschaftsforschung, Heft 1/2013*.
20. Gogoll, A. (2014). The model of sport and movement culture competence and its implications for the task culture in physical education. In Pfitzner, M. (ed.), *Task culture in physical education: Concepts and findings on the discussion of methods for a new learning culture, education, and sport* (pp. 93-110). Wiesbaden: Springer specialist media.
21. Goering, A. (2018). Student health promotion in and through university sports from a real-life perspective - opportunities and challenges. In H.-G. Predel, M. Preuss & G. Rudinger (eds.), *Healthy Campus - University of the Future* (pp. 39-58). Goettingen: V&R unipress.
22. Goering A., Jetzke M., & Rudolph, S. (2017). Student satisfaction - an empirical study on the connection between physical activity and student satisfaction at a German university. *Higher Education*, 4+5, 105-112.
23. Granz, H., Schnell, A., Mayer, J., & Thiel, A. (2019). Risk profiles for athlete burnout in adolescent elite athletes: A classification analysis. *Psychology of Sport and Exercise*, 41, 130-141. doi: 10.1016/j.psychsport.2018.11.005.
24. Hansen, S. (2016). Informal learning and sport. In M. Rohs (ed.), *Handbuch Informelles Learning* (pp. 413-436). Wiesbaden: Springer specialist media.
25. Heim, R., & Brettschneider, W.-D. (2002). Sporting commitment and self-concept development in adolescence. *Journal of Educational Science*, 5(1), 118-138.
26. Heinze, D. (2018). The individual study success. In Heinze, D. (ed.), *The importance of volition for academic success* (pp. 41-65). Wiesbaden: Springer specialist media.
27. Heller, T. (2012). Study today, drop out tomorrow? *Journal of Education and Theology*, 64(4), 361-376.
28. Henchy, A (2011). The Influence of Campus Recreation Beyond the Gym. *Recreational Sports Journal*, 35, 174-181.
29. Hillmann, C., & Schott, N. (2013). The relationship between fitness, cognitive performance, and brain status in school children. *Journal of Sport Psychology*, 20(1), 33-41.
30. Horn, A., & Basic, P. (2017). *Education in Motion: A plea for a holistic understanding of education with special consideration of the physical dimension of education following the project "Preschoolers in motion."* Berlin: Logos Verlag.
31. Huber, G., & Kellner, M. (2020). Study ability as a goal of health management for students. *B&G Movement Therapy and Health Sport*, 36(1), 36-39.
32. Huesmann Jr, R.L., Brown, A.K., Lee, G., Kellogg, J.P., & Radcliffe, PM. (2007). *Modeling Student Academic Success: Does Usage of Campus Recreation Facilities Make a Difference?* Milwaukee: The National Symposium on Student Retention.
33. Huesmann Jr, R., Brown, A. K., Lee, G., Kellogg, J. P., & Radcliffe, P. M. (2009). Gym bags and mortarboards: Is use of campus recreation facilities related to student success? *NASPA journal*, 46(1), 50-71.
34. Huether, O., & Kruecken, G. (2016). The thematic perspective. In O. Huether & G. Kruecken (eds.), *Universities: Questions, results, and perspectives of social science university research, Organization & Public Management* (pp. 63-297). Wiesbaden: Springer specialist media.
35. Jekauc, D., Reiner, M., & Woll, A. (2014). On the connection between sporting activity and habitual health and its direction of effect. In S. Becker (ed.), *Active and healthy? Interdisciplinary perspectives on the connection between sport and health* (pp. 13-30). Wiesbaden: Springer specialist media.
36. Jetzke, M. (2019). Sport and university dropout: A regression analysis on the relevance of social integration. *Sport and Society*, 16(1), 85-111.

