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Creating an Android-based Calisthenics Application to Assist Students in Improving Their Physical Fitness

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Abstract - College students, particularly those heavily involved in coursework, frequently do not prioritize physical fitness. Regular exercise is essential for preserving physical fitness and facilitating demanding academic tasks. Although there are other fitness programs available, such as GYM, jogging, CrossFit, and Yoga, users sometimes fail to make full use of them because the content is confined to exercise videos and descriptions. This matter highlights the progress of the Android application Kali Tech, which specifically concentrates on organizing and documenting calisthenics workouts. This program employs the concept of gamification by utilizing student achievement levels to encourage students to be diligent in doing exercise. The application was developed via the Software Development Life Cycle (SDLC) Prototyping methodology in order to fulfill user requirements by incorporating features that promote regular utilization. Kali Tech underwent a one-month testing period, during which data on the responders' blood pressure was also gathered. The data analysis demonstrated that the utilization of the Kali Tech application resulted in an enhancement of the participants' physical fitness, as seen by the blood pressure graphs nearing the standard levels when using the app. The conclusion was further supported by the results of an Independent Sample T-Test analysis and the visual representations of blood pressure graphs, which demonstrated the consistent levels of respondents' blood pressure.

Keywords—Physical Fitness, Android, Fitness-supporting Applications, Calisthenics, Software Development Life Cycle, *Sport Health.*

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1. INTRODUCTION

The word "Sports Health" is synonymous with "Sports Medicine", which refers to the medical field that specializes in treating sports-related injuries and promoting overall physical well-being in athletes. Sports Health comprises a diverse array of fields that address various health concerns associated with sports. While the primary objective of sports is typically to attain the highest levels of accomplishment, it also fundamentally seeks to enhance health and the caliber of human capital [1]. Sports Health refers to the utilization of physical activity and exercise as a means to enhance one's overall health and well-being [2].

Physical fitness is a significant barrier for students, particularly due to the high cost and time constraints associated with engaging in fitness sports, which are of interest to many but hard to accommodate alongside demanding academic schedules [3],[4]. Calisthenics, a form of exercise that relies solely on body weight and does not involve

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the use of machines, can serve as a viable option for students to sustain their fitness levels. Yet, another obstacle emerges in the shape of adequate technical comprehension to ensure that movements are executed accurately and securely [5]. Calisthenic exercises involve various basic movements that use body weight without requiring additional equipment, such as push-ups, pull-ups, squats, and dips [6]. The primary objective of calisthenics is to enhance physical fitness by incorporating diverse levels of intensity and technique, resulting in robust musculature, heightened stamina, and improved balance and body coordination. Studies indicate that calisthenic training is a viable option for enhancing both metabolic rate and muscular mass [5].

This study employs the Android architecture framework to develop fitness applications for students. The key components utilized include Activity, Fragment, ViewModel, Use Case, and Repository. The user interface (UI) is structured using Activities and Fragments, whereas the ViewModel is responsible for organizing data. Use Cases are responsible for managing application logic and interacting with the Repository. The Repository utilizes Room for handling local data and Retrofit for handling distant data. Interdependence The utilization of Dagger or Hilt for dependency injection, along with LiveData for reactive UI updates, guarantees a well-organized, easily maintainable, and dependable application. These factors are crucial for ensuring the validity of the research [7]. .

2. LITERATURE REVIEW

The use of application can motivate user to live a healthy life [8][9]. Previous study show that the use of controlling calories application can help user to achieve ideal body weight. This application can help users know the number of calories needed by the body [10]. Such application can also developed to help monitor the number of calories as an effort to prevent diabetes mellitus [11], this application can help user to calculate the number of calories intakes easily. Healthy living is not only determined by a proper diet, but also needs to be supported by sufficient exercise. Mobile applications designed to promote physical activity can assist college students, who are regular users of smartphones, in enhancing their physical and emotional well-being [12]. In order to enhance user motivation in physical activity, the developed application can effectively incorporate a reward and gamification mechanism [13].

This study utilized multiple findings from prior research as the basis for examination and analysis. The results and discoveries of earlier study are vital for the research topic, which is the Development of Assistant Calisthenics Applications.

Based on the research on Development of Smartphone-Based Athlete Physical Fitness Applications During Work From Home [14], it was found that the use of demonstration videos and practice schedules can help users. The employed approach is Research and Development (R&D). Utilizing a mobile platform. The approach can be used in this study. However, this method aims to test validity and effectiveness, while this study aims to create applications according to needs. Another research on The Development of Physical Fitness Application Based On Information And Communication Technology For Higher Student [15] has features in the form of Body Composition information, video demonstrations, pacer tests and history. The application was developed using Design Based Research using mobile base. The incorporation of historical data in this article can be utilized in this research to assess the outcomes or quantify the muscles that have undergone training.

An application contains an animated muscle framework was applied on Design and Construction of Physical Training Application for Basketball Players [16]. This study employs Android Studio and the Java programming language to construct the applications. Therefore muscle animation framework can be utilized to provide users with information regarding the specific muscles that are being targeted during training. Fitness data recording was also utilized and displayed in graphical form in a Web-Based Application to Support Physical Fitness Information of Elderly People [17]. The employed technique to develop this application is prototyping. Hence, Fitness recording can be a reference in the features that will be created. The prototype method is preferable to adopt in comparison to research and development (R&D). In this approach, the user actively contributes to the development of the program by supplying the necessary needs.

During the research, multiple approaches and concepts were examined, and their relevance to the research aims varied. While certain aspects, such as video demonstrations, muscle animation frameworks, training regimens, and history, may appear feasible to implement, it is important to bear in mind that this research serves distinct aims. This research primarily emphasizes the development of apps that are tailored to meet your specific requirements. However, the SDLC (Software Development Lifecycle) waterfall and R&D approaches are not as appropriate, and the Java programming language may not align with the requirements of research. The researcher employed a study methodology that engaged users in the process of creating the application, specifically utilizing the SDLC prototyping for a more suitable approach. When selecting a programming language, Kotlin is often favored because of its readability and concise syntax. Therefore, the selection of methodologies and concepts for

decision making should be in accordance with research objectives that prioritize the development of mobile applications that cater to user requirements.

3. RESEARCH METHODOLOGY

The SDLC prototyping process is employed to design callisthenic application interfaces, enhancing responsiveness to user requirements and improving the likelihood of success [18]. SDLC is a systematic method utilized in software development to ensure timely and cost-effective completion of work [19]. The initial phase consisted of conducting interviews with students who were actively participating in sports. During these interviews, various difficulties were identified, including a lack of fundamental technical knowledge (10 out of 15 participants), challenges in selecting a suitable sport (11 individuals), as well as time and motivation limits (8 and 5 individuals, respectively). While a significant number of individuals have access to workout facilities, the majority lack essential equipment such as dumbbells or barbells (11 individuals). The primary obstacle is a deficiency in both knowledge and motivation, which impedes the ability to maintain a consistent workout routine.

