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Spring 2006

### Development of a Learning Management System for Ucar-Comet

Dan Riter

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**REGIS UNIVERSITY**  
**SCHOOL FOR PROFESSIONAL STUDIES**

MASTER OF SCIENCE  
IN  
COMPUTER INFORMATION TECHNOLOGY

**Development of a  
Learning Management System for  
UCAR-COMET**

**PROFESSIONAL PROJECT**

Dan Riter

March 6, 2006

## **Abstract**

UCAR-COMET creates web-based training modules for professional meteorologists. Prior to the implementation of this project, UCAR-COMET did not have a Learning Management System. A Learning Management System is a web-based system that allows meteorologists to keep track of personal information that relates to each learning module. The Learning Management System also allows the meteorologists' supervisors to monitor this information. Although there are many Learning Management Systems on the market, most are expensive, cannot be customized, and require contract agreements. UCAR-COMET would like to own a web-based system where users can create and manage their own accounts. A user account primarily keeps track of progress on each module and quiz scores. In the future, UCAR-COMET would like to add a feature that will allow the user to take notes and bookmark pages while completing a module. UCAR-COMET is a non-profit organization making cost a major factor.

A low-cost solution was achieved through the use of a MySQL database and php GUI access pages. The system is hosted on an Apache Web Server. Qualified staff built and implemented the solution. The web server is located in-house and users can gain access to modules and the Learning Management System via browser and Internet connection. The GUI is straightforward and easy to use. Support for the system is provided via email.

The Learning Management System is quickly becoming part of any web-based training program. The training budget is often the first item to get cut when money is tight. UCAR-COMET must be proactive in providing meteorologists' supervisors with information on the effectiveness of web-based training. The effectiveness of training can

be quantified via the information tracked by the Learning Management System. Through the implementation of a low-cost Learning Management System, COMET-UCAR meets its clients' information tracking requirements.

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## **1.0 Chapter One: Introduction**

### **1.1 Problem Statement**

UCAR-COMET creates web-based training modules for professional meteorologists. Prior to the implementation of this project, UCAR-COMET did not have a Learning Management System. A Learning Management System is a web-based system that allows meteorologists to keep track of personal information that relates to each learning module. This System allows the meteorologists' supervisors to monitor this information. Although there are many Learning Management Systems on the market, most are expensive, cannot be customized, and require contract agreements. UCAR-COMET would like to own a web-based system where users can create and manage their own accounts. A user account primarily keeps track of progress on each module and quiz scores. In the future, UCAR-COMET would like to add a feature that will allow the user to take notes and bookmark pages while completing a module.

### **1.2 Review of Existing Situation**

“In 1989 the University Corporation for Atmospheric Research (UCAR) and the National Weather Service (NWS) established the Cooperative Program for Operational Meteorology, Education and Training (COMET) to promote a better understanding of mesoscale meteorology and to maximize the benefits of new weather technologies. Today the COMET Program addresses education and training needs in the atmospheric and related sciences through online learning modules” (COMET).

An executive board and an advisory panel govern the COMET Program. The executive board is made up of the heads of the training organizations that sponsor the



program. The advisory panel is composed of representatives of the academic and operational forecasting communities that COMET serves. Examples of training modules can be found on the Meted website, UCAR-COMET's learning module portal at <http://meted.comet.ucar.edu>.

Prior to the implementation of this project, UCAR-COMET did not have a Learning Management System. When a user took a module, there was no information stored about their time or of the amount of the module that was completed. Users take modules for either personal education or job requirements. Many of UCAR-COMET's sponsors require that their employees take and pass certain learning modules. Module quizzes are emailed to management at UCAR-COMET, but no database is actively compiling these user quiz scores. Databases analyzing quiz scores are needed because the supervisors of many users would like to be able to check on their employees' scores. In addition, these scores can be used to analyze which areas might be harder for some of their employees to grasp.

Prior to the implementation of the Learning Management System, emails sat on individual managers' computers and nothing was ever done with them. A system was needed to compile information and scores so the managers could know that training information was in fact being learned, acquired and retained. There needed to be accountability from the user towards their completion of the modules. There was no way to run reports on these quiz scores to gain useful information. Information compiled could be used to analyze the effectiveness of training modules, how much time a user spends reading through the information, and learning vs. use of information data.

Sponsors are supporting members of the non-profit entity called UCAR-COMET. Each sponsor agrees to a fixed amount of annual funding. The amount of funding each sponsor provides determines the amount of voting power on the board. This board determines what learning modules and what special projects (such as the creation of a Learning Management System) are created in a given fiscal year. The panel decides which training modules to build based on many different trends such as new technology, popular issues, and catastrophic weather events.

