Design of APP for College Students' Fitness Running
based on Android

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ABSTRACT

At present, the decline of the college students' life quality has become an accepted fact. More and more students ignored the necessary physical exercise in college students' life which leads to deteriorate health condition of the students. Fitness running is a major form of exercise for all people. How to better record, monitor and evaluate college students' sports status? Exercise can be enforced and supervised. To solve this problem, a fitness running system that monitors and evaluates the health of students is designed in this paper. In this paper, the main contents are as follows:

a) The reason for the design of a fitness system for college students are briefly illustrated
b) The design of App client for fitness running
c) The administrator web page design

INTRODUCTION

At present, the decline of the college students' life quality has become an accepted fact [1]. Parent and students in our country always pay attention to basic education. More and more students and parents neglect physical exercise in college students' life because of learning tension, lacking of interest in sports and campus facilities. So students are lack of exercising by these reasons. In order to improve the life quality of students, some researchers have proposed the idea that forcing students to exercise. School should force student to exercise by scoring daily exercise. I choose fitness running as the assessment physical training project because fitness running is a major form of exercise for all people without restrictions of area and population. The mark of daily exercise will be added to the final score of sports. The final score will influence the graduation of students. Students have to do daily exercise for getting a high grade. Teachers should supervise students’ daily exercise because teachers should scoring students’ daily exercise and the score is important. There are two ways to supervise. The first, using artificial attendance punch method. Students do daily exercise based on a
fixed time and a fixed route and supervised by teacher through attendance punch. The second, students’ daily exercise behavior is recorded by fitness running app. Teacher can scoring students’ daily exercise by the data updated from Mobile phone app through web page. If taking the first method to supervise, school will spend extra money on the purchase of additional equipment and manual labour. At the same time, there are restrictions on the exercise time of students. If taking the second method, the cost of supervision will cheaper and students do daily exercise will more freedom [2]. Designing this App is based on the reasons above.

SYSTEM DESIGN
System structure design

![Figure 2-1. Fitness running system diagram.](image)

As seen in Figure 2-1, students use the APP mobile terminal. Teachers use web pages. The registration of student will be uploaded to the cloud after completion of the information registration. Teachers use web pages to access the cloud through the Internet to view student information that has been registered. Students start running as recording the path, distance, speed, and time while students can view the path record of running on the mobile phone. （Mobile phone statistics students record effective conditions for speed less than 12 meters per second, while the phone has a larger shake）. Teachers use web pages to look at the running conditions of each student, including total distance, average speed, and total time consuming. You can also look at the average time spent, average speed, and average time spent by all students on a daily, weekly, or monthly basis. Teachers can also publish tasks to students on the web page and students will receive tasks on the mobile terminal and perform the tasks.

Design and analysis of App architecture for fitness running

In order to better explain the APP part of the design, in addition to the module
diagram of App (Figure 2-2). The requirements map of App (Figure 2-3) is also provided to assist in a clearer explanation.

You need to fill in this information: student number, name, password, height, weight, gender, mobile phone number when you are registering. Student ID is in order to be better to protect students’ personal privacy. The password is for authentication during login. Height, weight, and gender are calculated for BMI (Body Mass Index) [3]. BMI=weight(kg)/height^2(m) (see TABLE I). It is index to reflect physical condition. It is also one of the national students’ health indexes. You can have a password recovery by Mobile phone number for a personal identity if you forget the password in the future.

Figure 2-2. App structure diagram.
The second is the running record module, which is implemented in combination with GPS technology [4] and BaiduMapSDK [5] technology. The running record has two modes of running, free running, and prescribed route running. The difference is whether the running path is specified. The rules for running, taking into account the safety of students, avoid such things as "crossing the road". It is fixed routes and fixed points. When students start the running record function, it records the time at the same time. It also start to refresh location point every 5S through GPS. Locating the dots on Baidu maps and linking them up is the

<table>
<thead>
<tr>
<th></th>
<th>WHO standard</th>
<th>Asian standard</th>
<th>China Standard</th>
<th>Risk of related diseases</th>
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<tbody>
<tr>
<td>Too slim</td>
<td>&lt;18.5</td>
<td></td>
<td></td>
<td>Low (but increased risk of other diseases)</td>
</tr>
<tr>
<td>Avg</td>
<td>18.5-24.9</td>
<td>18.5-22.9</td>
<td>18.5-23.9</td>
<td>average level</td>
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<td>≥23</td>
<td>≥24</td>
<td>increase</td>
</tr>
<tr>
<td>Too fat</td>
<td>25.0~29.9</td>
<td>23~24.9</td>
<td>24~27.9</td>
<td>increase</td>
</tr>
<tr>
<td>Obesity</td>
<td>30.0~34.9</td>
<td>25~29.9</td>
<td>≥28</td>
<td>Moderate increase</td>
</tr>
<tr>
<td>Severe obesity</td>
<td>35.0~39.9</td>
<td>≥30</td>
<td></td>
<td>Serious increase</td>
</tr>
<tr>
<td>Very severe obesity</td>
<td>≥40.0</td>
<td></td>
<td></td>
<td>Very serious increase</td>
</tr>
</tbody>
</table>
current running path. The distance between points and points is converted according to the Mars mapping coordinate and the total path distance is accumulated. The total path distance is divided by the statistical time, which is the mean speed.

The detected data is needed uploaded and the way of data uploading is required. 30 times of refreshing location is a package cycle. Every cycle, message is uploaded to the cloud. Here is a filtering of the data. It must meet the requirement that the average speed must be greater than 1.5m/s (walking speed) and the average speed is less than 16m/s (human limit speed) within one cycle [6]. The data of fitness running is related to the final sports score. Students have to do exercise with this app. Some students don’t like taking exercise. So, they may use bicycle instead of running to get the data of daily exercise. So, the anti-cheat function is needed. If there is no major shock in 30 seconds and the moving distance is over 50m, the exercise data will not to upload [7]. If there is no data transmission to the server in the two package cycles, then the fitness has been stopped.

The third module is the running record view module. You can see the user in the past run the path, time, distance and other statistics, as well as for all users ranking function. The rankings are based on distance, time, and average speed. The user to view the running record, first to access the cloud database to see running records, according to the running time set location record of the acquisition in running. The positioning point shows and be connected in Baidu maps. After that, it can display the running path to the user.

The interactive modules have two main functions: receiving and completing the tasks assigned by the teacher, sharing their fitness status. Teachers release tasks and there will be tips on the App. Students can receive training tasks. Students can complete the task after completing the fitness running as required. Fitness running App has attendance mechanism. You can sign in after each workout. App records consecutive attendance records. You can share it with friends. Share your joy and attract friends to join you in the fitness exercise [8].
Design and analysis of administrator's architecture

Teachers login to the administrator by web. The following three operations can be carried out, view information, evaluate, issue tasks [9](Figure 2-4).

You can view the information of a single student. Looking at the information of a single student’s total running distance, total time, average speed by daily, week, month, semester. The teacher can releases tasks. Teachers can set tasks such as distance, such as: how much distance do you should run. Teachers can also revoke the release of the task. You can set the end time of the completion task [10].

CONCLUSIONS

In order to improve college students' life quality, school forces students to exercise by scoring daily exercise. The mark of daily exercise will be added to the final score of sports and influence the graduation. Students have to do daily exercise for getting a high grade. Compared to supervise by manual labor, recording daily exercise by app is cheaper and more convenient. By the mobile phone records of students jogging, teachers can score students’ daily exercise through browser. At the same time, teachers can also develop different exercise plans for different students (due to sex, major in sports or others).

REFERENCES


