



CampusPlay: Leveraging Community-Based Digital Innovation to Boost University Students' Sports Engagement

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ABSTRACT

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This study aims to develop a community-based digital innovation to enhance university students' participation in sports activities. Despite the widespread use of digital technology, students often struggle with limited information, coordination issues, and a lack of collaborative platforms. Using the design thinking approach, the research focuses on the development of the "CampusPlay" application. The study follows the four stages of design thinking: empathize, define, ideate, and prototype, excluding the testing phase. The findings suggest that students require a digital platform to help find sports partners, manage schedules, and implement a deposit-based payment system to improve commitment. The CampusPlay wireframe incorporates key features, such as "Find Partner" and "Create Match," promoting social collaboration and efficient management of campus sports activities. The design thinking methodology proves effective in creating user-centered, community-driven digital solutions that foster social sustainability within the university context.

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INTRODUCTION

The rapid evolution of digital technology has reshaped the way people live and interact, making it a vital force in contemporary society (Hanandini, 2024; Ruzimatjon, 2024; Yeasmin, 2024). In particular, university students, who are considered digital natives, are heavily immersed in technology (Fatmasari et al., 2025; Fawaid et al., 2025). However, the increasing reliance on digital platforms has led to significant changes in students' physical activity levels and social engagement (Cui et al., 2024; Goodyear et al., 2023; Nan & Agarwal, 2024). According to data from the Ministry of Youth and Sports (2023), only 27% of Indonesian university students engage regularly in organized sports activities. This statistic highlights a growing disconnect between the potential for physical

engagement and the current sedentary lifestyles that have emerged due to technology. As students' reliance on digital media continues to grow, fostering an environment that promotes both physical and social activity has become an urgent concern. This issue not only affects individual well-being but also has broader social implications, as it contributes to a lack of community engagement and a decline in physical health among the younger population.

Despite the extensive availability of sports facilities in many universities, student participation in physical activities remains low. One major obstacle is the limited access to information regarding available sports programs and partners. Many students face difficulties in finding others to participate in sports with, which contributes to the lack of motivation to engage in such activities. Additionally, without an efficient digital system to help coordinate schedules, book facilities, or even share rental costs, the barriers to participation become even more pronounced. This issue is exacerbated by the lack of a platform that can facilitate social interaction and community building around sports activities. As a result, even with the physical infrastructure in place, the actual utilization of these resources remains underwhelming. The problem, therefore, lies not only in the availability of infrastructure but also in the absence of a system that connects and motivates students to engage with it.

In practice, students at Indonesian universities often struggle with the coordination of sports activities, which limits their participation and engagement. In Bogor City, for example, university students from various faculties and levels of study face challenges in finding suitable partners for sports activities, resulting in an overall lack of engagement in physical exercise. Additionally, students often encounter difficulties when trying to organize group sports activities due to conflicting schedules, lack of shared resources, or even financial constraints related to renting sports facilities. These obstacles make it increasingly difficult for students to engage in sports regularly, despite having the resources available to them. Furthermore, the absence of an integrated platform that can facilitate collaboration and communication between students has contributed to this ongoing issue. The need for a digital solution to bridge these gaps is evident, as it would not only improve students' participation in sports but also enhance their social interactions within the university environment.

Previous studies on digital solutions in the context of university students' sports participation have explored various approaches to overcoming the challenges of coordination and engagement (Gholami & Chime, 2024; Ye & Liu, 2025). Many studies have highlighted the importance of digital platforms for promoting physical activity, emphasizing the role of social networks and mobile applications in fostering participation. For instance, research by Adriani &

Irwandy (2024) identified that digital tools could facilitate the process of finding sports partners and organizing events, enhancing social interaction and motivating students to participate. Similarly, other studies have pointed to the potential of gamification and reward systems in motivating students to engage in regular physical activities (Arufe-Giráldez et al., 2022; Soriano-Pascual et al., 2022). However, these studies often fail to consider the specific needs of students in the context of university environments, particularly in relation to scheduling and facility management. While digital platforms have been used to promote physical activity, most existing applications do not address the nuanced challenges faced by university students, such as financial constraints or the lack of a community-driven approach.