### **1.3 Project Goals**

The goals for this project were to investigate the possible Learning Management System options including purchasing an off-the-shelf system, adopting a free, open source system, or creating and owning a custom Learning Management System. The Learning Management System was needed to track progress and success on a module. The system should be easy to use for both users and administrators. Both users and administrators have varying ranges of technology aptitude. The Learning Management System needs to take into account these varying comfort levels with technology and make the analysis of data accessible to all parties. The system should be modular to allow future additions. COMET is consistently adding new technology and techniques to their modules. The Learning Management System needs to be able to be easily manipulated to include analysis of new additions and sections. All work was done in house with the current staff. Staff includes web designers, graphic artists, programmers, meteorologists, project managers, and administrators. Additional resources including staff and technology are not necessary. The project was deemed successful when the system was

operational meaning, it can collect, analyze, categorize, and send data. A six-month completion time line was established.

#### **1.4 Barriers and Issues**

An issue from the users' perspective is that they are now required to provide UCAR-COMET with personal information and are subject to quiz score tracking. Personal information includes name, address, affiliation (where they work), email, and so on. Users' scores can be analyzed, their time spent on a module is revealed, their completion of the module and the time it takes them to complete it are tracked. There is somewhat of an ethical issue at play when users are required to reveal their personal information and scores. One hurdle is getting the user to be comfortable with this process. Tracking an employee's progress on training modules and tracking their test scores may be perceived as unethical if used as the basis of job performance reviews and advancement. If managers or administrators require all users to submit their information and it is just something that is required, this may alleviate the stress of the user. Reassurance by employers that quiz scores will not be used as job performance appraisal is advised as well.

#### **1.5 Project Scope**

The project was estimated to take six months to complete from analysis and design through implementation. Analysis and design occupied 1 month, development took 4 months and implementation and testing took 1 month, totaling 6 months. The exact dollar amount was the sum total of one full time programmer at 80K/yr, two 1/2-

time developers at 60K/yr, and three managers ¼-time at 80K/yr totaling 100K. This labor total represents the entire cost to UCAR-COMET, as all the software was free ware. The time lost to production was represented by a decrease in module production for the six-month period. COMET has a small labor force, but the other employees are able to efficiently continue module production.

### **1.6 Summary**

UCAR-COMET was being asked by its sponsors to provide a Learning Management System so that module behavior could be tracked. The tracking included time spent in a module, completeness of a module, and quiz score information. All information is stored in a mySQL database. Individual module information is tracked for each user. Reports about all information stored are available for management via the web-based system interface. Reports are available by search type or custom searches can be created. The user and admin Guided User Interface (GUI) are a series of php pages (see appendix A and B for examples).

## **2.0 Chapter Two: Research**

### **2.1 Review of Available Solutions**

Three main solutions to tracking data were to build the Learning Management System in-house, use a free open source system, or purchase an off-the-shelf product. There are many off-the-shelf Learning Management Systems available. These off-the-shelf products range in price from free to hundreds of thousands of dollars. “Interact is an open source Learning Community Environment. It could also be called a Learning Management System, a Course Management System, or a Virtual Learning Environment” (Interact 1). Interact provides the source code for their Learning Management System as a free download. Although this is a cost attractive solution, the time involved in deciphering the source code is intensive. On the flip side of the open source offered by Interact are more expensive off the shelf Learning Management Systems. Negative aspects of these Learning Managements Systems are their initial cost and the cost to maintain effectiveness. One example of such a Learning Management System is geo-learning. According to Liz Page, “The National Weather Service recently learned the hard way that Learning Management Systems can cost a fortune. The National Weather Service pays \$100K/year upkeep on the system, which includes access to SkilSoft and NetG courses. Initial cost was \$250K (in 2001), and they have paid a bit more in customizations (on the order of \$100K) and it's hard to estimate pain and suffering costs” (personal communication December 10, 2005).

What is the big difference between an open source system like the Interact system and a million dollar system such as geo-learning? The big difference is that there are no sales people knocking down doors to promote a free piece of software. Advertising

and marketing are expensive and are absorbed in the cost of high-priced, off the shelf software. The high-priced software product may be of a higher quality, but at a tremendously higher financial price. Another big difference is that the open source system does not come with support. Technical support for high priced software is also rolled into its cost. If a company is not technically savvy and prefers to involve itself in the business of learning about source code, then perhaps the high price is warranted. Many different quirks in free software can be frustrating for inexperienced, non-savvy employees. Technical support may be a necessity for those types of companies. If a business is willing to undergo the risks of learning and supporting an open source system then the potential cost savings may be a reward. An extensive amount of money can be saved if freeware is used. However, tech-savvy employees are needed to deal with complications that arise with open source systems. Other Learning Management System providers such as Tracorp, offer a free Learning Management System as long as the company enters into an agreement to purchase courses.

