

There are three sensors mounted on the material covering the foam surround of the left ear cup that pick up electrical signals from the skin, there is another sensor attached to something that looks like a microphone boom, but which in practice rests on the forehead just above the left eye.

Connection is through a Bluetooth link and software to gather data from the headset treats the link as serial data through a Com port.

Methodology

The aim of this research is to investigate the capabilities, ease of programming and use of the headset as a prior to identifying directions for further study possibly supported by potential final year student projects. This was achieved by writing code to interface, download and inspect the data.

On starting it is important to follow the instructions for installation making sure that you first install the dll, then the supplied driver and finally connect the supplied Bluetooth dongle, otherwise your system may download and use incompatible products. There is the added uncertainty that if you are writing code you do not know where some of the communication errors may be originating from.

This headset has an onboard computer that preprocesses the signals before transmission over the Bluetooth serial connection. Demonstration programs show representations of the brainwaves you are producing and enable control of some "game like" activities. This performs the important role of confirming that the system can and does work.

Software is available to connect the headset through Matlab, however at present the real test comes in writing your own code to interface with the device so that you can develop further applications. There is a fair amount of documentation to help but it didn't prepare me for what was to follow.

Code development was unsuccessfully started on a new "networked" installation of Windows 7 and Microsoft Developers Studio 2010 using C#. Trouble soon appeared in the form of compile time and runtime errors. A simpler stand alone Windows XP platform with MSDS 2008 environment

was then used as a testbed. Sometimes MSDS 2010 produces more and different error messages to 2008 for the same code but effectively less errors were found using 2008 which doesn't mean they weren't there. When success was achieved working code was ported Windows 7 (2010) and refined/reworked where needed.

Findings

The major problem encountered so far has been communicating to the headset through the dll. The dll was written in C with calling structures which C# works with as "unmanaged" code. Changes in the development environment to work with required calling conventions was accompanied by a needed change in the "passed" data types to Ansi rather than the Unicode default. It was then possible to address the COM port properly at compile time and work effectively through the dll at run time.

The system can now communicate and download large blocks of data for inspection. The next step is to analyse and display the data received. A standard set of tasks will be developed and an associated data gathering exercises with different participants will look for similarities and differences in what has been achieved and what the data looks like.

Summary

This research suffered from unforeseen issues related to the marriage of operating systems, development environments and programming languages. Now that the initial hurdles have been passed it is expected that good progress can be made in analysing and interpreting the data retrieved with a view to further research.

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Tasys Management System Project

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Abstract

The purpose of this project was to develop a Windows application capable of working with multiple web-based applications provided by Tasys for motor vehicle dealers.

The application required the development of several sub systems which included; user management, customer management, inventory management, sales management vehicle finance tracking, and customer finance tracking while incorporating mechanisms for transferring data securely and advanced error handling.

An agile methodology was use to develop the system.

The application was developed using a multilayer architecture where local database queries pass through three separate layers: Controller, Business Logic, and Data Access. This method provided a scalable and reusable development environment.

The application has assisted in the administration, trading, and financial transactions related to motor vehicle sales. The system can communicate with web-based systems to provide up to date information on all vehicles.

Keywords

Agile methodology, user management, vehicle reporting, inventory management, finance tracking, secure data transfer.

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Introduction

Tasys is an IT development and support entity notably developing PHP-based backend reporting systems for the business Autofinder.

The project aimed to deliver a system capable of working with multiple web-based applications and provide management systems to assist clients in administration, trading, and finance. The application had to be MS Windows based, capable of running on XP or higher.

Methodology

To manage this project, the Agile System Development Life Cycle (Ambler, 2010) was used as a guide. The project involved the creation of several mini prototypes in iterative and incremental stages with high involvement from the project sponsor.

Key analysis documentation included Use Case, Entity Relationship and Sequence Diagrams.

Input/output designs were provided by the project sponsor.

The application was developed using a multilayer architecture. Local database queries pass through three separate layers: Controller, Business Logic, and Data Access. This method provided a scalable and reusable development environment.