Despite the advancements in digital solutions, gaps remain in addressing the full range of barriers to sports participation among university students. Many existing platforms are too generalized, often neglecting the need for community-based solutions that foster deeper connections and more meaningful social engagement. Research has shown that students are more likely to engage in physical activities if they feel part of a community (Van der Vliet, 2019). However, most digital innovations still focus on isolated features, such as event scheduling or partner matching, without considering the broader social context and the potential for shared experiences. This research aims to fill this gap by developing a comprehensive platform—CampusPlay—that combines social interaction, scheduling, and financial collaboration in a way that aligns with the specific needs of university students. By doing so, it seeks to enhance the overall sports engagement and social sustainability on campuses.

The novelty of this research lies in its approach to combining community-driven design with the practical challenges faced by university students in their pursuit of sports engagement. The CampusPlay application is not just a platform for finding sports partners or booking facilities but also integrates features that encourage collaborative scheduling and shared financial responsibility, enhancing the sense of community among students. This holistic approach is particularly important as it addresses the interrelated barriers of coordination, motivation, and social engagement that are not sufficiently addressed in previous studies. The platform's potential to foster social sustainability by encouraging collaboration and shared participation represents a significant step forward in digital innovations aimed at enhancing physical activity among university students. Its development is timely, as it responds to the urgent need for solutions that bridge the gap between the availability of sports infrastructure and its actual utilization.

The central research problem addressed by this study is the low level of student participation in sports activities, despite the availability of resources.

This study argues that the key to improving participation lies in the development of a community-based digital platform that facilitates the coordination of sports activities, fosters social connections, and addresses financial barriers. The research aims to create a platform—CampusPlay—that combines the benefits of digital technology with the social needs of students. Through this solution, the study contributes to the growing field of digital innovation in university environments, offering a model that could be replicated in other institutions facing similar challenges. By focusing on user-centered design, the study provides insights into how digital tools can enhance both social interaction and physical activity, ultimately contributing to the overall well-being and social sustainability of the university community.

RESEARCH METHOD

This study employed a qualitative research design to gain a deeper understanding of the behaviors (Aguas, 2022; Cole, 2024), experiences, and needs of university students regarding sports participation. A qualitative approach was selected as it allows for a more comprehensive exploration of users' perspectives, particularly in understanding the challenges they face in accessing and engaging in sports activities. The research focused on gathering rich, descriptive data that would inform the design of a community-based digital platform. This approach is well-suited for studies that aim to generate creative solutions based on user-centered insights, making it an ideal fit for the design thinking methodology employed in this study.

The research was conducted in Bogor City, Indonesia, among university students from various faculties and academic levels. The location was selected because it is home to several universities with diverse student populations, providing a representative sample of students from different disciplines and backgrounds. The choice of this location also aligns with the research objective to address the challenges faced by university students in engaging with sports activities on campus. Bogor City, with its unique combination of urban and academic environments, offers an ideal context to explore the issues related to sports participation and digital innovation within a university setting.

Data were collected using an online questionnaire distributed to active university students in Bogor City. A purposive sampling technique was employed to select 40 participants who were either physically active or had prior experience with sports activities on campus. This sampling method was chosen to ensure that the respondents' experiences were relevant to the research objectives, providing valuable insights into the specific needs and challenges of students in relation to sports participation. The questionnaire was designed to capture detailed information on students' sports habits, motivations, barriers,

and preferences for a digital platform that could support their engagement with sports activities.

The data collected from the online questionnaire were analyzed using qualitative analysis methods to identify key themes and patterns related to students' sports participation. During the analysis, responses were categorized into distinct areas such as barriers to participation, motivations, and preferences for digital solutions. The research utilized the design thinking approach to guide the analysis process, with a focus on empathizing with users' experiences and defining the core problems they face. Tools such as Empathy Mapping, Customer Journey Mapping (CJM), and the Value Proposition Canvas (VPC) were employed to map out users' emotional responses, trace the barriers in their sports participation journey, and identify potential solutions. The results from these analyses informed the ideation and prototyping stages, culminating in the design of the CampusPlay application.

