

# Influence and Integration of Sports Apps on Sports Behavior of College Students

Han Wang<sup>1,\*</sup>

<sup>1</sup>Graduate School, University of Baguio, Baguio, Philippines

\*Corresponding author: 632664623@qq.com

**Abstract:** Regular physical activity is essential for college students, yet maintaining consistent participation remains challenging. Sports apps offer a promising solution, but evidence on their effectiveness among Chinese students is scant. This study examined the influence of sports apps on the sports behavior of college students in Huainan City. A mixed-method design was adopted, combining a quantitative survey questionnaire administered to 180 students from six colleges and qualitative semi-structured interviews with 12 purposively selected students. The findings demonstrated that sports apps were “very influential” on students’ sports performance and attitudes, enabling them to improve their athletic prowess and cultivate a more positive attitude toward physical activity. They were rated “influential” on sports motivation and sports values, suggesting that although apps help in these areas, their functionality and design still need to be improved. Qualitative results supplemented these insights by identifying key app features supporting exercise continuity, user-perceived challenges, and targeted improvement suggestions. These insights provide a basis for APP-integrated teaching approaches.

**Keywords:** Sports App, Sports Behavior, Sports Exercise, Application Research

## 1. Introduction

### 1.1. Background of the Study

APP is an application on smartphones<sup>[1]</sup>. Sports APP is an intelligent product of the diversified development of the sports industry, and is a new mode of sports applied in the field of sports using Internet technology<sup>[2]</sup>. Sports APP provides a detailed introduction to the sports activity program, distinguishing it from the knowledge in books and the multiple limitations of traditional sports knowledge. This shared guidance can be based on different groups of people with different sports interests and hobbies, which can both record the user’s specific data for each workout (calories consumed, duration of exercise, range of motion, sports programs, etc.). It can also provide relevant exercise guidance based on the user's exercise habits, and cultivate the user's sports awareness and behavior through punching cards or sharing other users' exercise feelings and sports dynamics<sup>[3]</sup>. Through a scientific approach, it guides many users to develop a healthy lifestyle.

The research on sports APP abroad is earlier and more comprehensive than that in China, where Apple and other companies have promoted diverse applications across fields, including sports, to enhance participation through gamification and social interaction. Yuedongquan, Gudong, and Keep are the top sports apps in China. Previous studies research demonstrates their influence on college students’ exercise habits. College students being more receptive to sports programs with video guidance and simple exercise movements during physical exercise<sup>[4]</sup>, while other researcher proposed using fun guidance in sports apps, such as social platform rankings, healthy action challenges set up in sports apps, and adventurous sports project push stimuli<sup>[5]</sup>, to attract different individuals to engage in sports exercise behavior.

In addition, a statistical survey of fitness apps on the market, investigated the students who use these apps, analyzed the characteristics of students' use of apps through the status quo survey, interviewed the students, understood the students' functional preferences of apps through conversation, and understood the purpose of students' use of apps<sup>[6]</sup>. Sports apps can promote the monitoring of students' physical exercise and urge them to be active<sup>[7]</sup>. Sports behavior of Uyghur college students and investigated the students' sports behavior in multiple dimensions of mental and physical activities<sup>[8]</sup>. Together, these studies support that sport apps highlight their potential role in fostering healthier lifestyles.

## 1.2. Theoretical Framework

This study involved the Self-Determination Theory (SDT)<sup>[9]</sup> to assess the impact of sports apps on the physical education behaviors of college students in Huainan City. Self-determination theory emphasizes an individual's motivation and intrinsic needs behind their behavior. It proposes three basic psychological needs, namely autonomy, competence, and relatedness. Through the sports apps, college students may fulfill these needs by choosing appropriate exercise programs (autonomy), perceiving improvement in their athletic ability (competence), and creating an exercise community through social features (relatedness). Both intrinsic motivation, enjoyment and accomplishment, and extrinsic motivation, rewards and challenges, are relevant, making SDT an appropriate framework for this study.