The primary objective of the Kali Tech app is to arrange callisthenic workouts in order to enhance users' physical fitness, without the need for complex equipment or spacious areas. This app is compatible with Android smartphones, enabling users to train at any location and at any time. The inclusion of an achievements feature, coupled with gamification and activity report tracking, serves to enhance user incentive and effectively monitor their progress. The Use Case Diagram in Figure 1 provides a comprehensive explanation of all these aspects.

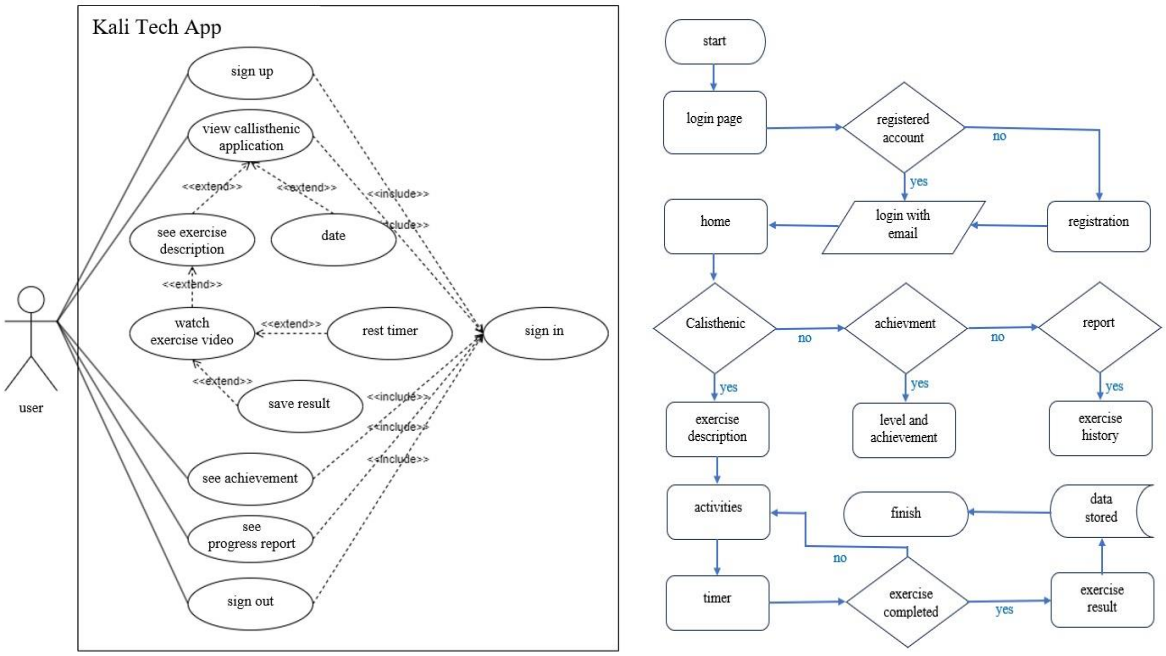

Figure 1. Kali Tech App Use Case Diagram and Flowchart

The development of student fitness applications was conducted through the use of Figma, utilising interview data as a basis. The initial design incorporates essential elements to facilitate student sports activities. Figure 2 and Figure 3 shows the interface design of the Kali Tech Application Prototyping.

The primary purpose of the Kali Tech app is to enhance student physical fitness and streamline the performance of calisthenics exercises. The three primary menus consist of Calisthenics, which includes a schedule, description, and training videos; Achievements, which contains records of accomplishments; and Reports, which focusses on sporting activities. An interface evaluation conducted by a UI specialist yielded two suggestions: implementing sequential scheduling to ensure that students finish their daily tasks before moving on, and incorporating gamification elements at different levels to enhance user motivation.

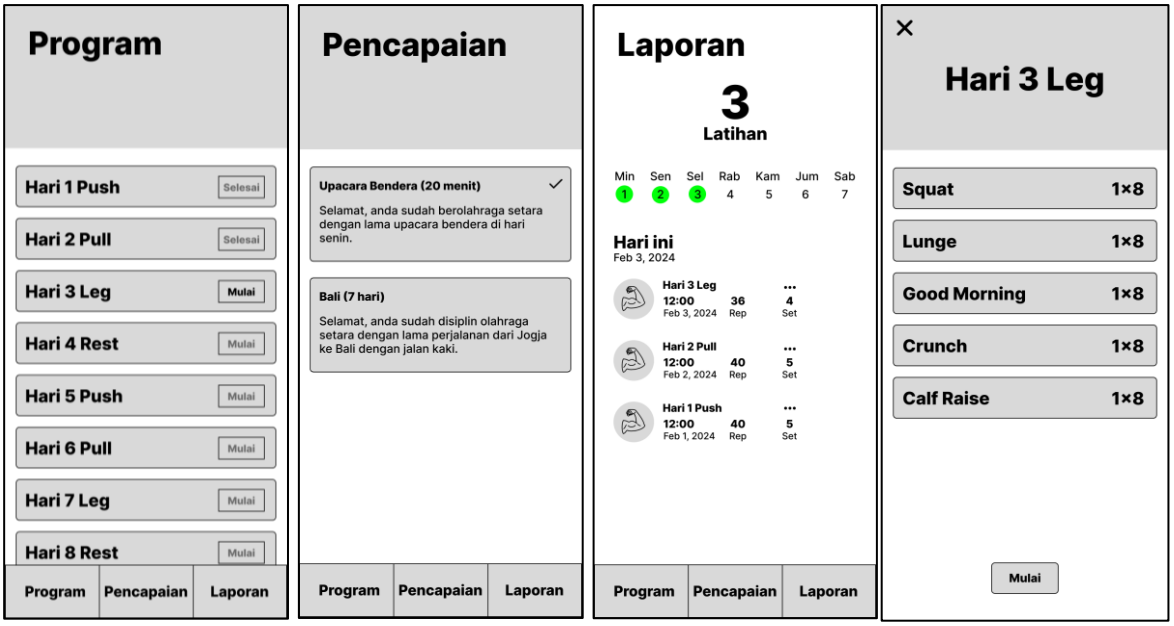

Figure 2. Kali Tech Interface Design Prototype (1) :
Program; Achievement (Pencapaian); Report (Laporan); 3 Days Leg (Hari 3 Leg)

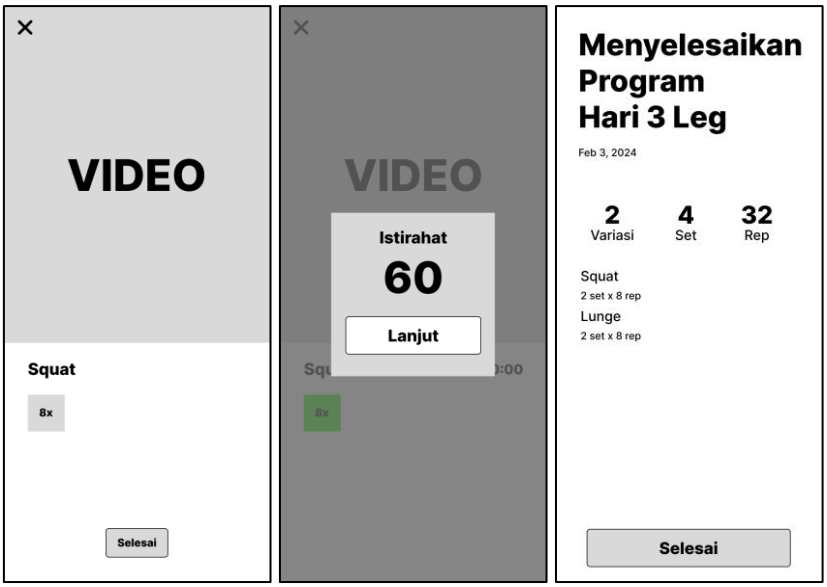

Figure 3. Kali Tech Interface Design Prototype (2) :
Video, Break (Istirahat); Program Summary (Menyelesaikan Program)

The revised Kali Tech Interface design can be seen in the high fidelity prototype (Figure 4 and Figure 5). Following an additional prototype test, the final implementation of the Kali Tech application is visible in Figure 6 and Figure 7.