Prototypes of major tasks were created and test tested for 100% functionality before adding to the final release.

Results

A windows form frontend solution was developed using C# .NET 3.5 with a Microsoft SQL Server 2005 backend. A Multiple Document Interface (MDI) was implemented to allow users to work with several management systems at the same time. The system

connects to multiple remote data sources via web-based applications to query vehicle data and reports.

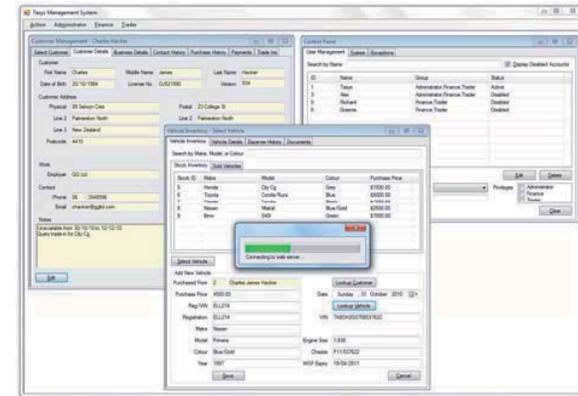


Figure 1: Three management systems running simultaneously

Conclusion

A Motor Vehicle Dealership Management System has been developed that assists in the administration, trading, and financial transactions related to motor vehicle sales.

The system can communicate with web-based systems to provide up to date information on all vehicles.

Key features of the system include:

- Secure data transfers.
- Inventory management.
- Vehicle and customer finance tracking.

Advance error handling, reporting and control.

References

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The Proteomics Image Annotator (PIAnno) Web Application

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Abstract

The Nutrigenomics group is made of Proteomics researchers, around 60 in number, who are distributed throughout New Zealand. The scientists conduct their research using '2d gel electrophoresis' images. The resulting image contains spots of interest. Information about these spots (like the corresponding gene etc.) are then annotated onto the image. The process of annotating and sharing the image is far too complicated as researchers resort to using tools such as PowerPoint to annotate and then share these annotated images via email. The Proteomics Image Annotator (PIAnno) web application gives the Proteomics researchers the ability to import and annotate 2d gel electrophoresis images, save them to a database, and then export them in an image format. This allows sharing of information between these scientists utilising an easy to use web interface.

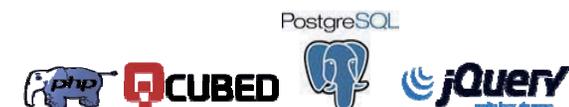
Keywords

Nutrigenomics, Crohn's disease, QCubed Framework, HTML 5 Canvas

Introduction

Scientists within the Nutrigenomics group are currently undertaking an investigation of food gene interactions. They are looking into Crohn's disease and trying to find nutritional ways to combat it.

Scientists from around the country are partaking in this research project and thus a lot of the data collected, specifically the 2d gel electrophoresis images, is required to be shared between them. Plant and Food have created a



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basic image annotator prototype that allows the 2d gel images to be stored centrally. It uses a geographic information system that provides an easy to use annotation tool. The existing system does not allow for exporting of these annotated images to image formats, currently an entire screen capture is the only way to record the annotated image. The objectives of the Proteomics Image Annotator (PIAnno) web application project were to improve the existing system so the scientists have the ability to export the annotated 2d gel images in an image format. All of this was to be done via an easy to use web interface to provide a simple sharing solution for the scientists involved.

Methodology Analysis

Analysis of the old system was completed by reviewing the different areas such as the database, QCubed framework and OpenLayers software.

Research

Research was undertaken to investigate how different image layers could be exported. Particular methods that were investigated were: HTML 5 Canvas layers and VML code for non-compliant browsers.

Development

A custom image layer was created to handle the exporting of the gel image into a canvas layer or VML state. Code was written to get the canvas and VML code converted into the chosen file types before displaying a link to the end user for download.

Conclusion

The scientists now have the ability to annotate and export 2d gel electrophoresis images to a desktop computer via a web

interface. This gives the researchers the enhanced capability to share data with each other, without resorting back to PowerPoint and email as the previous system necessitated.

