A MOBILE APPLICATION FOR ORIENTEERING EVENTS IN PHYSICAL EDUCATION SUBJECTS

J. Metrolho¹, F. Ribeiro¹, E. Fonseca², L. Machás², A. Dias³

¹R & D Unit in Digital Services, Applications and Content - Polytechnic Institute of Castelo Branco (PORTUGAL)
²Polytechnic Institute of Castelo Branco (PORTUGAL)
³Agrupamento de Escolas José Sanches e S. Vicente da Beira, Alcains (PORTUGAL)
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Abstract

• Physical education in schools aims to promote physical activity, socialisation, and interaction among students.

• Orienteering is a sport modality that integrates physical, cognitive, and emotional dimensions. It consists, as the name implies, of navigating to a certain area, using a map and a compass, aiming for the shortest possible route between several points marked on a map.

• The work described in this paper presents a case of the introduction of new digital technologies in this modality to simplify the administration of these events in a school environment and to promote interest in the practice of this sport modality.

• The web application that allows the creation and addition of the orienteering event, the visualisation of detailed information in an after-event context, and the registration and management of new organisers or orienteers is presented throughout the paper.

• A mobile application that allows the organisers to start and finish events, manage orienteers of a given event, view the current position of orienteers, and view the results of past events. The mobile application presents a static orienteering map to the orienteer. The visit of the orienteer to each control point (assigned on the orienteering map by the organisers) is verified using the georeferencing features of the device.

• These tools facilitate the management of these events by organisers as well as their analyses through automatically generated information. It also makes the practice of this modality more appealing to students because it introduces a type of gamification.
Introduction

• Orienteering events and activities have been receiving increasing attention. Currently, they are widely practised in physical education classes at schools. Proof of the growing interest that these activities have attracted is the numerous studies that have been done that study the practice of these activities by students and children.

• Managing orienteering events can be hard work, and without the support of computer tools, organising orienteering events can be complex, especially when attendance is high. It is necessary to plan the event, define the control points on the ground, prepare orienteering maps, manage the events, register the orienteers, measure and analyse the results, and so on.
Introduction

• It is important to be able to obtain statistical information automatically and reliably about the orienteering events and orienteers, including the location of each orienteer in real time. This last consideration is particularly important when orienteers are students. It is also important to make the practice of this activity more appealing to students. To do so, the inclusion of some type of gamification and the use of mobile applications can play an important role.

• The paper describes a case of using new digital technologies in orienteering events to simplify the administration of these events in a school environment and to promote interest in the practice of this sport modality.
Goals

• Mobile application should meet the following high-level requirements
  • Allow organisers to do the following:
    • View events that have already occurred and the statistical information about them;
    • Edit events and related information;
    • View the status of each orienteer during an event;
    • Start events.
  • Allow orienteers to do the following:
    • Start attending an event and bookmark visited places;
    • View information about the events they already attended.
Goals

• The back-office application should meet the following high-level requirements:
  • The system should allow the administrator to manage the organisers.
  • The system should allow organisers to manage their orienteering events, namely:
    • Create events by marking control points and their features on the map;
    • Schedule their events;
    • Manage orienteers in their events;
    • View the status of each orienteer during an event;
    • View statistical information about their events and the teams participating in them;
    • View events that have already occurred and statistical information about them.
  • As non-functional requirements, all the mobile devices must have the Android operating system (OS) (version 5 or later) and GPS functionality with wi-fi or active data communication.
Development

• Orienteering Event Administration

Setup of the control points for a new orienteering event.
Development

- Orienteering Event Administration

Total results of an event and for a specific orienteer (left).
The path that the specific orienteer took during the event (right).
Development

• Orienteers and Organisers: Mobile Application

The organiser defines the users who will be allowed to participate (left). The organiser consults the information about the location of the orienteers (centre and left).
Development

• Orienteers and Organisers: Mobile Application

Total results GUI (left). Orienteer using the map (top right). Popup for the orienteer to check the control point (bottom right).
Preliminary Results

• Experiments were conducted (involving a physical education teacher with extensive experience in orienteering classes) to gain a sense of what the overall experience would be. The developed application was used by four orienteers in a test event (with three control points). Throughout the event, the physical education teacher was asked for feedback on the overall application design, functionality, reliability, and so on.

• So far the feedback was completely positive.
CONCLUSION

- The paper presents an application (web back-office and Android mobile application) designed to be used in orienteering events in physical education. Using a mobile device running the Android OS, orienteers have access to the orienteering map and can confirm control points using the GPS feature of their devices. This feature makes physically marking the control points unnecessary and gives organisers full flexibility to configure them. The application also allows organisers to monitor orienteers during the events and gives them access (before, during, and after) to a vast dataset. The GUIs are simple and intuitive (according to the opinion of the teachers with experience in organising such events and the orienteers who have already tested it). After being used in preliminary trials, feedback on the performance of the software application was very positive.
Some Future Work

• As future work, it is planned to introduce some filters to make it easier to assign orienteers to events when the number of orienteers is large.

• Since target users are students, it is important to add features that make the user experience more attractive and more motivating. For this, new features, such as the inclusion of new activities to be performed at the control points, will be studied.

• A more thorough assessment is expected to be made at events taking place within physical education classes. This feedback may eventually lead to new features or improvements to some of those features that are already available.