Social Cognitive Theory<sup>[10]</sup> holds that behaviors are learned through observation, imitation, and reinforcement. In the case of sports apps, college students would probably observe their peer's workout experiences (observational learning), imitate the demonstrated techniques and schedules of workouts, and be motivated by achievement badges or ranking. Watching others succeed may also enhance the students' confidence in their ability to engage in the activities and, thus further encourage participation for how sports apps influence the internal motivation of college students, Social cognitive Theory does provide insight into how such sports apps also influence the externally reinforced behaviors of college students.

The study follows the Input-Process-Output model. Sports apps served as the input; mixed-methods research (survey questionnaire and interviews) as the process; in terms of output, the study provides insights on sports apps' influence, features and integration recommendations (Figure. 1).

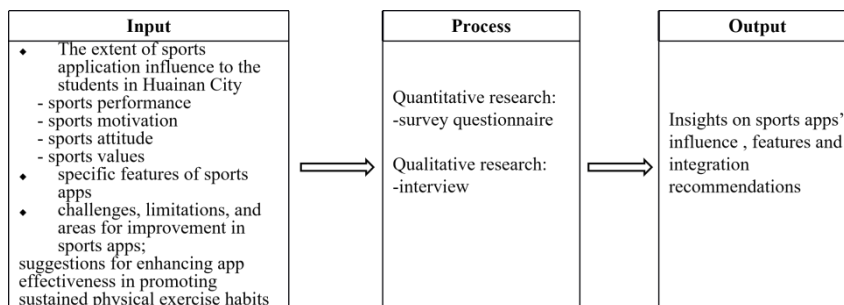


Figure 1: Schematic Illustration of the Study

Under the background of "Healthy China" 2030 Program Outline and the era of national fitness, college students, as a group with strong action and high ideological awareness, should be positively guided to enhance the enthusiasm of college students for sports. This study investigates on the students of colleges in Huainan City. Specifically, state of the problem is as follows:

- (1) What extent this sports apps influence the students in Huainan City in terms of:
  - a) sports performance;
  - b) sports motivation;
  - c) sports attitude;
  - d) sports values
- (2) What specific features of sports apps do college students perceive as positively impacting their workout continuity and physical activity levels?
- (3) What perceived challenges, limitations, and areas for improvement in sports apps are reported by college students, and suggestions for enhancing app effectiveness in promoting sustained physical exercise habits?

## 2. Methodology

### 2.1. Research Design

This study adopted a mixed method specifically explanatory research design that utilizes both quantitative and qualitative data analysis. Quantitative research can provide statistical data and trend

analysis, while qualitative research can provide a deeper understanding of participants' perspectives and experiences. By combining the two, researcher can obtain more three-dimensional research results.

## 2.2. Population and Locale of the Study

The population of the study included 180 students from six colleges in Huainan City, Central Southern Anhui Province, China. Respondents for the survey questionnaire were chosen randomly to enhance the representativeness of the sample. Twelve students for the interviews were purposively selected.

The inclusion criteria for this study were students officially enrolled in the academic year 2023-2024 (first-year university students) at colleges in Huainan for at least one year. Students included were those who could understand and answer survey questionnaires in Mandarin and had experience in college physical education classes. The exclusion criteria were students who dropped out formally or informally during the study period.

## 2.3. Measures and Procedure

The researcher referred to a large number of literature and relevant questionnaires on sports apps and college students' sports behavior, and modified the design of the "Questionnaire on the Influence of Sports APP on College Students' Sports Behavior"<sup>[11]</sup>. The survey questionnaire assessed how the sports apps affect the physical activity of college students in Huainan City in terms of their sports performance, sports motivation, sports attitudes, and sports values. Respondents were rated using a four-point Likert scale: (4) very influential; (3) influential; (2) slightly influential; and (1) not influential at all. The researcher coordinated with the colleges to select suitable participants based on the inclusion criteria. The questionnaires were distributed to students, and responses were collected within the academic year 2023-2024.

For qualitative research, semi-structured interviews were conducted to explore in-depth insights aligned with the study's objectives. The interview guide questions aimed to elicit detailed feedback on app features supporting workout continuity, perceived challenges, and improvement suggestions. Each interview was audio-recorded with participants' consent, and transcribed verbatim for thematic analysis.