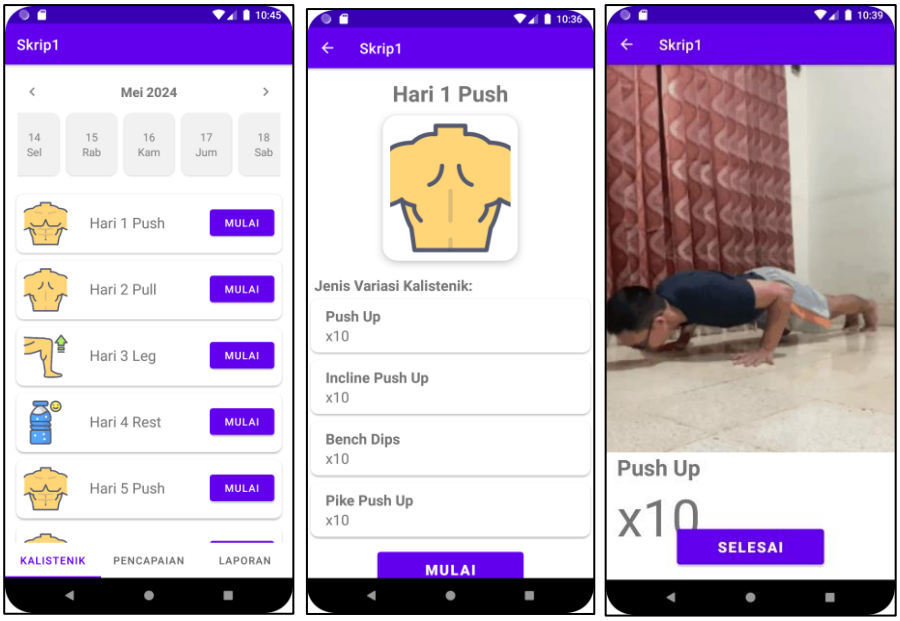

Figure 4. High Fidelity Prototype Kali Tech Interface Design (1)

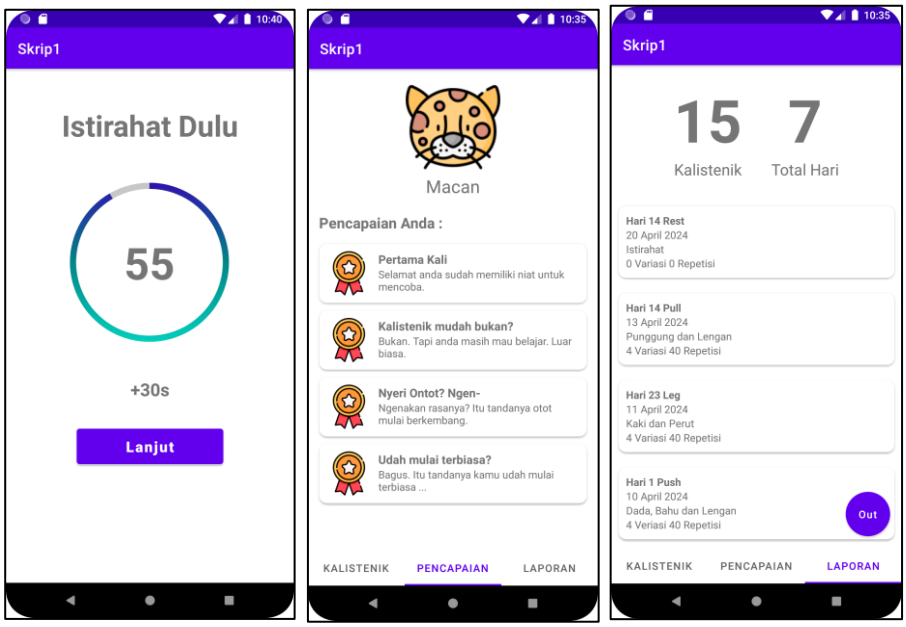

Figure 5. High Fidelity Prototype Kali Tech Interface Design (2)

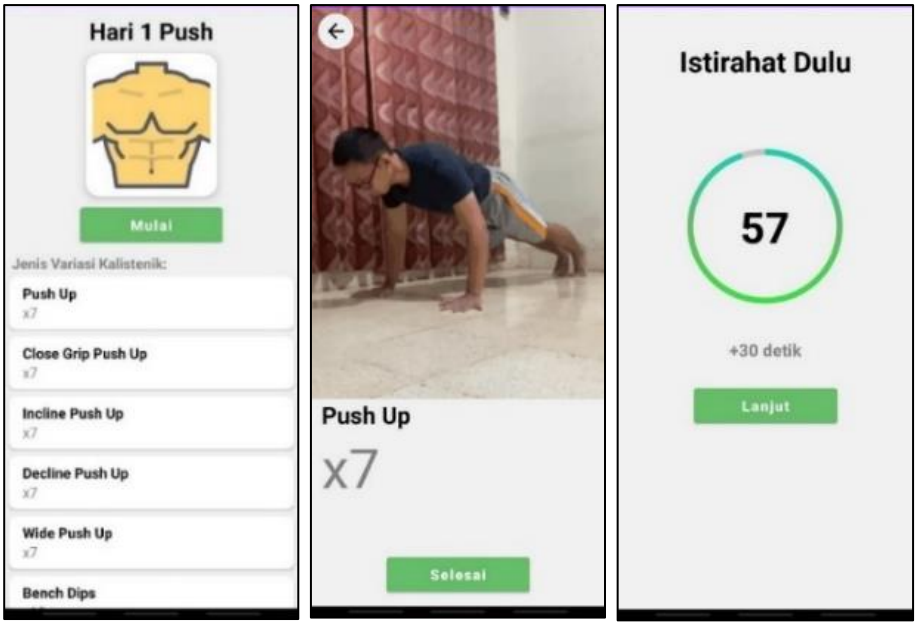

Figure 6. Kali Tech Interface Design Implementation (1) :
Day 1 Push (Hari 1 Push); Push Up; Take a Break (Istirahat Dulu)