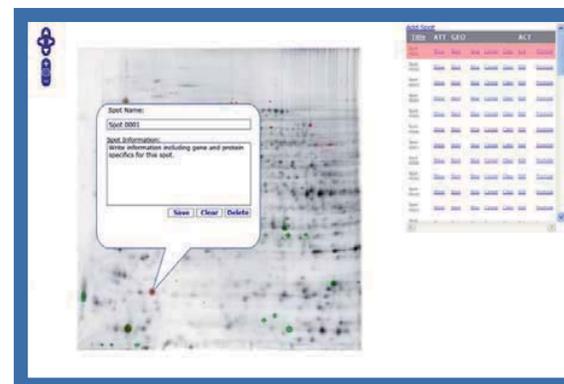


Figure 1: Annotating spots of interest

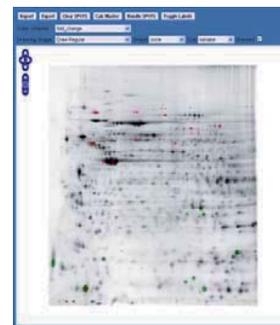


Figure 2: Set image properties

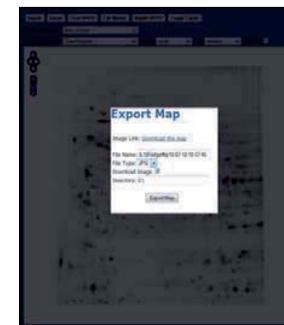


Figure 3: Export Success!

Systems Analysis and Design: Student Group Projects in a Blended Environment

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Helping Groups Succeed in a Blended SAD Course



This poster paper appeared at the 2nd annual conference of Computing and Information Technology Research and Education New Zealand (CITREnz2011) incorporating the 24th Annual Conference of the National Advisory Committee on Computing Qualifications, Rotorua, New Zealand, July 6-8. Samuel Mann and Michael Verhaart (Eds).

Abstract

This paper discusses some of the aspects of preparing the Systems Analysis and Design course for blended delivery, with particular emphasis on student group assignments in a blended environment. The first step is to understand how blended is different from pure classroom delivery, especially pertaining to student project groups. A brief literature review reveals interesting alternative approaches and good practices that may be used in the future. These approaches and practices together with additional online learning material may help groups succeed at the same level as in a pure classroom delivery. At the end, the ideas are summarized to form a recommendation for further work on this course.

Keywords

Systems analysis and design, blended delivery, group work

Introduction

Students in a blended SAD course will have fewer lecture meetings. Therefore, in comparison with pure face-to-face students, they will have fewer regular occasions for group relationship building and communication. As a result, they may have fewer face-to-face interactions: with members in their own group, with all other students that may benefit their own group, and with the lecturer.

They will also acquire the SAD knowledge differently. How well they understand SAD phases, principles, and models will also impact how well they will perform in their group project. Instead of learning and discussing SAD concepts and guidelines primarily in the face-to-face classroom, they will be expected to conduct more independent learning as well as using online learning materials.

Literature Review

Project-based collaborative learning induces students to translate cognitive knowledge into practical and creative results (Tilchin, 2010). This involves breaking down the project into specific tasks, deliverables, and stages. Each student in a group needs to be assigned to a specific task(s) independently. Online learning tools assist the lecturer in monitoring how students distribute the tasks, and progress through interim deliverables and stages.

There is a need to track interactions and progress in each group beyond just the meeting minutes. This can help the lecturer intervene if necessary, especially in a blended environment where the lecturer has less face-to-face contact with the students (Steenkamp, 2002). The lecturer can do this both by using the online learning tools to capture such information, and by appointing (or requiring the election of) a leader in each group and communicating with him/her.

A Possible Framework for Guidance

The course designer and the lecturer (teacher) need to consider certain questions, and answer them. For this paper, the questions are about student project groups and the role of the teacher and the technology in facilitating them. Thus a new matrix (below) may be created that matches the educational actors according to Caceffo & Rocha (2011) with the stages of group development according to White (2009).