## 2.4. Data Analysis

The data collected from quantitative surveys and qualitative interviews was analyzed using complementary techniques to address the study's research questions comprehensively.

The data collected was processed using statistical and analytical techniques. Weighted Means were computed to answer statement of the problem regarding the extent to which sport apps influence the students in Huainan City. The researcher used the mean and variance from the Likert scale for analysis (Table 1), which helped in understanding the central trends and variability of the data. The average represented the overall attitude or perception of respondents towards the identified influence of sports apps. Variance measured the degree of data dispersion, indicating whether responses were closely clustered or widely spread.

For qualitative interview data, thematic analysis was conducted to identify key patterns aligned with the study's objectives. Interview transcripts were coded inductively, focusing on recurring themes. Key quotes from participants were extracted to illustrate core themes, providing contextual depth and supporting the quantitative findings with real-world insights.

*Table 1: The Extent of Influence Sports Apps on Sports Performance, Sports Motivation, Sports Attitudes, and Sports Values*

Relative Value	Statistical Limits	Description	Interpretation
4	3.26 - 4.00	Very influential	Sports apps have been very helpful and influential in the physical activity of college students in Huainan City in terms of their sports behavior.
3	2.51 - 3.25	Influential	Sports apps have helped and influenced students' sports behaviors in the physical exercise of college students in Huainan City, but further improvement is needed.
2	1.76 - 2.50	Slightly influential	Sports apps have helped and influenced students' sports behavior to a very limited extent in the physical exercise of college students in Huainan City.
1	1.00 - 1.75	No influential at all	Sports apps have absolutely no help and influence on students' sports behavior in the physical exercise of college students in Huainan City.

## 2.5. Ethical Consideration

Participation of educators and students was voluntary, and they had the right to withdraw at any time without negative consequences. Participants were informed about the nature of the research, their rights, and the potential risks and benefits, and provided informed consent before joining the study. Privacy and confidentiality were strictly protected. Personal information was not disclosed, and anonymity or pseudonymity was employed to safeguard data security. The study complied with national and institutional ethical standards, and the research plan was submitted for ethical review prior to data collection.

## 3. Result and Discussion

Below are quantitative findings on sports apps' influence across four core dimensions, complemented by qualitative interview insights. These results illustrate how apps shape students' sports behavior, with detailed quantitative analysis followed by exploration of key app features, challenges, and suggestions.

### 3.1. Extent of Sports Apps Influence on the Students

#### 3.1.1. Along Sports Performance

Table 2 shows that sport apps were considered very influential in improving students' sports performance, with mean of 3.561, 3.706, and 3.306. Students agreed that apps boost athleticism, encourage intentional physical activity, and support goal setting, with an overall mean of 3.524 indicating strong agreement on their positive influence.

Table 2: The Extent of Influence Sports Apps on Sports Performance

Indicators	Average Mean	Standard Deviation	Description
a. The sports App has been a boost to my athleticism.	3.561	0.590	Very influential
b. Using a sports app has helped me to be more intentional about my physical activity.	3.706	0.481	Very influential
c. Sports apps have played a positive role in setting and reaching my goals in sports.	3.306	0.741	Very influential
Mean	3.524	0.604	Very influential

At the same time, it could be seen some variation in standard deviations reflected differences in user experiences. This suggests that sports apps significantly improve students' physical performance, existing design may not fully meet the needs of all students and still require further optimization and improvement.

The findings confirm the research of the improvements in exercise frequency, ability, and fitness through sports apps<sup>[12]</sup>. Sports apps help users improve their overall athletic ability by developing training plans and providing scientific training guidance. Utilize data analysis to understand users' athletic performance and progress, in order to optimize training plans and improve athletic performance. Therefore, it can be concluded that sports apps effectively improve users' exercise performance through these features. This is mainly related to self-determination theory, as it emphasizes how personalized exercise plans can meet individual autonomy needs, enhance intrinsic motivation, and thus improve athletic performance and attitude.