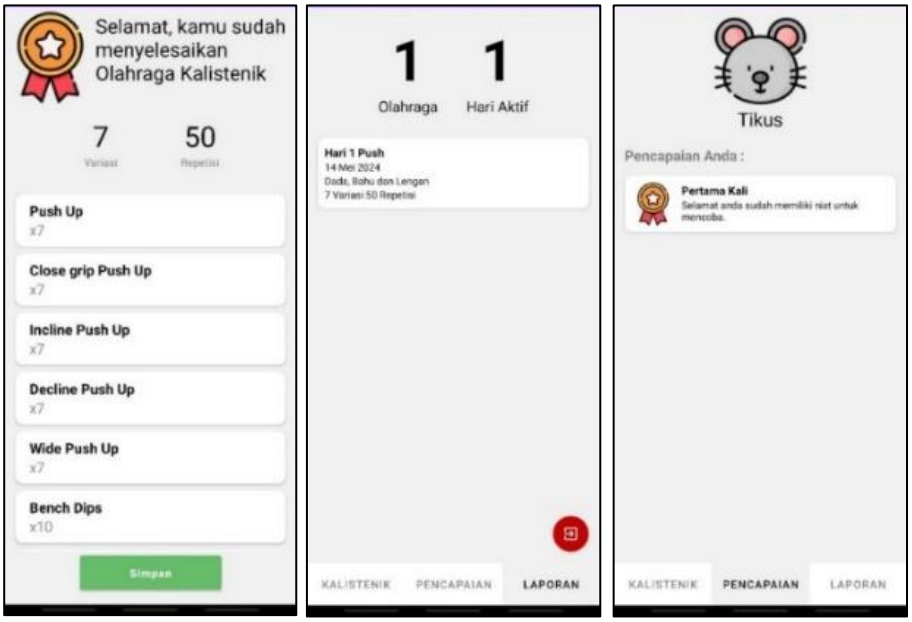

Figure 7. Kali Tech Interface Design Implementation (2) :
Congratulations (Selamat); Report (Laporan); Achievement (Pencapaian)

Enhancements were implemented to the scheduling feature in the application interface to enhance its sequential nature, remove any ambiguity, and improve regularity (Figure 8). The scheduling processes are organised in a methodical manner, enabling users to quickly and clearly follow the sequence. Consequently, the user experience is enhanced and becomes more streamlined in the management of their operations.

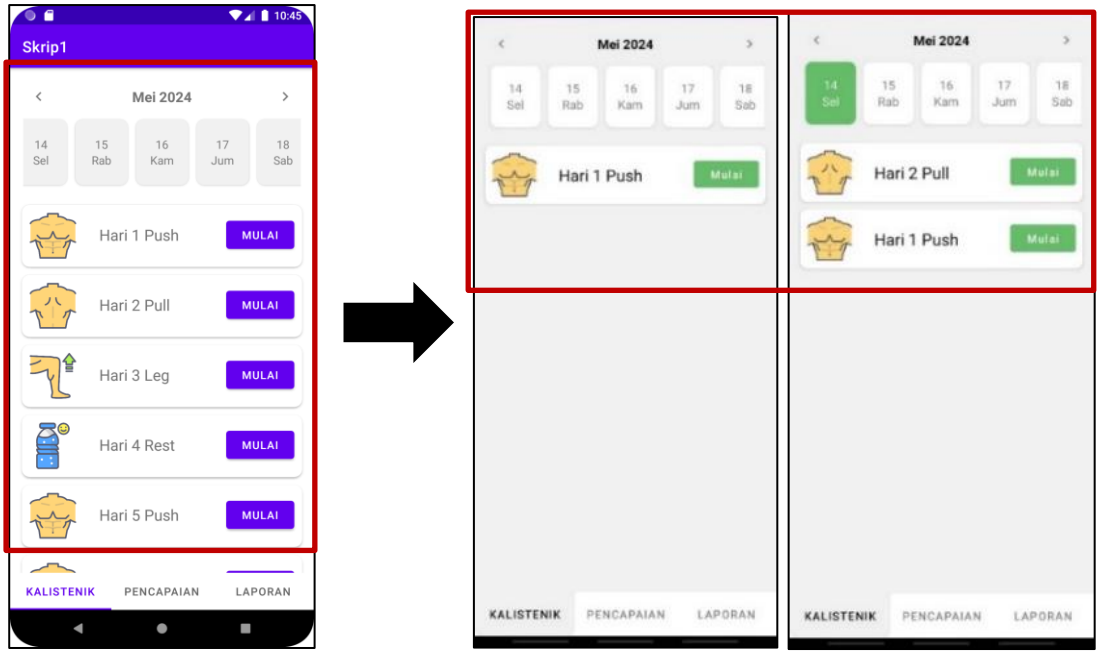

Figure 8. Scheduling Feature Improvements

4. RESULTS AND DISCUSSIONS

This application utilises the Firebase Authentication system to facilitate user login and registration (Figure 9). This procedure entails the validation of email and password, along with the verification of the email address and adherence to security regulations. Every user account is safely created using Firebase, and each account is assigned a unique Unique Identifier (UID) to facilitate efficient management of individual data.

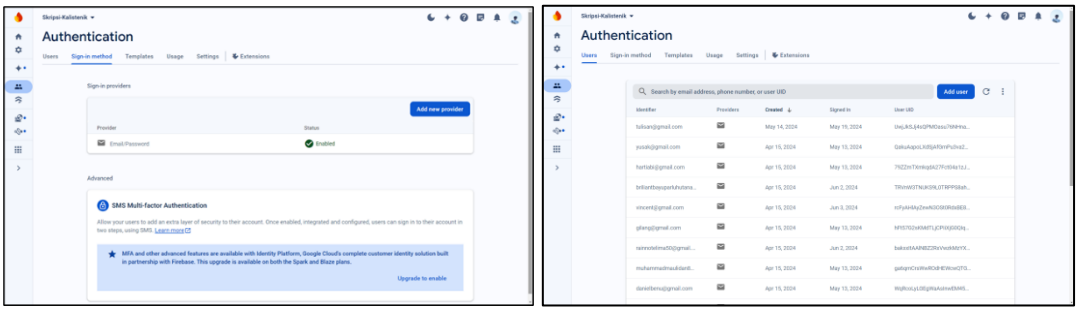

Figure 9. Firebase Authentication Implementation

The database structure in Firebase Firestore begins with a primary collection called 'user', which consists of documents that have distinct UIDs assigned to each individual user. Every UID document has a 'day' collection that stores comprehensive information about the user's daily activities, including details such as activities performed, emails sent, training days attended, repetitions completed, dates, and the corresponding UID that links to the parent document in the 'user' collection. This architecture facilitates organised and streamlined data administration within Cloud Firestore (Figure 10).