	Teacher	Technology	Students
Forming			
Storming			
Norming			
Performing			
Reforming			

Table 1: A Matrix of Stages of Group Development and the Main Actors of Blended Delivery

The objective is to ask and answer the appropriate question for each cell, for example, what role can the teacher play during the forming phase... what role can course technology (e.g. software) play during the storming phase?... etc.

Conclusion and Recommendations

Blended delivery requires that lecturers are available via email or chat for consultation more than in pure face-to-face classes (Felder, 2001). Some of the information about the internal interactions in each group needs to be available online as examples to all other groups in order to offset the possibility that inter-group interaction and assistance will be less during blended delivery. For a blended SAD course, one half of the theoretical contents can be delivered via face-to-face lectures, which will leave only some lectures and mostly tutorials to be done online or independently by the students.

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Engaging International Students through e-Learning: Pedagogical Aspect

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Abstract

This paper investigates attitude of students to MOODLE. The aim is to find out if MOODLE assists students to understand the course contents better. The extent to which cultural, technical and linguistic factors may affect pedagogical advancements where eLearning is concerned for students for whom English is a second language is described. Factors include communication and collaboration amongst peers, interactivity, and understanding level of the content on MOODLE.

Keywords

E-Learning, MOODLE, pedagogical factors, International students

Introduction

Around 268 schools, polytechnics and universities in New Zealand are using MOODLE, an online learning mode which helps educators to facilitate course materials like lectures, combined with other collaborative tools such as forums, discussion boards, chat, videos and other multimedia clips. This paper explores on the idea on how MOODLE can facilitate and yet constrain the teaching and learning process based on individual preferences. By discussing the challenges involved with making MOODLE an effective eLearning

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strategy, this paper will present factors which minimises students being innovative while learning through MOODLE.

Methodology

A mixed approach is used for this research.

Secondary sources

- Quantitative: statistics and other related databases.
- Qualitative: Field notes, observation records and other personal, research-related documents.

RESULTS

Factors	Findings
Interactivity	Facilitated group decision practices, discussion threads are used minimally amongst students. MOODLE mainly used for assignments and research report
Communication	MOODLE is not fully responsive to student needs in terms of communication. Students liked face-to-face communication better to allow for critical thinking
Group work	This does not rate highly. The 'shyness' factor overrides collaboration
Personalisation	Cannot be customised to suit individual student needs. Structures not utilised efficiently

Table 1: Pedagogical Factors

Findings

MOODLE does not allow for critical thinking which occurs in face to face situations where students are allowed to think aloud and voice their opinions. Educational organisations are quite forceful in terms of MOODLE usage, not many Seminars or Help facilities are provided to improve skills or learning new things.

The user manuals of MOODLE are quite technically detailed, making it too cumbersome for students to explore any features such as language settings or creating threads. Furthermore, possessing advanced technical skills do not fully promote effective learning as there is language difficulty to understand what is required.

There is a need to find critical factors which motivate students to serve their personal need as per the educational satisfaction level.

Restrictions of MOODLE could be viewed as a limitation in terms of its capacity in supporting daily management of learning activities and providing an effective collaborative learning environment. The expected learning outcome may be hard for students to measure in terms of what is put up on MOODLE and what actually happens in the class.

Conclusion

While online learning is an organised, synchronized and orchestrated way to promote the learning aims of the students, it can only be assumed that optimal learning stemmed from individual student preferences rather than a personal drive to be resourceful while using MOODLE as an eLearning tool.