#### 3.1.2. Along Sports Motivation

According to table 3, the average value of indicator a is 2.911, the average value of indicator b is 2.683, and the average value of indicator c is 2.700, which means that student participants believe that using sports apps has helped them actively exercise and increased their motivation to participate in sports. The response suggest agreement to the identified influence of sports apps. However, further improvement is needed, such as providing personalized exercise advice and plans based on users' exercise history, interests, and physical condition.

Table 3: The Extent of Influence Sports Apps on Sports Motivation

Indicators	Average Mean	Standard Deviation	Description
a. I feel more motivated to participate in physical activity after using the Sports App.	2.911	0.874	Influential
b. With sports apps, it's easier for me to create and stick to my exercise program.	2.683	0.924	Influential
c. Health data tracking in sports apps has positively impacted my motivation to exercise.	2.700	0.909	Influential
Mean	2.765	0.902	Influential

This indicates that although sports apps have played a partial role in improving exercise motivation, there is still room for improvement. Features such as personalized training plans, check-in mechanism, and daily reminders can enhance motivation by setting clear goals, providing a sense of achievement, and helping users maintain exercise habits in busy schedules. The findings of this study confirm with the research that participants who used sports apps reported significant increases in exercise motivation, frequency, and participation<sup>[13]</sup>. Sports apps enable users to share results and compare with others, creating a sense of competition and enthusiasm.

### 3.1.3. Along Sports Attitude

Table 4 reports the average value of indicator a is 3.650, the average value of indicator b is 3.483, and the average value of indicator c is 3.594, which means that almost all student participants believe that exercise apps have a significant Influence on users' positive attitudes. The response suggests strong agreement on the identified influence of sports apps. At the same time, the standard deviations (0.523, 0.621, and 0.586) show that participants' opinions were relatively consistent overall, through some differences existed depending on the function.

Table 4: The Extent of Influence Sports Apps on Sports Attitude

Indicators	Average Mean	Standard Deviation	Description
a. The use of the Sports App has given me a positive attitude towards physical activity.	3.650	0.523	Very influential
b. Social interaction features in sports apps make me more likely to play sports with others.	3.483	0.621	Very influential
c. With the guidance of the sports app, I'm more willing to try challenging sports goals.	3.594	0.586	Very influential
Mean	3.576	0.577	Very influential

This reveals that sports apps could have designed fun challenge activities and phased rewards to motivate users to constantly challenge themselves and enhance their self-efficacy. Continuing to develop and optimize the functions of sports apps would more effectively enhance students' attitudes towards exercise, making them more active and engaged in the path of healthy living.

The findings of this study confirm<sup>[11]</sup>, which showed significant positive changes in exercise attitudes among participants using exercise apps, especially in terms of willingness to participate and self-efficacy. This emphasizes the influence of personalized exercise plans and feedback mechanisms on sports performance and attitudes. Personalized training plans provide clear goals and targeted training, while data feedback enhances enthusiasm and interest. This is mainly related to self-determination theory, as it emphasizes how personalized exercise plans can meet individual autonomy needs, enhance intrinsic motivation, and thus improve athletic performance and attitudes.

### 3.1.4. Along Sports Values

The average value of indicator a presented in table 5 is 3.083, the average value of question b is 3.011, and the average value of indicator c is 3.067, indicating that most student participants believe that sports apps have helped and influenced users' sports values to some extent. They pay more attention to physical exercise and personal health, as well as the importance of physical exercise for personal development. At the same time, the standard deviations (0.890, 0.986, and 0.906) reflected significant individual differences in the impact of sports applications on users' sport values.

Table 5: The Extent of Influence Sports Apps on Sports Values

Indicators	Average Mean	Standard Deviation	Description
a. The use of the Sports App has deepened my understanding of the importance of physical activity.	3.083	0.890	Influential
b. Through the Sports App, I have become more aware of the health benefits of exercise.	3.011	0.986	Influential
c. Exercise goal setting in the Sports App has made me more aware of the importance of physical activity for personal development.	3.167	0.906	Influential
Mean	3.087	0.782	Influential

This implicates that importance should be attached to the promotion of physical exercise, and strengthening the functionality and content design of sports apps can better guide the development of users' exercise habits and values, enhance their understanding of sports values, and stimulate their pursuit of a healthy lifestyle. The findings of this study are consistent with the research which showed that participants who used sports apps significantly improved their sports values scores<sup>[14]</sup>, demonstrating more positive sports values. This emphasizes the importance of sports apps for sports values, as they enable students evaluate their own performance, promote self-management, and develop good self-evaluation habits.