RESULT AND DISCUSSION

Result

The empathize stage was conducted to understand students' conditions, habits, and challenges related to sports activities on campus. This process involved distributing questionnaires and conducting brief interviews with students from various study programs at University. The objective was to gain an in-depth understanding of students' perceptions, routines, and obstacles in engaging in physical exercise.

Respondents consisted of 74% Master's (S2) students and 26% Bachelor's (S1) students. Based on gender, 66% were female and 34% male. Most respondents reported engaging in sports only 1–2 times per week, indicating a relatively low level of physical activity among students. Interview findings revealed that although students are aware of the importance of exercise for maintaining health, they still face several constraints, including limited time availability, difficulties in finding sports partners, and challenges in accessing information regarding campus sports facilities. A summary of the empathize stage is presented in the Empathy Map in Table 1, which captures students' thoughts, feelings, motivations, and pain points related to sports participation.

Table 1. Student Empathy Map

Says	Feels
"I want to exercise/play sports but I don't know who I can ask."	More often postpones exercising/playing sports because they don't know how to book a field or find playmates.
"If there was an application to find sports partners, it would be really fun."	Often searches for information in WhatsApp groups or campus Instagram, but it's not regular/consistent.

Thinks/Does	Hears/Sees
Sees other friends being more active because they have their own sports community.	Hears/Sees other friends being more active because they have their own sports community.
Sees fields often empty, but doesn't know how to book them.	Hears/Sees fields often empty, but doesn't know how to book them.

Define

The define stage aimed to analyze and synthesize the core problems faced by university students based on the insights gathered during the empathize phase. The analysis identified three critical challenges that hinder students' participation in sports activities on campus. First, students experience significant difficulty in finding sports partners who share similar interests and availability. This challenge is compounded by the lack of a centralized platform where students can easily connect with potential partners, which ultimately leads to missed opportunities for engagement in physical activities. Second, many students face limited access to updated and accurate information about the schedules and availability of campus sports facilities, which often results in confusion and frustration when trying to book spaces for their activities. Third, the absence of an accessible and efficient system for booking sports courts and managing payments further discourages participation, as students are unable to easily reserve facilities or coordinate group activities.

These findings highlight the need for a digital platform that not only connects students with compatible sports partners but also streamlines the process of accessing relevant facility information and booking sports courts. The ability to book facilities and share information about availability is particularly important, as it would eliminate many of the barriers students face when trying to organize sports activities. Furthermore, an integrated payment system would help alleviate the logistical issues that often arise when coordinating group activities, making it easier for students to manage their participation without the added burden of administrative tasks.

The problem statement emerging from this analysis emphasizes the necessity of a digital solution that addresses both social and logistical barriers to sports participation. Specifically, students need a platform that allows them to find and connect with sports partners, access updated schedules for campus facilities, and seamlessly reserve spaces for their activities. By focusing on these core user needs, the CampusPlay application is positioned to provide an integrated solution that enhances sports participation, simplifies coordination, and fosters a sense of community among students.

In conclusion, the define stage's analysis of students' challenges has been pivotal in shaping the direction of the solution. The identified issues emphasize

the importance of a digital platform that integrates social and logistical features to enhance the overall sports experience for university students. This foundational understanding of user needs has guided the subsequent stages of the design thinking process, ensuring that the final solution—CampusPlay—addresses the key pain points while providing a user-centered, comprehensive approach to increasing sports participation on campus.

Ideate

The ideate stage involved generating creative solutions based on the previously identified user needs. The ideation process focused on enabling easier access to sports-related information, facilitating student connections, and ensuring transparent participation through a deposit-based system.

Three alternative concepts were produced through brainstorming and analysis using the Value Proposition Canvas (VPC): 1) Sports Buddy App, a location-based sports partner-matching platform. 2) CampusFit Portal, an information and community portal for campus sports activities. 3) CampusPlay, an integrated platform combining sports partner search, facility booking, and a shared deposit system.

