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WEB APPLICATION FOR READING PRACTICE

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Abstract

This article presents a didactic web application for reading practice which deals with Basque. The main objective of the application is to offer an alternative and dynamic way to work on reading practice, and also to promote interaction between users while reading texts. For this purpose, the framework gives users the opportunity to upload texts and share question-answering exercises rather than offering static courses. Helping tools such as a chat module, a module to read and write text reviews and dictionaries are also integrated in the application to help users during the reading task.

Keywords

Basque reading practice, text and exercise sharing, personal and peer reading practice, user interaction, dynamic exercise generation.

1. INTRODUCTION

Nowadays e-learning applications play an important role and can face with multiple learning methodologies, such as: self learning, peer learning or supervised learning. In addition, they can offer a wide range of advantages to both teachers and students. As an example, users can easily adapt their timetable, geographical issues are completely avoided, teachers' workload is reduced by making use of automatized tools; and not only that, but also broader geographical cooperation makes it possible to obtain more diverse content.

This article presents a Basque reading practice framework prototype which focuses on text and exercise sharing. Whereas most resources offer static content, the developed framework utilizes user provided texts as source of data, and applies natural language processing techniques to generate question-answering exercises. In order to help on the creation of exercises, the framework benefits from the work done by an automatic question generator (AQG) which extends question making tasks. Thus, the whole framework is a semi-automatic application where the importance of users is noticeable because they add new content and supervise the automatically generated one.

The framework is divided into two main areas: the reading practice area and the file administration panel. On the one hand, the reading practice area lets users practice with Basque texts, and on the other hand, the file administration panel lets users administrate texts and exercises and provide content to the framework. Concerning user functionalities, visitors are able to access the reading practice area and registered users are able to access both, the reading practice area and the file administration panel.

Section 2 shows the general usage of the reading practice area, section 3.1 describes the file administration panel, section 3.2 introduces the automatic question generator system, section 4 shows the performed experiment and finally, section 5 exposes conclusions and future work.

2. READING PRACTICE AREA

The main objective of the application is to let users practice with texts in order to improve their skills within Basque. To perform this task, the framework first gives users the chance to read texts, and, after that, proposes questions asking about concepts related to the texts. The process to start working is very simple as no registration is needed. Hence, visitors are able to quickly access the reading practice area and explore public texts and exercises offered.

Personal reading is carried out by offering a wide range of texts, which are classified accordingly to the following parameters: text topic, content difficulty and other users' average ranking of the suitability of texts. Indeed, to find interesting texts and exercises in the working area, texts can be automatically filtered by providing the parameters mentioned above. In addition, it is also possible to read and write reviews about texts and exercises. In conclusion, the reading practice area let visitors freedom to explore and to choose their learning content.

Once the text is selected the user must answer the question-answering exercises proposed (see figure 1). In this working area all existing exercises are shown at first, but learners have the opportunity to filter the exercises they want to proceed with. For instance, it is possible to determine the number of questions displayed. In addition, there are also some tools which might help the learners solve exercises, for example, several dictionary links are attached to the working area, and not only that, but also a question related tip can be displayed. Moreover, users are able to access a chat module to communicate with other learners.

Figure 1. Reading practice area.

Galdera: Question; Erantzuna: Answer; Erantzun egokia: Correct answer; Laguntza: Tip; Zuzendu: Check; Ikusi: See; Nora jaitsi zen aurreko asteazkenean?: Where did he go last Wednesday?; Nortzuk hasi ziren barrezka?: Who began to laugh?; Tresna lagungarriak: Helping tools.

3. DYNAMIC CONTENT FRAMEWORK

The main motivation to develop a dynamic content web application is to offer helping tools to students during their reading process of Basque texts. For this, the framework proposes question-answering exercises, and those exercises will inquiry into the knowledge of learners, in order to help them in their reading comprehension task.

As we have previously described, the presented framework has been designed to be an alternative to resources offering static courses such as [1] or [2]. In contrast, our aim is to promote user interaction by sharing content while reading practice. Among the advantages of resources offering this functionalities (for example [3]), we can mention that no previous lecture content-making is required as all the content is generated in the interaction between users and the web application. Apart from that, only a supervision work is required to check the correctness of texts and exercises. Additionally, the presented framework makes use of an automatic question generator, similar to [4], which helps on the content making task. The text and exercise sharing not only promotes content sharing, but also increases opportunities to successfully develop work study groups. In fact, some study team could easily register in the reading practice application and start working with exercises prepared by their tutor with no need of physically meeting each other. In conclusion, user interaction strategies in combination with automatic question generator systems make it possible to build a dynamic content framework. Section 3.1 describes how content is shared and section 3.2 shows the high level view of the automatic question generator.