Another is that not all Learning Management Systems are created equal. Some include more functionality than others. This can be a benefit if the purchaser is not exactly sure what they want. They can play with the system and see what features might be useful. However, too much functionality can bog down the system and be burdensome. Not enough functionality leaves the system useless. The UCAR-COMET Learning Management System must contain the precise amount of functionality and be available and customizable for the future. Some of these functionality traits include tracking of page level detail, book marking pages, and web-page building tools. Many Learning Management System companies have come and gone over the past ten years as

web technologies and online learning have grown. Purchasing software leaves COMET susceptible to investing in a high priced software system only to be left without tech support when the company ceases to exist.

There are many academically known Learning Management Systems such as the one used by Regis University, WebCT, Black board, E-college, and Jones International are also widely used among the university communities. Most of these systems are built around a forum where students can collaborate. In UCAR-COMET's case, learners are not collaborating as in a classroom environment. UCAR-COMET's learners take modules on independently and do not interact with other learners. These academic systems are not appropriate for UCAR-COMET's purposes.

Creating a custom Learning Management System from scratch where the source code knowledge is in the hands of the employees was attractive to UCAR-COMET. UCAR-COMET has a team already trained to create web-based training modules. Their skills include designing and developing websites, management of technical projects, instruction design, database design, and programming. Creating a Learning Management System was not above the staffs' knowledge base. The benefits of creating a Learning Management System in-house include:

- The source code is 100% owned
- The source code is in the control of UCAR-COMET
- The system is custom designed for COMET's needs
- Maintenance can be performed in-house
- The system resides in-house

- There are no concerns about Learning Management System providers going out of business
- There are no annual fees
- There are no initial high cost purchases

## **2.2 History of Learning Management Systems**

Just what is a Learning Management System? There are many different flavors of Learning Management Systems. A Learning Management System can be something as simple as a forum where students gather to communicate via text postings or as complex as a system that tracks every mouse click, every question answered, and the amount of time elapsed. The forum design is much like the Regis online environment via WebCT. As of this writing, forums have been around for more than 10 years. A forum provides a centralized place where students in specific classes can communicate, post class work, and comment about ideas or assignments. WebCT does have other features, but most Regis online classes only make use of the forum for communication. Right now, a type of forum that is popular is called a blog. A Blog (meaning weB-log) is pretty much a forum with a new name. There is nothing revolutionary about the blog, as media hype would have us believe.

As web-based training gained momentum over the last ten years, Learning Management Systems became a prevalent way to track users' web-based training efforts. Expensive, feature-rich Learning Management Systems are driven by the corporate sector. Countless e-learning companies have come and gone leaving many abandon Learning Management Systems in their path. One example of this evolution is



intellinex.com. Intellinex is a company that evolved from several e-learning companies. Intellinex is still in business, but their original Learning Management System called LEAP is now defunct. Companies who purchased the LEAP system are left with an unsupported, dead system. The company is left at the mercy of the Learning Management System creator. This story can be found over and over again. All one has to do to see the now defunct Learning Management System trail is consult last years e-learning expo guide. The e-learning expo is an annual trade show where Learning Management System creators display their systems. From year to year the company list changes. Learning Management Systems come and go like the wind. Although the corporate sector still purchases off-the-shelf systems, free, open source Learning Management Systems are now widely available.

### **2.3 Discussion of available shareware/freeware tools**

There are many types of shareware/freeware tools available to the consumer. Moodle is an example of a free, open source system that can be used as a Learning Management System. “It was created as a Ph.D. dissertation project, and has taken on a life of its own. Moodle is advertised as easy to install, use and maintain on Linux, Windows and Mac OS X platforms” (Berkeley). Moodle’s functionality includes forums, journals, quizzes, resources, and an area for displaying assignments. The administrative side of the system an assignment-tracking feature that time stamps a students work when uploaded to the server. The forum can be viewed as nested, flat or threaded, oldest or newest first. Moodle also has the ability to post photos with text messages. “Yahoo! Groups, Blackboard, and WebCT do not have this capability” (Berkeley). Although this

system is a good free solution, the UCAR-COMET wants to hold and maintain ownership of the system. Adopting a free system means that the UCAR-COMET technical staff must become familiar with the source code. Attempting to customize may end up being more work than building the system from scratch.