Table 6 is based on students' responses on the extent to which sports apps influence sports performance, sports motivation, sports attitude, sports value. Overall, the results (3.237) indicate that sports apps are influential in shaping college students' physical exercise behavior in Huainan City, but optimization of design and functionality is necessary to strengthen their impact on motivation and values.

Table 6: Table for the Four Dimensions

Dimension	Mean	Verbal Description
1. Sports performance	3.524	Very influential
2. Sports motivation	2.765	Influential
3. Sports attitude	3.576	Very influential
4. Sports values	3.087	Influential
Overall Mean	3.237	Influential

### 3.2. Sports App Features Enhancing Workout Continuity and Physical Activity

Regarding sports app features that boost workout continuity and physical activity, students highlighted two key dimensions aligned with the interview questions. For exercise programs and instructions, a student (S6) noted, "It helped me improve my athletic performance and learned how to conduct comprehensive physical training," while S10 added, "Using sports apps to record and analyze my exercise data can help me develop long-term sports training plans and enhance my athletic performance," showing that structured guidance and data-driven planning effectively support skill improvement. For progress tracking and continuity, S7 emphasized, "The personalized and diversified training plan has given me clear goals every day, and I have gained a great sense of achievement, which has made me more motivated to exercise," and S9 mentioned, "The daily reminder function of the sports app helps me squeeze out time for cycling in my busy studies." These responses implicate that college students can prioritize using sports apps with comprehensive training programs and user-friendly progress tracking functions, such as goal customization and daily reminders, to better maintain exercise continuity and improve physical activity levels.

These findings align with the research which highlight the role of personalized guidance and social features in sustaining exercise behavior<sup>[15]</sup>, and resonate with Social Cognitive Theory, emphasizing observational learning, imitation, and self-efficacy as mechanisms through which apps influence students' sports engagement.

### 3.3. Challenges & Limitations, Areas for Improvement & Suggestions for Enhancing Effectiveness

In terms of perceived challenges and limitations, students identified practical issues that hinder app usage. A student S4 stated, "The app's data synchronization is unstable sometimes—my workout records

on the phone don't always update to the tablet," and S8 noted, "Some advanced exercise programs require paid membership, and the free content is too basic for intermediate users like me." For areas for improvement and suggestions to enhance effectiveness, S2 suggested, "I hope the app can customize programs more precisely based on real-time physical status, like adjusting intensity when my heart rate is too high," and S5 proposed, "It would be better to add trend charts for muscle gain or endurance improvement, so I can see tangible changes more clearly." These responses reveal that students prioritize apps with stable data synchronization and rich free advanced content, and choose those that offer real-time program adjustment and detailed data visualization to better address their exercise needs.

The findings are aligned with SDT, which emphasizes the fulfillment of basic psychological needs as foundational to sustained behavior. Sports apps' personalized training programs and flexible exercise options allow students to choose activities aligned with their preferences, satisfying the need for autonomy<sup>[13]</sup>.

Combining quantitative and qualitative findings, sports apps exert an overall positive influence on Huainan college students' sports behavior—"very influential" on sports performance (Mean=3.524) and attitude (Mean=3.576), and "influential" on motivation (Mean=2.765) and values (Mean=3.087). Qualitative interviews supplemented these statistics by identifying supportive app features, practical challenges, and targeted improvement suggestions. Together, these findings underscore sports apps' value in shaping students' exercise behavior and point to clear functional optimization directions to strengthen impacts on motivation and values.

## **4. Conclusions and Recommendations**

### **4.1. Conclusions**

This study focused on the influence of sports app on the sports behavior of college students in Huainan City from four dimensions: sport performance, sports motivation, sports attitude, and sport values.

Sports apps are very influential in enhancing students' sports performance and attitudes, helping them improve athletic ability and develop more positive view toward physical activity. The influence on sports motivation and sports values are moderate, further improvement in design and functionality is needed.