Each alternative was evaluated based on feasibility, social impact potential, and relevance to students’ needs. Results indicated that the Sports Buddy App, while simple, lacked comprehensive coordination features; the CampusFit Portal strengthened community building but was less practical for routine activities; and CampusPlay emerged as the most comprehensive solution, integrating social and logistical functionalities. Therefore, CampusPlay was selected as the primary solution to be developed. The outcome of the ideation process is summarized in the Initiative Canvas presented in Table 2.

Table 2. Initiative Canvas

Business Problem	Solution	Business Outcomes
Students find it difficult to find sports partners and access field information.	1. Feature "find playmates" to match schedules and sports branches.	1. Sports participation increases.
	2. Feature "create new schedule" to open a new sports session.	2. Campus sports communities are formed.
	3. Deposit system so that participation is more certain.	

User	User Benefit	Hypothesis
Active and passive sports students of IPB University.	1. Easily find playmates.	We are confident that if students have a structured sports social platform, they will be more active and motivated to exercise regularly.
	2. No confusion about looking for a field.	
	3. More motivated to exercise.	

This analysis highlights that students' core issues are not limited to facility availability but extend to a lack of social connectivity and coordination systems. Consequently, the proposed solution extends beyond a court reservation system to a community-driven sports platform.

The “find partner” feature enables students to locate sports companions based on shared interests and availability, while “create match” allows users to initiate new sessions open to other participants. The deposit-based participation mechanism serves as a commitment tool to reduce last-minute cancellations and encourage more organized activities. The ideation outputs serve as the foundation for the subsequent prototype development of the CampusPlay application.

Prototype

The prototype stage implemented the ideas generated in the earlier phases by designing a preliminary wireframe for the CampusPlay application. The wireframe consists of four primary pages: home, find match, book a court, and payment. The user flow begins with the creation of a new sports session, after which other students can join by submitting a deposit. The system automatically confirms the session once the required number of participants is met or sends a notification if the quota is not filled. Based on the users’ expressed needs, two main features were prioritized:

1. FindPartner

This feature enables users to find other students who share the same type of sport, schedule, and preferred location. Users can browse sports such as badminton, tennis, futsal, or yoga, and view groups seeking additional members.

2. CreateMatch

This feature allows users to create a new sports session, specify the time and location, and open slots for others to join. Court payment is conducted using an individual deposit system to ensure transparency and minimize unilateral cancellations.

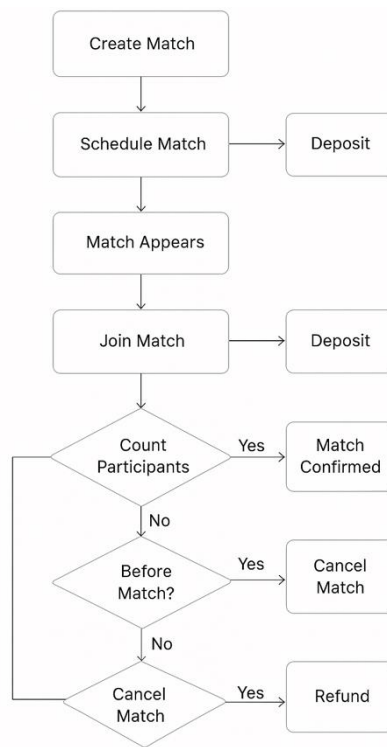


Figure 1. Illustrates the Overall Workflow of the CampusPlay System

Figure 1 shows that users start by creating a match and paying an initial deposit. The match then appears in the “find partner” section where other users may join. If the participant quota is met, the system confirms the match. If not, the system sends a notification one day before the scheduled activity, offering participants the option to increase the fee or cancel and receive a refund.

Overall, the prototype serves as a tangible representation of the design thinking process and reflects the user-centered approach adopted throughout the study. Its simple and intuitive interface, combined with social features and a transparent deposit system, positions CampusPlay as a potential solution to strengthen sports engagement and community building at campus.