3.1 Text and exercise sharing

Registered users play an important role in the developed framework. Actually, the web application does not offer any static course, so all the content must be dynamically prepared. In order to create content, registered users must access the file administration panel and provide as many texts and exercises as wanted. All the content provided will be accessible in the reading practice area. This way, apart from reading texts, registered users are able to act as virtual tutors of other users.

The file administration panel is a management area where a registered user operates with his/her own texts and exercises. It is visually divided into two different regions. The first region shows all the texts the current user has provided to the framework (see figure 2), and region two is used to upload new texts. As regards region one, it allows to supervise uploaded texts displaying an exercise editor. The exercise editor offers the opportunity to delete, add or modify proposed exercises. Each exercise is considered independent and it consists of a question sentence, a correct answer, a tip and a text input box to let the learner answer. Concerning region two, at the time of uploading new files, registered users are asked to fill in a form about text related information. After a text is submitted, it becomes accessible in region one.

ix Seneko

Fitxategiak kudeatzeko txokoa

Nire fitxategien zerrenda - Ezkutatu

Izena	Gaia	Zailtasun maila	Balorazioa	Partekatzea	Data	Onartua	Irakurri	Galderak zuzendu	Ezabatu	
Azerio eta saia.txt	Ipuina	L.H. (1.zikloa)	baloratu gabe	publikoa	aldatu	2012/12/12	bai	Irakurri	Galderak zuzendu	Ezabatu
Euskal Herriko mitologia.txt	Mitologia	L.H. (1.zikloa)	baloratu gabe	privatua	aldatu	2012/12/12	bai	Irakurri	Galderak zuzendu	Ezabatu
Inauteriak.txt	Kultura	L.H. (1.zikloa)	baloratu gabe	privatua	aldatu	2012/12/12	bai	Irakurri	Galderak zuzendu	Ezabatu
Itsas botika nimenoenak.txt	Medikuntza	L.H. (1.zikloa)	baloratu gabe	privatua	aldatu	2012/12/12	bai	Irakurri	Galderak zuzendu	Ezabatu
Lazkao Txikiaren biografia.txt	Pertsonaia	L.H. (1.zikloa)	baloratu gabe	privatua	aldatu	2012/12/12	bai	Irakurri	Galderak zuzendu	Ezabatu
Errege alferra.txt	Ipuina	L.H. (2.zikloa)	baloratu gabe	publikoa	aldatu	2012/12/12	bai	Irakurri	Galderak zuzendu	Ezabatu
Frantziako iraultza.txt	Historia	D.B.H. (2.zikloa)	baloratu gabe	privatua	aldatu	2012/12/26	bai	Irakurri	Galderak zuzendu	Ezabatu
Munduko bigarren gerra.txt	Historia	D.B.H. (2.zikloa)	baloratu gabe	privatua	aldatu	2012/12/26	bai	Irakurri	Galderak zuzendu	Ezabatu
Nire aitona Balentin.txt	Ipuina	L.H. (2.zikloa)	baloratu gabe	publikoa	aldatu	2013/01/07	bai	Irakurri	Galderak zuzendu	Ezabatu

Figure 2. File administration panel.

Nire fitxategien zerrenda: My text list; *Ezkutatu*: Hide; *Izena*: Name; *Gaia*: Theme; *Zailtasun maila*: Content difficulty; *Balorazioa*: Rate; *Partekatzea*: Sharing; *Data*: Date; *Onartua*: Accepted; *Iritziak ikusi*: See reviews; *Pribatua*: Private; *Aldatu*: Change; *Bai*: Yes; *Irakurri*: Read; *Galderak zuzendu*: Modify questions; *Ezabatu*: Delete.

To correctly carry out content sharing, registered users are able to establish public or private access to their texts and exercises (see figure 3). Notice that private labelled texts and exercises will only be accessible for the user who uploaded the text. For instance, from a peer-learning methodology perspective, the usage of private content lets the tutor supervise content before publishing the final version of the exercises.