37. Keating, X., Castelli, D., & Ayers, S. (2013). Association of Weekly Strength Exercise Frequency and Academic Performance Among Students at a Large University in the United States. *Journal of Strength and Conditioning Research*, 27(7), 1988-1993.
38. Konegen-Grenier, C. (2002). *Ability to study and access to higher education*. Cologne: German Institute publishing house.
39. Koenig, R., & Richter, J. (2019). Academic success and dropout. *Journal of Educational Science*, 22(5), 1267-1275.
40. Krempkow, R. (2008). Study success, study quality, and study ability. An analysis of the determinants of study success in 150 Saxon courses. *The College: Journal of Science and Education*, 17(1), 91-107.
41. Krueger, M., & Neuber, N. (2011). *Education in Sport: Contributions to a contemporary educational debate*. Wiesbaden: VS publishing house for social sciences.
42. Kuh, G.D., Kinzie, J.L., Buckley, J.A., Bridges, B.K., & Hayek, J.C. (2006). *What matters to student success: A review of the literature (Vol. 8)*. Washington, DC: National Postsecondary Education Cooperative.
43. Kuh, G.D., Kinzie, J., Schuh J.H., & Whitt, E.J. (2011). *Student success in college: creating conditions that matter*. Washington, DC: John Wiley & Sons.
44. Mayer, J., & Thiel, A. (2018). Presenteeism in the elite sports workplace: The willingness to compete hurt among German elite handball and track and field athletes. *International Review for the Sociology of Sport*, 53(1), 49-68. doi: 10.1177/1012690216640525.
45. Mess, F., Theune, J., & Schueler, S. (2015). Evaluation and further development of the break express as a measure of outreach health promotion in the university setting. In A. Goering & D. Moellenbeck (eds.), *Exercise-oriented health promotion at universities* (pp. 221-234). Goettingen: Goettingen University Press.
46. Moellenbeck, D., & Goering, A. (2014). Physical Activity, Health Resources, and Student Wellbeing: A Gender Matter? In S. Becker (ed.), *Active and healthy? Interdisciplinary perspectives on the relationship between sport and health* (pp. 449-474). Wiesbaden: Springer specialist media.
47. Mueller, J. (2017). *Identity constructions of marginalized young people in informal sports: A qualitative study on the soccer field*. Opladen: Budrich UniPress.
48. Neuber, N. (2011). Educational potential in child and youth sport - perspectives for a contemporary concept of education. In M. Krueger & N. Neuber (eds.), *Education in Sport: Contributions to a contemporary educational debate* (pp. 143-161). Wiesbaden: VS publishing house for social sciences.
49. Nutbeam, D. (2008). The evolving concept of health literacy. *Social Science & Medicine*, 67(12), 2072-2078.
50. Overwien, B. (2010). On the Significance of Informal Learning" In N. Neuber (ed.), *Informal Learning in Sport: Contributions to the General Education Debate* (pp. 35-51). Wiesbaden: VS publishing house for social sciences.
51. Pfeifer, C., & Cornelissen, T. (2010). The Impact of Participation in Sports on Educational Attainment - New Evidence from Germany. *Economics of Education Review*, 29(1): 94-103.
52. Potuto, R., & O'Hanlon, J. (2006). National Study of Student Athletes Regarding their Experiences as College Students. *College Student Journal*, 41(4), 947-966.
53. Reinders, H. (2016). From education to optimization moratorium. *Discourse on Childhood and Adolescence Research*, 11(2), 147-160.
54. Rindermann, H., & Oubaid, V. (1999). Freshman selection-suggestions for a reliable process. *Research and Teaching*, 41(11), 589-592.
55. Ruffing, S. (2016). University learning and academic success: an analysis of predictors of successful learning and studying. Dissertation, Saarland University.
56. Sagirli, G. (2015). The introduction of the new control model in the German higher education system. Explanatory approaches for the change in management and administration of universities. Dissertation, University of Cologne.
57. Schneider, S., & Diehl, K. (2014). More than side effects: A theoretical model of the physical, psychological and social effects of sport. *Sports Orthopedics - Sports Traumatology*, 30(1), 64-70.
58. Schueler, S., Hildebrand, C., Barthel, J., & Woll, A. (2015). Comparison of the effects of a brief exercise intervention at the workplace (BKaA) at the University of Konstanz and the Karlsruhe Institute of Technology. In A. Goering & D. Moellenbeck (eds.), *Exercise-oriented health promotion at universities* (pp. 235-255). Goettingen: Goettingen University Press.
59. Schultes, K., & Schroeder, S. (2013). Academic success - dimensions and determining factors. In: M. Buelow-Schramm (ed.), *What can successful learning mean under Bologna conditions?* (pp. 87-118). Bielefeld: W. Bertelsmann Verlag.
60. Stebler, P. (2000). Academic success and student satisfaction at the Faculty of Economics and Social Sciences at the University of Freiburg i. Ue. Empirical bases for the decision of higher education economic questions. Dissertation, Freiburg i. Ue.
61. Stock, C. (2017). How important is health for the academic success of students? *Prevention and Health Promotion*, 12(4), 230-233.
62. Sudeck, G., & Pfeifer, K. (2016). Physical activity-related health competence as an integrative objective in exercise therapy and health sports - Conception and validation of a short questionnaire. *Sports Science*, 46, 74-87. doi 10.1007/s12662-016-0405-4.
63. Teichler, U. (2016). Bologna - a normal step in academic reform or an unexpected system change? In: A. Speer & A. Berger (eds.), *Science with a Future. The old Cologne University in the context of European University history* (pp. 397-429). Cologne: Boehlau.
64. Tinto, V. (1993). *Leaving College. Rethinking the Causes and Cures of Student Attrition*. Chicago: University of Chicago Press.
65. Van Buer, J. (2011). On the focus of empirical university research on early withdrawal from studies - why we look at failure in this way. In O. Zlatkin-Troitschanskaia (ed.), *Stations Empirical Educational Research* (pp. 463-475). Wiesbaden: VS publishing house for social sciences.
66. Walk, L. (2011). Movement shapes the brain: insights from brain research relevant to learning. *The Journal of Adult Education*, 1, 27-29.
67. Whitehead, M. (2001). The concept of physical literacy. *European Journal of Physical Education*, 6(2), 127-138.
68. Wolter, A. (2015). University research. In: H. Reinders, H. Ditton, C. Graesel & B. Gniewosz (eds.), *Empirical Educational Research. Structures and Methods* (pp. 149-164). Wiesbaden: Springer VS.

**Primary Paper Section: A**

**Secondary Paper Section: AK, AM**