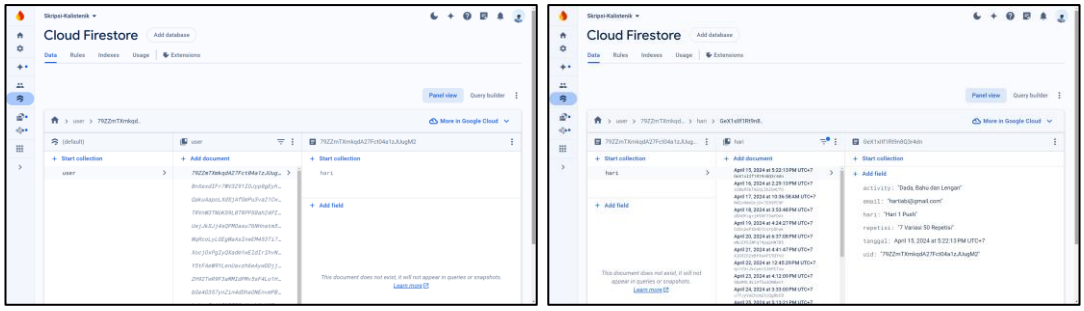

Figure 10. Firebase Firestore Iimplementation

The Kali Tech application has successfully completed the final phase of development, during which all its features and functionalities were enhanced. This was achieved by addressing faults in interface designing, taking into account feedback from respondents and user interface experts. In order to observe the ultimate manifestation of this application, presented below is the final form of this application.

The application underwent testing using the black-box testing methodology, which aims to assess the proper functioning of functions, discover interface flaws, evaluate data structures, assess database access, and find performance, initialisation, and termination issues. The objective is to guarantee that the application features operate correctly and in accordance with expectations [20]. The Kali Tech application underwent testing in three stages: interface testing, basic system function testing, and validation testing.

The interface testing phase verifies the proper functioning of all navigation buttons and features on the "Home Page," "Calisthenics Page," and "Achievements Page," including the validation of navigation, date display, videos, and timers. The primary objective of the system's basic functional testing is to verify the appropriate functioning of key features such as "Sports Activities" and "Achievements." This includes confirming that users' workout schedules, videos, timings, dates, and accomplishment levels are functioning correctly. Validation testing encompasses the verification of user input and system replies, which includes validating email addresses, passwords, navigation buttons, data storage, and achievement displays. Its purpose is to guarantee that user interactions and data integrity are executed seamlessly.

This study employs a callisthenic application interface as a research tool to enhance the physical fitness of students. The participants in the study were undergraduate students between the ages of 18 and 22 who were currently enrolled in academic programs. The number of respondents was determined using the summative sample size calculation method without estimation of variability [21]. With a confidence level of 80% and an effect size of 33% (based on [22]), the required number of respondents was 15 people per test group. Hence, the Kali Tech application underwent testing on a sample of 15 individuals in the experimental group, which was then contrasted to a control group of 15 individuals who did not utilise the program. The control group was chosen based on matching in age, height, and weight in order to minimise variability. A total of 30 participants were involved in testing the Kali Tech application. Data on blood pressure was obtained from both groups for a duration of 1 month for the purpose of analysis.

The Independent Sample T-Test is utilised to compare the blood pressure levels of two groups of samples that are not paired [23]. Prior to conducting statistical tests, it is necessary for the data to satisfy the assumptions of normality (where the data distribution adheres to a normal distribution) and homogeneity of variance (where the variability of data in the two groups is comparable). For the duration of one month, a total of 840 systolic samples and 840 diastolic samples were collected from 30 participants in this investigation. Table 1 displays the statistical data on blood pressure measurements from both groups where as Table 2 show the independent samples test result.

Table 1. Prior Research on The Use of Technology to Assist Physical Fitness

Group		N	Mean	Std.Dev.	Std.Error Mean
systolic	experimental group (using Kali Tech app)	420	116.28	8.506	.415
	control group	420	118.87	9.518	.464
diastolic	experimental group (using Kali Tech app)	420	73.65	7.648	.373
	control group	420	77.71	9.092	.444

Table 2. Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
						Significance				95% Confidence Interval of the Difference	
		F	Sig.	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
sistolik	Equal variances assumed	5.589	.018	-4.159	838	<,001	<,001	-2.590	.623	-3.813	-1.368
	Equal variances not assumed			-4.159	827.622	<,001	<,001	-2.590	.623	-3.813	-1.368
diastolik	Equal variances assumed	11.789	<,001	-7.002	838	<,001	<,001	-4.060	.580	-5.197	-2.922
	Equal variances not assumed			-7.002	814.125	<,001	<,001	-4.060	.580	-5.197	-2.922

The research revealed that the group utilising the program exhibited a statistically significant decrease in average blood pressure compared to the group that did not utilise the application, for both systolic and diastolic measurements. While the mean difference in systolic blood pressure between the two groups was not statistically significant, the diastolic group exhibited a substantial difference. Specifically, the group that did not utilise the program had a higher average blood pressure. Furthermore, statistical analysis utilising Levene's Test revealed significant disparities in the variability of systolic ($p = 0.018$) and diastolic ($p < 0.001$) blood pressure between the two groups. The t-test results indicated statistically significant disparities in the average systolic ($p < 0.001$) and diastolic ($p < 0.001$) blood pressure values between the two groups. The first group exhibited lower blood pressure levels on average compared to the second group (systolic: -2,590, diastolic: -4,060). The research concluded that there was a statistically significant disparity in blood pressure between the two groups, with the first group exhibiting lower blood pressure for both systolic and diastolic measurements.

This research employed non-probability sampling, utilising a questionnaire as an instrument to assess the effectiveness of gamification in application usage. Questionnaires are a prevalent instrument utilised in surveys to get data from participants. Analysis is conducted by the utilisation of descriptive techniques, employing measurements such as mean, median, mode, sum, maximum, and minimum to succinctly and precisely summarise and depict the properties of the data, thereby furnishing information regarding central tendencies and variations in the data [24]. This study assesses the influence of a gamification system on students engaged in sports activities using data collected via questionnaires. The questionnaire assessed five primary dimensions: usability, user-friendliness, attitudes, support for program usage, and involvement in sports inside the gamification system. Two statements are used to express each dimension, and participants are required to indicate their level of agreement with these assertions. The questionnaire results are displayed using graphs and descriptive data tables, which include statistical measures such as mean, median, mode, minimum value, maximum value, and total for each dimension.

The first dimension is usability aspect. The questionnaire results indicate that the implementation of a gamification system, incorporating levels and achievements, effectively enhances students' engagement in sports (Table 3). The respondents provided a mean rating of 4.40 for the first statement, suggesting a consensus in the growing interest in sports. The second statement, which has an average value of 4.33, indicates that gamification might enhance students' motivation to attain targeted results, despite disparities in how respondents perceive it. The findings validate the efficacy of the level and success gamification system in fostering students' interest and motivation in sports. This is consistent with studies that demonstrate the potential of games to enhance motivation and optimize learning outcomes [25]. However, additional examination is necessary to comprehend the precise aspects that impact students' perceptions of this system.

