PowerInf – Collaborative Learning Environment

Luciana Oliveira e Silva
Instituto de Informática
Universidade Federal de Goiás (UFG)
Caixa Postal 131 – CEP 74001-970
Goiânia – GO – Brazil
55 62 35211181
luciana.go@gmail.com

Ana Paula L. Ambrósio
Instituto de Informática
Universidade Federal de Goiás (UFG)
Caixa Postal 131 – CEP 74001-970
Goiânia – GO – Brazil
55 62 35211181
apaula@inf.ufg.br

ABSTRACT

Innovation in the methodology of teaching is one of the proposals of collaborative learning. It provides an approach that enhances the learning of students by encouraging the participation and effective exchange of information between students and teacher. This paper presents the tool PowerInf, an environment of the classroom, electronic, which facilitates the interaction between participants. The tool also provides support to students in their research activities, allowing the student has easy access to a range of supplementary teaching materials in the same context of the slides presented in the classroom.

Categories and Subject Descriptors

General Terms
Management, Design, Human Factors.

Keywords
Collaborative Learning, Automatic Document Contextualization, Electronic Classroom.

1. INTRODUCTION

The ever-increasing technological advances and ease of access to new technologies have caused significant changes in society that are now reflected in education. This scenario requires teachers to review their traditional methods of teaching, where they act as knowledge transmitters, leaving students as simple receivers. They now need to create environments that are stimulating to knowledge transmitters, leaving student

context. Here, the teacher no longer plays the role of sole knowledge keeper and becomes a mentor, guiding the students so they can progressively develop and assimilate the content being displayed. [Nitzke et al. 1999] emphasizes that learning involves collaborative methodologies that seek to promote learning through collaborative efforts among students working in a particular task.

[Panitz 1996] defines collaborative learning as "any situation where people gather in groups and the skills and contributions of individual components of the group are highlighted and considered." Collaborative activities involve actions where participants need to explain their reasoning to the other partners. This brings positive results, both for those receiving the explanation, since he has contact with new knowledge or a new vision of what he thought, as well as to the person who explains, because verbalization requires development of reasoning to be understood by others [Dillenbourg e Schneider 1995].

As the primary purpose of collaborative learning is to encourage students in the habit of research and, consequently, strengthen the capacity of self-learning, the tools to support this approach should, preferably, provide ways of supporting the student, providing resources to help in this process.

The use of teaching materials (books, handouts, scientific articles, e-books, Web pages, among others) adequate and easily accessible is crucial to guide and motivate the student, and broaden their knowledge on the subject, rising it to a critical level of content understanding, instigating the student to research, while monitoring and evaluating the learning process [Neder and Possari 2001].

Any activity in the classroom can be supported by teaching materials and in the collaborative environment, is part of the lesson. The material is extremely important when it comes to this methodology, because this kind of education each student is understood as a person capable of learning alone has provided enough material understandable and attractive. Thus, this material will be able to collaborate to expand the knowledge of students on the subjects worked stimulating, especially its capacity for critical understanding of content.

To achieve the goals in that environment, the teacher needs to provide the student with sources that will help him expand his understanding of the subject and help him to complete the exercises and surveys being proposed. For this, the student has to
identify sources in the matter being discussed, and which items are needed to solve the proposed problem. If the Internet is used as a source of research, the student will generally have to perform several iterations to achieve optimum results.

Despite the great development of search engines available today, they still have limitations both for users, not to indicate an appropriate consultation, as by the tool itself, which does not have the ability to recognize exactly the context where the user is inserted, to achieve a better search.

On the other hand, teachers are still strongly attached to the use of slides as a presentation tool. The incorporation of new technologies into slide presentation tools includes the use of ink for annotation and capabilities that allow student-teacher communication [Anderson & al. 2007].

The use of slides in the classroom allows teachers to organize and summarize the topics to be addressed, display graphics, images, videos, and other visuals to break the monotony of class. They can also be used as a tool to stimulate the debate and for presentations of the students.

Teachers prepare their presentations in order to organize and summarize the content to be displayed. The slides serve only as a guide for the conduct of the lesson. Usually a presentation brings the central theme of the lesson, the objectives of learning and content to be discussed - a topic usually addressed by slide, highlighting the most important points of the theme.

This work aims to further extend a slide presentation tool with contextualized document search capabilities, providing an electronic environment for classroom collaboration, besides being a tool to support the student in the process of self-learning, especially at times when additional literature is required. At this point the tool aims to significantly reduce the time spent in the research process by carrying out a search with automatic contextualization, and maximize the recovery of relevant documents.

