An Audience Response System with iGoogle Gadgets Using Mobile Devices

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Abstract: Currently, Audience Response Systems (ARS) are integrated widespread on face-to-face classes to improve the attendance and engagement of the students. In this paper, we present the current trend of using Web 2.0 to provide ARSs and our efforts to create a complete ARS over the iGoogle platform. We created a dedicated gadget to be used by the students as the traditional remote control system, which can be operated from any device with a Web browser (e.g. laptops, tablets or smartphones). With our approach, teachers can use gadgets to compose and make in-class polls or questionnaires and check the responses on-the-fly.

Keywords: Audience Response Systems, iGoogle, gadget, Web 2.0

Introduction

Audience Response Systems (ARSs) allow teachers to inquire learners during the course of classroom activity electronically. The basic operation of these systems involves the distribution of remote controls to the learners. Then, teachers may ask questions and learners provide their answers using the remote devices. Usually questions are shown to the students using a beamer. Learners' responses are collected by a system that process the information and offers a summary of the results. This system is usually accessible from the teachers' computer. This way, the teacher can get the results immediately and can vary his/her discourse or the classroom activities accordingly.

We present in this document our work for supporting an ARS over iGoogle [1]. We have developed a set of gadgets that provide ARS functionalities to users. Teachers may create and activate polls from his/her personal iGoogle page and students may answer, from their personal iGoogle page, using the device they want as remote control (e.g. laptop, tablet or smartphone).

1. Pi2E Project

1.1 Phylosophy

The Pi2E Project [2] aim is to provide an e-learning system via iGoogle [1]. iGoogle allows users to compose their own personalized home-pages, using gadgets and info sources that they organize in the screen as they prefer. Users have also available the well-known Google Web services, such as Google Search and Google Talk. The Pi2E approach is that the user can make use of these applications and gadgets to create his/her own e-learning

environment. In addition to the general-purpose gadgets we have developed some e-learning specific gadgets to facilitate certain tasks.

We chose iGoogle home-page system because it offers a free service to any user with a Google account. It also offers its own set of gadgets, but anyone can add new gadgets from any page or repository (e.g. ROLE widget store [3]). In addition, users can also take advantage of the several presentations flavours available in iGoogle. Gadgets can be offered through smartphones and digital TVs. When the personal home page is accessed from a smartphone it is shown in a different way than usual to adapt to the reduced space. In this case we provide a multi-device and ubiquitous service easily.

The Pi2E specific e-learning gadgets that we have been developing provide functionalities related with the management of educational activities. We consider that learning plans involve a set of activities of different types that have to be carried out. For example: lectures, assignments, questionnaires, debates, etc. Therefore, we have taken some gadgets already available in iGoogle and developed some new gadgets to provide functionalities supporting these activities and mainly the management of these activities. Each gadget provides just a specific functionality and the whole e-learning environment can be achieved through the composition of several gadgets. Some of these gadgets may require a Web service that provides the contents or some storage capability. Therefore, we have also developed some Web services that support the provision of gadget functionalities.

Up to date, we have developed four specific gadgets for Pi2E [2,4]: Edu-GAM, Edu-GAAT, Edu-GAL and Edu-GAR. These gadgets are provided for different kind of users within the educational process: author of learning activities and lesson plans, teacher and student. Next sections provide a brief introduction to these gadgets while the rest of the paper focuses on Edu-GAR.

2. Edu-GAR

Edu-GAR (Educational – Gadget Audience Response) is the latest gadget we have created in Pi2E. Its purpose is to emulate the operation of a remote device in an ARS. In other words, it just enables students to answer questions that are issued by a teacher during the class. Other Pi2E gadgets support this functionality. Edu-GAAT must be used by the teacher to create the questions. Edu-GAM must be used also by the teacher to activate the questions and to view the (statistical) results.

1.1. Edu-GAR in Action

Edu-GAR was designed to be used by students during the class. It was developed using the Edu-GAL gadget as a reference, but in a simpler way. The teacher can activate or deactivate questions. Questions are shown to the students when they are active and then students can answer questions.

Unlike conventional remote controls, Edu-GAR involves a proactive behaviour. While remote controls just send answers to the receiver when the student push the button, Edu-GAR must periodically poll the server to check if a question is available. Then, the gadget shows to the student the question with the possible answers and waits until the student provides his/her result. Then, the student answer is sent to the server.

Edu-GAR can display not just single questions but complete questionnaires with several questions. Indeed, Edu-GAR supports IMS QTI [5] question types.

3. Conclusions

The ARS solution implemented in Pi2E gadgets differs from traditional ARS systems in two main ways. First, students can answer the questions using several devices. Moreover, they are shown the questions and answers in their personal device and not just in the classroom screen. Second, student answers can be recorded for future analysis. This way, the teacher has a new instrument to assess his/her students.

In addition, Edu-GAR also involves some other advantages. Traditional ARS systems just allow users to answer one question each time. The question is a multi-choice type, and it requires the user to choose one option out from several available ones. Using Edu-GAR the teacher can include several questions in a row and several question types are available.

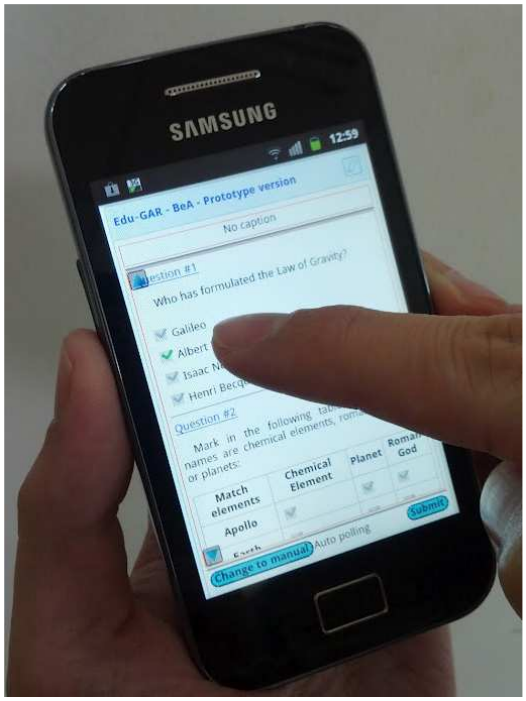

Figure 1. Student using Edu-GAR on a smartphone

Edu-GAR shares the advantages of Web-based ARS systems. The service cost is reduced, more devices can be used to answer the questions and students are less likely to forget their remote devices at home.

There are some aspects that need to be taking into account using this technology. As a Web-based system, it depends on the availability of a good Internet connection. In case the connection is damaged the users may not receive the questions or they answers may not be saved. In addition, the system has latency. Therefore, it is not suitable for fastest finger test types. It is also important to note that a student can answer the questions from anywhere, not just from the classroom. If this can be a critical issue, then some mechanism could be implemented, such as location filtering.

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