Qualitatively, key supportive app features included structured training, progress tracking, and daily reminders; main challenges were unstable data synchronization and limited free advanced content, with suggestions focusing on real-time program customization and detailed data visualization. Taken together, these findings provide a basis for developing an APP-integrated teaching framework in college physical education.

### **4.2. Recommendations**

Based on the above research findings, the following recommendations are made.

Colleges are encouraged to promote the integration of sports apps into teaching with three core modules: integrate the app's structured training programs and real-time feedback into in-class physical education to meet students' demand for scientific exercise guidance; leverage the app's progress tracking and daily reminder functions for after-class exercise supervision, addressing challenges in maintaining workout continuity; and incorporate app-generated exercise data, such as goal completion rate, into physical education assessment to enrich evaluation dimensions. Sports app developers should optimize design and functionality, addressing issues like unstable data synchronization and limited free content, and integrating real-time program customization and detailed data visualization, to better improve students' motivation and values, promoting active engagement and healthier lifestyles.

Future studies are needed to deepen understanding and address remaining gaps. Future research should investigate why the effects of sports apps on motivation and values are only moderate and look into ways to improve these areas. New insights to improve engagement and exercise behavior may also be obtained through comparative research across student groups and the incorporation of cutting-edge technologies like AI or VR.

## **Acknowledgements**

The author would like to thank the anonymous reviewers and editor. Special thanks are also due to

the advisor for valuable support.

## Declarations

The author declares that there are no competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## References

- [1] Wei H, Song Y, Chen J. *Research on running APP[J]. Sports Culture Guide, 2017: 190-195.*
- [2] Zhou S. *Research on the impact of sports APP on college students' sports socialization[D]. Guangzhou: South China University of Technology, 2018.*
- [3] Song Q. *Research on the influence of sports APP on college students' adherence to physical exercise[D]. Wuhan: Central China Normal University, 2016.*
- [4] Wu X, Li R. *Exploring the promotion of high-quality development of national physical health through sports apps under the background of national fitness[C]//Proceedings of the 5th National Fitness Science Conference - Wall Poster Exchange (II). 2024: 64-65.*
- [5] Elizabeth A, Johnson B, Smith C, Williams D. *The impact of fitness apps on physical activity behavior: A mixed-methods study[J]. Journal of Health Psychology and Technology, 2017, 12(4): 345-360.*
- [6] Wang Z. *Research on the dissemination effect of sports and fitness apps[D]. Beijing: North China University, 2020.*
- [7] Liu F. *Exploring the Application of Sports and Fitness Apps in College Physical Education Teaching[J]. Contemporary Sports Technology, 2021, 11(27): 1-3.*
- [8] Gao Z. *Research on the influence of using fitness APP on the after-school physical exercise behavior of ordinary college students in Shanghai[D]. Shanghai: Shanghai Physical Education College, 2020.*
- [9] Deci E L, Ryan R M. *Intrinsic motivation and self-determination in human behavior[M]. New York: Plenum, 1985.*
- [10] Bandura A. *Social foundations of thought and action: A social cognitive theory[M]. Englewood Cliffs, NJ: Prentice-Hall, 1986.*
- [11] Zhang Q. *Diversified application of college sports information platform in the context of "Internet plus"[J]. Stationery and Technology, 2023(13): 171-173.*
- [12] Zhang Z. *Research on the influencing factors of users' willingness to continue using mobile fitness apps[D]. Beijing: Beijing Sport University, 2022.*
- [13] Li Y, Zhang X, Fu R. *Can the sports apps using play an intervening role in the process of college students' exercise motivation affecting mental health by exercise adherence[J]. Health Psychology Research, 2024, 12(3): 17479.*
- [14] Chen Y. *The current usage status of fitness apps among college students: taking the School of Sports and Health Sciences at Guangxi University for Nationalities as an example[J]. New Sports, 2023(12): 5-8.*
- [15] Li Y. *The impact of sports apps on physical exercise for college students: Taking Zhejiang Normal University as an example[J]. Journal of Advances in Sports and Physical Education, 2023, 6(11): 45-53.*