The interpretation of the slide exposed by the teacher is very important to allow an effective consultation. The goal is to direct the student to search a set of documents that address the issue exposed throughout the presentation, or the content of the lesson to ensure proper contextualization of the research.

2. SCENARIO
The tool aims to be a software developed to support the teacher in the presentation of content, in the conduct of discussions and conducting the activities of students, always through the pedagogical methodology of collaborative learning. But the main goal is a tool that supports the student in the process of self-learning, so that it provides a direct link between the content of the presentation to a collection of teaching material.

Thus, the student will be able to drive their learning, analyzing and evaluating the documents found, refine your search, and thus expanding your knowledge on the subject addressed.

It is important to note that, by itself, the tool does not reach the goals of teaching methodology. To make it reach its goals it needs to develop activities and the teacher leads the activities of the students so that they are able to achieve your goal.

3. QUERY EXPANSION
As the purpose of the tool is to provide educational materials for students in a finite universe (academic repository) and infinite (internet), we use techniques to ensure the recovery of documents that are associated with the content being studied.

The identification of the context of a document is performed by humans in a natural way. A simple reading of a title or a summary, for example, can elucidate the reader on the content of material that is at hand.

When dealing with a computerized system, leaving that task to be trivial. That's because the computer still does not have the same capacity for human interpretation. Therefore, applying a technique that identifies the context of a document has been a challenge for many researchers over many years.

The expansion of the consultation is a technique widely used in the recovery of information with the aim to contextualize the original user's query. Basically the technique is the addition of terms related to the terms originally included in the consultation.

4. POWERINF
The paper proposes a PowerInf - an Add-In for Microsoft PowerPoint 2003/2007 - as tool that serves as a collaborative learning environment with the objective of allowing greater interaction in the classroom and, above all, serve as support to the student in the study and implementation of their activities.

His intention is to be an alternative to traditional classrooms where teachers use in the form of slide presentations to explain content. The proposal is its use in classrooms, equipped with computers on a network, to attract the attention of the student and encourage him in the search for knowledge.

In a first scenario, the teacher sets out the objectives of the class with the aid of a presentation - presentation master. At this time the teacher can make use of digital ink annotations to perform in the presentation and thus better guide the students.

Figure 1 – Example of how the teacher can highlight items in a slide
During the presentation, students can monitor on their computers, so synchronous, all content that is submitted and noted the presentation master. Students can hold notes in their
presentations, write down your questions and guide them to the teacher, in real time.

In a second scenario, students should be directed to study individual or group or even carry out activities for setting up and content. For this, have access to quality learning materials can ensure better learning. At that time, the proposed tool provides the student the opportunity to consult the Internet or in a repository academic.

In Tool these terms are automatically added to the user's query. These terms, known as relevant, are identified after the use of technical of information recovery of removal of stopwords and stemming, for example.

It is known that a simple consultation, where the student accesses a site search and enter one or more terms, is likely to return documents not relevant.

The spread of the tool is that it automatically analyzes the content of slides and identifies, through specific methodology on relevant words, the context of the subject being exposed. Thus, when a student uses the tool to look at the Internet, the tool adds the context identified by the student informed the end, maximizing the chances of an efficient recovery of documents.

The tool also includes an academic single repository, where all relevant material as assessed by one or more teachers of the institution is stored, regardless of subject. This means that over its use, a broad multidisciplinary base of knowledge (articles, presentations, monographs, books, among others) will be formed and will be available to students.

To improve the effectiveness of the consultation, the slides have assessed its content in accordance with its structure and its relevant terms are weighted according to their importance in that structure. For example, in relevant evidence has greater weight than the relevant paragraphs in common, relevant terms written by digital ink also have characteristics that make them more important.

After identifying the relevant, the tool creates a list with the ranking of the most important words in the presentation. This order of relevance is applied to the consultation, together with the original reports by the end user.

The results show recovery rate of relevant, documents within the context of the slide, up to 100%.

5. CONCLUSION

The paper presents a PowerInf, a tool that can be used in teaching any subject, especially for institutions or teachers who apply the methodology of collaborative learning. Here the teacher can present your slides and use digital ink to add annotations, highlight concepts, among other activities.

The tool also allows the students held their own notes for later study, send questions or resolutions of exercises for the teacher.

But the big difference is the tool that the support it provides to students in their individual research activities, through the automatic recognition of context of the slides, directing the query to a student's selection of material with highly relevant content and, above all, consistent with what is being presented by the teacher.

6. REFERENCES