Table 3. Usability Aspect of Gamification

No	Quesition	Mean	Median	Mode	Min	Max	Sum
1	Implementing a hierarchical structure (level) and a system of accomplishments enhances my enthusiasm to excercise.	4.40	5	5	3	5	66
2	Implementing a levelling and achievement system enhances my motivation to attain the desired outcomes.	4.33	4	5	3	5	65

The second dimension is user-friendliness. The questionnaire results of the attitude dimension as shown in Table 4, indicate that the respondents usually provided a favourable evaluation of the gamification system's level and achievements in terms of flexibility (mean 4.53) and system interface/function (mean 4.47). The data suggest that respondents perceive this approach as both adaptable and comprehensible. The strong positive correlation between these values demonstrates the intimate association between the system's simplicity of use, adaptability, and clarity. These findings confirm the significance of incorporating user-friendly features in the implementation of

gamification and achievement. This can be further improved by gaining a comprehensive understanding of the specific components that impact user perceptions.

Table 4. User-friendliness Aspect of Gamification

No	Question	Mean	Median	Mode	Min	Max	Sum
3	I found the level and achievement system to be quite adaptable and user-friendly.	4.53	5	5	3	5	68
4	The purpose of this level and achievement system is evident and easily comprehensible	4.47	5	5	2	5	67

In terms of the attitude dimension, the majority of participants shown a favourable disposition towards the utilisation of gamification technologies to promote engagement in sports activities (Table 5). The study indicated a substantial consensus with the levels and achievements system, with an average rating of approximately 4.60 and both the median and mode being 5. The method successfully motivated pupils to complete the sport on schedule, as evidenced by a mean score of 4.53 for the impact on enthusiasm for the following level and achievements (Table 5). These findings highlight the significance of creating gamification components that enhance student involvement and the necessity for additional examination to comprehend the issues that impact their views towards gamification.

Table 5. Attitude Aspect of Gamification

No	Question	Mean	Median	Mode	Min	Max	Sum
5	I believe that implementing a system of levels and a accomplishments motivates me to successfully engage in physical activities..	4.60	5	5	4	5	69
6	I'm looking forward to the continuation aspects the level and achievement system offers.	4.53	5	5	3	5	68

The questionnaire findings on support for programme usage dimension, indicate that the implementation of the gamification system, which includes levels and achievements, in the application was well-received overall (Table 6). The average rating for the first statement was 4.13, while the second statement had a median and mode value of 4. While there were some differences in how the respondents perceived the situation, most of them reported an increase in both the use and willingness to engage in physical activity. This highlights the significance of providing application support in order to encourage users to actively engage and enhance their performance in fitness programs.

Table 6. Support for Programme Usage Aspect of Gamification

No	Question	Mean	Median	Mode	Min	Max	Sum
7	The levels and achievements system encouraged me to use the app.	4.13	4	4	3	5	62
8	The level system and achievements encourage me to exercise	3.93	4	4	3	5	59

Finally, the fifth dimension of involvement in sport, reveal that the implementation of the gamification system in terms of level and achievement leads to a significant rise in students' engagement in sports, with an average value of 3.73. The median and mode for the enjoyment of sports are both 4. This approach also promotes the acquisition of callisthenic skills, with a median and mode of 5. The results indicate that the majority of respondents have a favourable perception of the gamification system's ability to enhance participation and enjoyment of exercise (Table 7). Additional study is required to comprehend the precise factors that impact engagement, in order to strategise more efficient execution.

Table 7. Support for Programme Usage Aspect of Gamification

No	Question	Mean	Median	Mode	Min	Max	Sum
9	The levels and achievements system contributed to my enjoyment of the sport.	3.73	4	4	2	5	56
10	The level and achievement system encouraged me to learn callisthenic techniques.	4.40	5	5	3	5	66

This study also assesses the efficacy of the Kali Tech application in enhancing student fitness by analysing blood pressure data and exercise habits. The study observed the blood pressure records of college students over a period of one month in order to assess the extent to which the app contributed to obtaining and sustaining improved physical fitness. Figure 11 depicts a graphical representation of the blood pressure data for the group that did not utilise the application. The dashed crimson line represents the optimal range for systolic blood pressure, which is considered healthy and falls between 90 and 120 mmHg. Nevertheless, there were significant fluctuations in blood pressure among the participants, with a considerable number surpassing 120 mmHg and a few even approaching or reaching 150 mmHg.

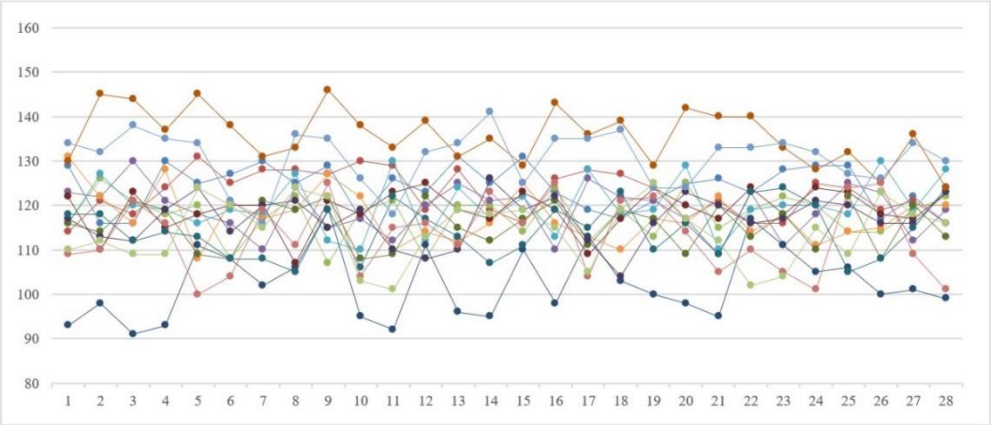

Figure 11. Systolic Blood Pressure From Control Group (Without Application)

Compared to the group that utilised the Kali Tech scheduling tool, the systolic blood pressure exhibited notable variations over the initial and subsequent weeks as a result of the body's adjustment to physical activity (Figure 12). During the third and fourth weeks, certain participants observed a reduction in blood pressure to a level below 120 mmHg, suggesting the restoration of normal blood pressure as defined by the World Health Organisation, which establishes the normal threshold as less than 135 mmHg. Nevertheless, a portion of the participants reported variations in the third week, potentially due to suboptimal utilisation of the program.

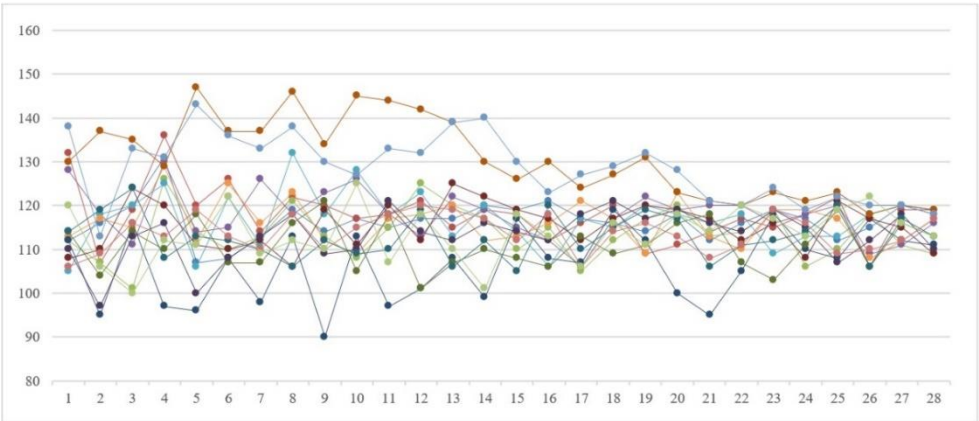

Figure 12. Systolic Blood Pressure From Treatment Group (Using Application)

Similarly, Figure 13 illustrates notable variations in the diastolic blood pressure of individuals who do not utilise the Kali Tech application, with data falling within the typical range of 60-80 mmHg. There is no discernible trend of declines or rises, only consistent swings. While, graphic visualization from the Kali Tech application (Figure 14) shows a pattern of decreasing diastolic blood pressure in respondents from the second to third week, although some are still outside the normal range of 80-60 mmHg. This indicates that some respondents have not reached the optimal level in exercise and application scheduling.