Fitxategi bat aplikaziora igo

Izena:

Gaia:

Zailtasun maila:

Partekatze modua:

Fitxategia aukeratu (txt formatua, gehienez 25 kilo byte)

Era etikoan jotatuko dut

Elogir un archivo No se ha... archivo

Igo

Figure 3. Text upload form.

Fitxategi bat aplikaziora igo: Upload a new text; *Izena*: Name; *Gaia*: Theme; *Zailtasun maila*: Content difficulty; *Partekatze modua*: Sharing; *Fitxategia aukeratu*: Select a local text; *Era etikoan jotatuko dut*: I agree to the honor code; *Igo*: Upload.

3.2 Automatic exercise generation

The question generator automatically creates questions about uploaded texts, and simultaneously, the web application starts a communication pipeline so that it is served with all the generated questions. Exercises are also automatically build out of these questions. Due to the fact that the automatic question generation task and the following importation are unsupervised processes, exercises offered in the framework must be checked through the file administration panel. That is why the reading practice application can be seen as a semi-automatic framework where users can supervise the automatically generated exercises.

Most of the current AQG systems are based on English [4][5][6] where the amount of natural language processing (NLP) resources is huge compared to Basque. Nevertheless, [7] have already proven the viability of the question generation task for Basque. The question generation task is described as a three-step process: the target selection, the question type selection and the question construction. These phases require linguistic information retrieved by means of several NLP tools: syntactic analysers, morphosyntactic analysers, named entity recognisers and semantic role labellers among others. The work presented in this article is a new attempt to automatically generate sentence level questions and integrate the system into a reading practice educational domain.

Our AQG system [8] first performs a morphosyntactic analysis of the input text [9], which is represented with the Kyoto Annotation Framework format [10]. After that, it parses those morphosyntactic features in order to obtain morphosyntactic and semantic information, and this lets the target selection step continue. Based on different selection criteria, both targets and question types are identified with the purpose of constructing sentence level questions. The idea behind the target identification is a weighting heuristic which selects noun phrases from each sentence. In brief, the weight of each noun phrase is established accordingly to the information extracted. At the moment, the heuristic makes use of a semantic dictionary that semantically defines each entry appearing in it [11], a named entity recogniser system [12], a role semantic verb collection [13] which predicts the role of some targets and a morphosyntactic analyser [9].

4. EXPERIMENT

As regards the evaluation of the reading practice framework, we focused on analysing the usefulness of the web application in an educational environment by performing an experiment on a primary school [14] classroom where thirteen students (between nine and ten years old) and two teachers were involved. As peer-learning is used for different activities in this school, the scenario was adequate to test some capabilities of the application.

The proposed activity consisted of different exercises, lasted an hour and a half and it was conducted on a peer reading scenario. At first, students were divided in groups of two, in order to form different peers, and were asked to try and navigate through the website to be familiarized with the application. After basic usage was explained and students were confident with, they were asked to read a short story and answer to five questions related to the text. To conclude with, peers were asked to create some new questions on their own and shared those questions with other peers. During the activity, teachers supervised the work done by all peers, offered help when necessary and tried out the application. Once the experiment finished, participants were asked to answer a questionnaire to help us collect their impressions about the web application.

Teachers were grateful for having tried an e-learning application and observed the kind of advantages this type of applications could provide for different learning methodologies and scenarios. Students were pleased for having done reading activities in a computer laboratory and for having shared their content with their classmates.

5. CONCLUSIONS AND FUTURE WORK

Not only collected survey responses, but also observed students' motivation and active participation confirmed us that the proposed task was adequate for peer-reading practice. Actually, the experiment shows how e-learning applications can effectively be used in school scenarios, and provide technology to innovate school activities promoting interaction between learners. Apart from this, the exercise sharing approach, and the inclusion of an exercise generator system give to the reading practice framework the base to create content dynamically, allowing users to create and share questions about texts. The framework offers several tools, such as: a file administration panel, to manually supervise content; a chat module, to communicate with other users and a text review module, to be aware of other users' comments. Apart from these, text and exercise rates give new users a

quick overall view of content quality. The usage of all these tools give learners freedom to explore the content offered in the framework.

Future work will focus on the improvement of the framework to adapt the current prototype into a stable version. Among others, it is important to continue improving the usefulness of the web application in order to facilitate its usage, specially for non-accustomed computer users. In addition, it is also necessary to continue improving the reading practice framework to let it follow school methodologies more closely. That is why we plan to improve the framework in order to adequate its functionality to the special needs of teachers and students.

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