Discussion

The findings of this study align with existing literature on the barriers university students face in sports participation, particularly the challenges related to finding sports partners, limited access to information about sports facilities, and the lack of an efficient booking system. As identified by previous research, digital platforms can effectively address these issues by enhancing coordination and providing greater accessibility to resources (Huda, 2024; Leong et al., 2024; Şişu et al., 2024). Our study extends these findings by not only highlighting the need for a platform to facilitate sports partner connections but also emphasizing the importance of integrating logistical features, such as court bookings and a deposit system, to reduce last-minute cancellations. This study's

results are consistent with the importance of community-driven platforms, which foster deeper engagement and social cohesion among users (Kairam et al., 2024; Valencia & Wibowo, 2025). However, unlike earlier studies, which often focused on isolated solutions, our research proposes a comprehensive platform that integrates both social and operational features, addressing multiple barriers simultaneously.

One key finding in this research is the prominence of social connectivity as a barrier to sports participation. This aligns with existing studies that stress the importance of social networks in motivating students to engage in physical activities (Hermsen et al., 2023; Wang & Li, 2025; Zainuddin et al., 2024). The “find partner” feature in the CampusPlay prototype directly addresses this need by facilitating connections between students with similar sports interests and schedules. Moreover, the “create match” feature enables students to initiate new sessions, making it easier for others to join. This feature reflects the findings of previous research, which suggested that enabling students to create their own sports sessions increases the likelihood of participation. However, our study also introduces a unique feature with the deposit-based system, which is a novel approach to ensuring commitment and reducing no-shows. This solution was not widely emphasized in prior research and represents a key theoretical contribution to the field.

From a theoretical standpoint, the research adds value to the understanding of how digital platforms can be leveraged to support both physical and social engagement within university environments. The design thinking methodology provided a structured approach to uncovering user needs and developing solutions that are deeply rooted in real user experiences. The focus on empathy, in particular, allowed the research to address students' emotional and practical concerns, which many other studies overlook. By integrating the human-centered design approach with digital technology, this study contributes to the growing body of work on digital innovations in education and health. The theoretical implications suggest that user-centered digital solutions, when designed with empathy and community in mind, can create more effective tools for encouraging participation in physical activities.

Practically, the research provides valuable insights for universities, administrators, and app developers aiming to promote student well-being through increased sports participation. The CampusPlay platform, with its user-friendly interface and integrated features, presents a practical solution to the ongoing challenges of campus sports engagement. By offering an efficient way for students to find sports partners, manage their schedules, and contribute to a shared deposit system, the platform makes it easier for students to commit to regular physical activities. This can have a profound impact on student health

and well-being, addressing concerns over sedentary lifestyles and the growing disconnect between students and physical activity. Universities can adopt this platform as a means of fostering a more active campus culture, thus contributing to the overall social sustainability of the academic community.

By comparing the results with existing literature, it becomes clear that while there is a growing recognition of the importance of digital platforms for sports engagement, most existing solutions fail to fully address the combination of social connectivity and logistical challenges. The CampusPlay application, with its integrated features and deposit system, represents a significant step forward in closing this gap. Its potential for enhancing both individual commitment to sports and social collaboration within the university setting offers practical implications for universities looking to improve student engagement and well-being. The theoretical contributions of this study also pave the way for further exploration into how community-based digital innovations can support social sustainability and physical health in academic environments.

CONCLUSION

Based on the results of this study and the application of the design thinking methodology, it can be concluded that university students require a digital platform that facilitates structured, accessible, and socially engaging sports activities. The findings from the empathize stage revealed key challenges, such as difficulties in finding sports partners, coordinating schedules, and accessing up-to-date information about campus sports facilities. These insights guided the development of the CampusPlay application, which addresses these issues by incorporating two core features: "Find Partner" and "Create Match." These features enable students to connect with suitable sports partners based on shared interests and availability, as well as initiate new sports sessions that others can join, enhancing both accessibility and social interaction.

Additionally, the implementation of an individual deposit and split-payment system was identified as an effective mechanism for increasing commitment and reducing last-minute cancellations. The wireframe design of the application demonstrates its simplicity and intuitiveness, ensuring alignment with users' needs. Overall, the study highlights the effectiveness of the design thinking approach in creating a user-centered digital solution that can foster a sustainable and active sports community within the university setting, contributing to both physical well-being and social connectivity among students.

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