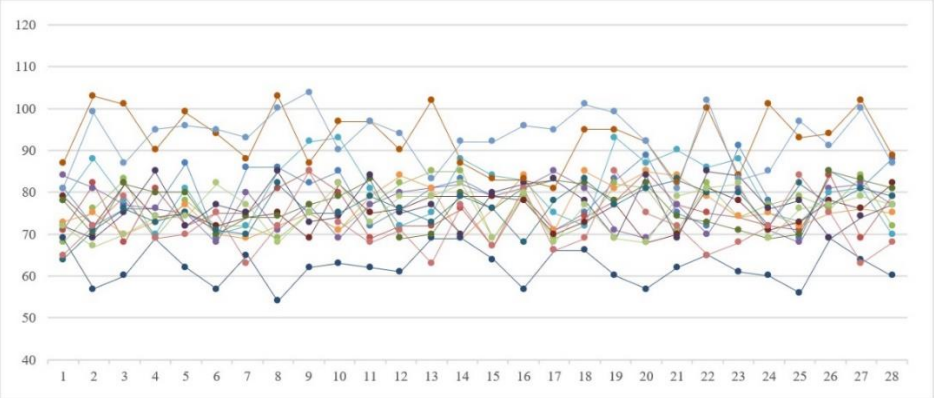

Figure 13. Diastolic Blood Pressure From Control Group (Without Application)

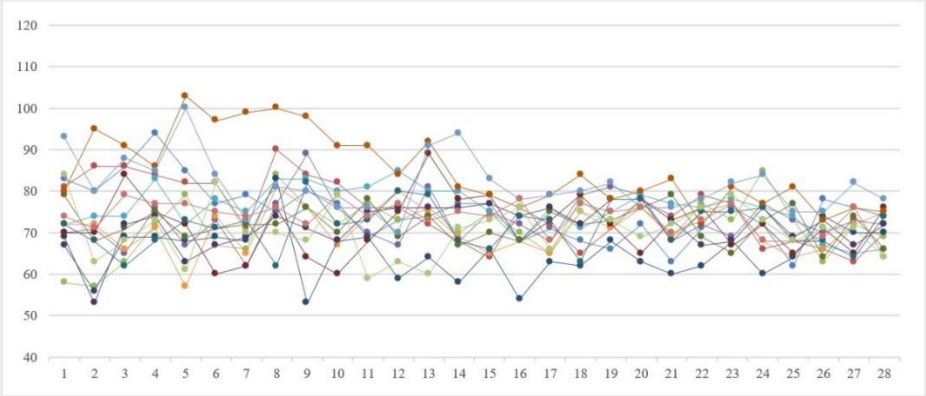

Figure 14. Diastolic Blood Pressure From Treatment Group (Using Application)

These results are in line with many studies which found blood pressure can be managed using pharmacological and non-pharmacological methods, including lifestyle modifications, music therapy, relaxation techniques, and exercise [26],[27],[28].

5. CONCLUSION

Based on the research conducted to evaluate the efficacy of the Kali Tech application in enhancing student fitness, particularly in relation to systolic and diastolic blood pressure, it can be inferred that this application has successfully aided students in improving their physical fitness through the inclusion of a well-designed callisthenic sports scheduling feature. This is supported by empirical evidence indicating that the individuals who utilised this application exhibited blood pressure levels that were in close proximity to the standard range during the third and fourth weeks of the research. It is important to acknowledge that in order to attain regular blood pressure readings, individuals must adhere to the prescribed regimen outlined by the Kali Tech program.

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AUTHOR CONTRIBUTIONS

Restyandito: Conceptualization, Supervision, Methodology, Formal Analysis, Validation, Writing – Review & Editing;
Narendra Poetra Wisnoewardhana: Application Developer, Data Curation, Investigation, Writing – Original Draft Preparation;
Danny Sebastian: Project Administration, Supervision, Writing – Review & Editing;

CONFLICT OF INTERESTS

No conflict of interests were disclosed.

ETHICS STATEMENTS

We confirm that informed consent was obtained from all participants involved in the research, ensuring that they were fully aware of the study's purpose, procedures, and potential risks. Participants were given the opportunity to ask questions and voluntarily agreed to participate, understanding their rights to withdraw at any time without penalty.

REFERENCES

[1] C. Rismayanthi, "Relationship between Flexibility with Balance in the Elderly Based on Clinical Pathophysiology," in *Proceedings of the 2nd Yogyakarta International Seminar on Health, Physical Education, and Sport Science (YISHPESS 2018) and 1st Conference on Interdisciplinary Approach in Sports (CoIS 2018)*, 2018, pp. 359–360. doi: 10.2991/yishpess-cois-18.2018.89.

[2] Y. B. O. Tapo, "Evaluasi Status Kebugaran Jasmani Dan Tingkat Penguasaan Keterampilan Olahraga Sepakbola Dan Bola Voli Mahasiswa PJKR semester V STKIP Citra Bakti Ngada Berdasarkan Aktivitas Perkuliahan Praktek dan Pembinaan Kegiatan UKM," *Ejurnal IMEDTECH*, vol. 4, no. 1, pp. 37–54, 2020.

[3] A. Hanif and A. Fuadin, "Olahraga Muscle Building Termurah Bagi Mahasiswa Cheapest Muscle Building Sport for Students," *Indones. Sport J.*, vol. 6, no. 1, pp. 1–6, 2023.

[4] S. A. D. Winarni, S. W. Basuki, and E. Herawati, "Pengaruh Uang Saku, Motivasi, Serta Durasi Belajar Terhadap Prestasi Belajar Mahasiswa Fakultas Kedokteran," in *National Symposium and Workshop Continuing Medical Education XIV*, 2021, pp. 1369–180.

[5] M. H. Sakinah, N. F. A. Malek, A. K. Thariq Khan, A. Ishak, H. A. Hashim, and K. C. Chee, "The Effect of 12-Week Calisthenics Exercise on Physical Fitness among Obese Female Students," *Phys. Educ. Theory Methodol.*, vol. 22, no. 3s, pp. S45–S50, Nov. 2022, doi: 10.17309/tmfv.2022.3s.06.