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Programming 1 – Local Pass Rate Improvements

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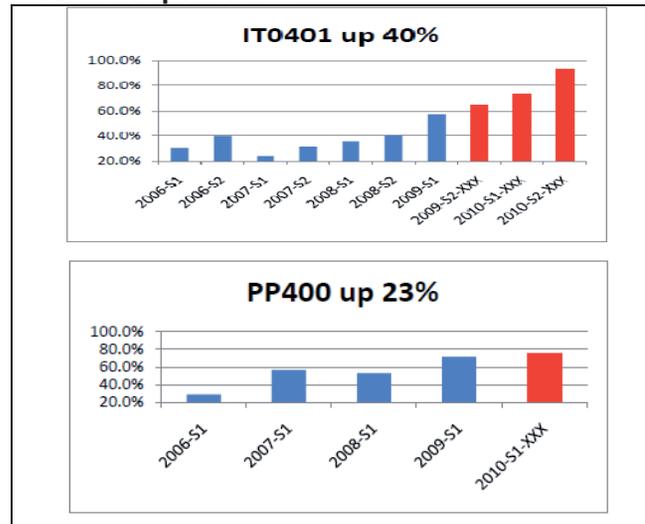
Abstract

We previously reviewed IT pass rates (Potgieter et al, 2009 & 2010). Recently we observed pass rates for programming taught by new tutor, was higher than the past with existing tutors. This poster reviews the data and is followed by two other "Programming..." posters researching the matter.

Keywords

Novice programmers, programming curricula, patterns, schema, comprehension, problem solving.

Pass rates per course



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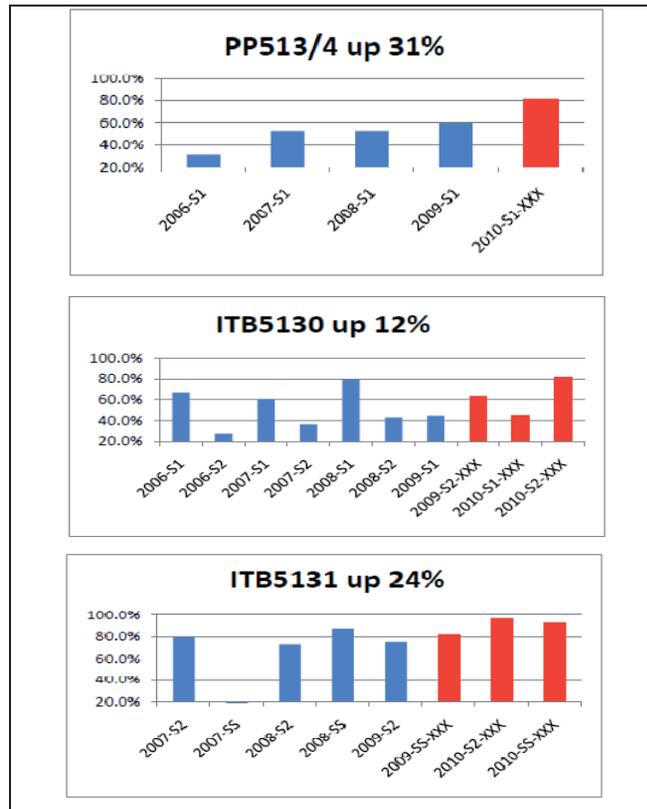


Figure 1: Pass rates per course

Possible reasons, each investigated:

- Standards? No (Pre- and Post moderation is clear)
- Class demographics changes? No

- PC equipment changes and stability? No
- Industrial relations (Staff strikes 2009)? No
- Language change 2006 & 2007? Slight increases
- Enrolments changes? Up, but what's the influence?

Tutor approach & techniques

- Researched teaching of programming for success
- Phases: Direction, Coach, Mentoring, Delegation
- Iterative development (full programming experience)
- Use power of console-based languages
- Use logic puzzles at start of class to help focus
- First test closed book and MERIT if they pass
- Resists after close book test, are open book
- Share own programming experiences
- Use Moodle with quizzes – like a game for them
- All slides have Moodle screen appearances
- Repetition - several exercises, several times
- Use experience from one course for the next

Summary

Reflective practice teaching with approach that does repetitively stimulation of "student thinking patterns with programming problem solving". Next step: explore "thinking patterns re problem solving" further in this poster series.

Acknowledgement:

Fernanda Potgieter shared theories and ideas regarding "Thinking, Problem Solving, Logic" and other aspects from cognitive psychology.

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