[6] L. M. da S. Chaves, G. V. Santos, C. L. S. Teixeira, and M. E. Da Silva-Grigoletto, "Calistenia e exercício com o peso corporal: conceitos distintos ou sinônimos científicos?," *Rev. Bras. Fisiol. do Exerc. cio*, vol. 19, no. 1, pp. 13–15, Feb. 2020, doi: 10.33233/rbfe.v19i1.3985.

[7] S. Bose, A. Kundu, M. Mukherjee, and M. Banerjee, "A Comparative Study: JAVA vs Kotlin Programming in Android Application Development," *Int. J. Adv. Res. Comput. Sci.*, vol. 9, no. 3, pp. 41–45, Jun. 2018, doi: 10.26483/ijarcs.v9i3.5978.

[8] V. Singh and A. Singh, "Digital Health Revolution: Enhancing Well-Being Through Technology," 2023, pp. 213–219. doi: 10.4018/979-8-3693-2065-5.ch016.

[9] A. Kuzmik, M. Rodriguez, J. Hannan, and M. Boltz, "Designing a mobile application to promote physical activity in spousal care partners of persons living with dementia and their care-recipient," *Dementia*, Aug. 2024, doi: 10.1177/14713012241272878.

[10] F. T. Swandi, Restyandito, and K. Adi Nugraha, "Analisa Usability Desain Aplikasi Controlling Calories untuk Mendapatkan Berat Badan Ideal," *JNANALOKA*, pp. 19–26, Mar. 2023, doi: 10.36802/jnanaloka.2023.v4-no01-19-

26.

[11] D. I. P. Sari, Restyandito, and K. A. Nugraha, "Perancangan Aplikasi Monitoring Kalori Sebagai Upaya Pencegahan Penyakit Diabetes Mellitus Berbasis Android," *J. Tek. Inform. dan Sist. Inf.*, vol. 8, no. 1, pp. 131–141, 2022, doi: 10.28932/jutisi.v8i1.4301.

[12] C. A. Figueroa, L. Gomez-Pathak, I. Khan, J. J. Williams, C. R. Lyles, and A. Aguilera, "Ratings and experiences in using a mobile application to increase physical activity among university students: implications for future design," *Univers. Access Inf. Soc.*, vol. 23, no. 2, pp. 821–830, Jun. 2024, doi: 10.1007/s10209-022-00962-z.

[13] G. Andronache and L. Aciobănitei, "DAnke - An Application for Promoting a Healthy Lifestyle Using Gamification and Blockchain," in *2024 IEEE 18th International Symposium on Applied Computational Intelligence and Informatics (SACI)*, May 2024, pp. 000365–000370. doi: 10.1109/SACI60582.2024.10619826.

[14] A. R. Pamungkas, N. P. N. Wijayanti, A. Vai, and I. Ittaqwa, "Development of Smartphone-Based Athlete Physical Fitness Applications During Work From Home," *J. Coach. Sport. Sci.*, vol. 1, no. 1, pp. 18–27, Jul. 2022, doi: 10.58524/jcss.v1i1.107.

[15] A. Suherman, N. I. Rahayu, Jajat, and K. Sultoni, "The Development of Physical Fitness Application Based On Information And Communication Technology For Higher Student," *J. Eng. Sci. Technol. - Spec. Issue ISCoE2022*, pp. 27–38, 2022.

[16] S. Suwarno and D. Derrick, "Rancang Bangun Aplikasi Latihan Fisik untuk Pemain Basket," *Comput. Based Inf. Syst. J.*, vol. 10, no. 1, Mar. 2022, doi: 10.33884/cbis.v10i1.5454.

[17] Y. Dharmawan, S. Suroto, and P. S. Putra, "Web-Based Application to Support Physical Fitness Information of Elderly People," *Kesmas Natl. Public Heal. J.*, vol. 13, no. 1, Aug. 2018, doi: 10.21109/kesmas.v13i1.1448.

[18] T. P. Zulfachmi, "Survey Paper: Perbandingan Metode Pengembangan Perangkat Lunak (Waterfall, Prototype, RAD)," *J. Penelit. Sekol. Tinggi Teknol. Indones. Tanjung Pinang*, vol. 1, no. 1, pp. 6–12, 2021.

[19] M. Madiah, K. X. Ng, Y. W. Tan, Z. H. Tan, Z. T. Chong, and J. X. Chan, "Wix for Web Development and the Application of the Waterfall Model and Project Based Learning for Project Completion: A Case Study," *J. Informatics Web Eng.*, vol. 3, no. 2, pp. 212–228, Jun. 2024, doi: 10.33093/jiwe.2024.3.2.16.

[20] M. Nurudin, W. Jayanti, R. D. Saputro, M. P. Saputra, and Yulianti, "Pengujian Black Box pada Aplikasi Penjualan Berbasis Web Menggunakan Teknik Boundary Value Analysis," *J. Inform. Univ. Pamulang*, vol. 4, no. 4, pp. 143–148, 2019.

[21] J. Sauro and J. R. Lewis, *Quantifying the user experience: Practical statistics for user research (2nd Edition)*. Morgan Kaufmann, 2016.

[22] G. Salvendy, *Handbook of Human Factors and Ergonomics (4th Edition)*. John Wiley & Sons, 2012.

[23] Restyandito and K. Adi Nugraha, "The Effectiveness of Button Size on Mobile Device Based on Hand Dimension," *Lect. Notes Eng. Comput. Sci.*, vol. 2228, pp. 916–920, 2017.

[24] L. Mosalanejad, S. Abdollahifard, and T. Abdian, "Psychiatry gamification from blended learning models and efficacy of this program on students," *J. Educ. Health Promot.*, vol. 9, no. 1, p. 68, 2020, doi: 10.4103/jehp.jehp_352_19.

[25] A. H. Mohamad Zainurin, A. B. Junit, F. A. Muhammad, L. Manoharau, and M. F. Mohd Herrow, "HIRE ME!: Interactive Gaming Simulation as a Teaching Aid to Enhance English Speaking Skills Among UTHM Students," *Int. J. Creat. Multimed.*, vol. 5, no. 1, pp. 32–54, Apr. 2024, doi: 10.33093/ijcm.2024.5.1.3.

[26] Ş. Alpsoy, "Exercise and Hypertension," in *Physical Exercise for Human Health. Advances in Experimental Medicine and Biology*, J. Xiao, Ed. Springer, Singapore, 2020, pp. 153–167. doi: 10.1007/978-981-15-1792-1_10.

[27] M. Kazeminia, A. Daneshkhah, R. Jalali, A. Vaisi-Raygani, N. Salari, and M. Mohammadi, "The Effect of Exercise on the Older Adult's Blood Pressure Suffering Hypertension: Systematic Review and Meta-Analysis on Clinical Trial Studies," *Int. J. Hypertens.*, vol. 2020, pp. 1–19, Sep. 2020, doi: 10.1155/2020/2786120.

[28] D. Julistyanissa and C. Chanif, "Penerapan Brisk Walking Exercise Terhadap Perubahan Tekanan Darah Penderita Hipertensi," *Ners Muda*, vol. 3, no. 3, Dec. 2022, doi: 10.26714/nm.v3i3.10535.

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