Another free Learning Management System considered by UCAR-COMET is the Jones International Learning Management System. The Jones International system is very much like the WebCT system used by Regis University. It allows different courses to be entered, forums can be established, and professors have administrative access to a grade posting area. As a real-world example of this system, the Jones International Learning Management System was successfully used by Metro College of Denver in the late 90s. During this time the Jones International system was a pay service that included support. Jones International decided to stop support of the system and it was made available as a free, open source download.

Although the Moodle Learning Management System and the Jones International Learning Management System are both free, there is still cost involved because UCAR-COMET programmers must interpret the source code in order to customize the system. Another issue is functionality of both free systems. The free systems use a forum environment that is not a desirable feature for UCAR-COMET. Ultimately, the programming staff at UCAR-COMET decided it would be more desirable to create a system from scratch where all the source code was known by the developers than to attempt to interpret a third party system. The decision to build from scratch gave UCAR-COMET the ability to include only the desired functionality. This simple functionality provided UCAR-COMET with a lightweight Learning Management System that is easily

expandable in the future. Having a staff that created the source code leaves UCAR-COMET with complete knowledge of the inter workings of the system.

## **2.4 Summary**

There were many Learning Management Systems from which to choose. Some Learning Management Systems are open source systems that are free of charge, others cost millions of dollars. Some Learning Management Systems have many features while others have few. Not all Learning Management Systems are created equal. The features that were desirable for UCAR-COMET are minimal and include tracking time in a module, location in a module, and quiz scores. Creating a Learning Management System from scratch, in house was the desired method for UCAR-COMET because UCAR-COMET now owns the system, the system can be easily changed, and the system includes only the desired functionality.

### **3.0 Chapter Three: Project Methodology**

#### **3.1 Research Methods Used**

The project attempted to follow the project lifecycle model including analysis, design, development, testing, implementation, and maintenance phases. Ultimately, the project used a rapid prototyping methodology meaning that the some amount, but not all of the analysis was preformed before moving ahead to the design phase, development on prototype pages were started before the design was complete, and so on. The project bounced between stages as needed. Some of the pieces like the php pages were more cyclical in nature. Small amounts of each phase were completed and then cycled through again for better flushing out of code and concepts. Overall, the project life cycle provided a good mapping of what was to be done, but reality dictated that some phases are revisited after they are complete.

#### **3.2 Analysis Phase**

During the analysis phase, project goals were refined into detailed functions and operations that the Learning Management System would exhibit. In the analysis phase, UCAR-COMET looked at the possible Learning Management System solutions. As discussed in the research section of this paper, the three main choices were to purchase an off-the-shelf system, use an open source system, or to build a custom system (Refer back to section 2.3 for details about the researched systems.). Sending a lot of money for an off-the-shelf system is not an option because UCAR-COMET is a non-profit agency with a small Learning Management System budget. Although UCAR-COMET researched using the free open source Moodle and Jones International systems, UCAR-COMET

wants the ability to own and control their system. UCAR-COMET did not want the complications of deciphering another party's source code and did not want to have to delete a lot of superfluous functionality. Tapping into the knowledge base already employed at UCAR-COMET in order to build a custom system was the most attractive avenue. Analysis of the off-the-shelf Learning Management Systems did not take long. A major partner in UCAR-COMET, the National Weather Service, underwent an off-the-shelf Learning Management System decision that proved to be extremely costly. The National Weather Services' work with the Geo-learning system allowed UCAR-COMET first hand knowledge and experience with a costly initial investment that continued to require substantial financial updates. This experience showed UCAR-COMET that a relationship with an off the shelf Learning Management System vendor can be expensive. Once a company is committed to a Learning Management System, it is not easy to change systems. Learning modules are linked into the system and data is stored in the database. These items are not easily transferred over to other systems due to differences in database table structure, database type, and methods for tracking web-based information.

### **3.2.1 Business Requirements**

UCAR-COMET requires that the Learning Management System be simple, easy to use, and cost effective. UCAR-COMET is interested in building a custom Learning Management System in order to control its features and to have ownership of the system. The driving business factor is the request from sponsors to implement a Learning Management System. The requirements are that the system track the time spent in a

module, the completeness of a module, and test scores associated with the modules.

These results are stored in the mySQL database and are available to the user and administrators via the php access pages.

### **3.2.2 Technical Requirements**

The Learning Management System must be easy to use. To begin, the user is first required to create an account to log into the system, which will be stored in a MySQL database.

List of requirements:

- If a user's browser crashes, the quiz score is recorded up to that point in the database
- If a user logs back in after a crash, the system ask the user if they want to resume where they left off
- A registration table stores user's personal information
- Each quiz and module taken is associated with the user
- Courses can be created by bundling multiple modules
- Course and module completion certification is provided
- The quiz must randomize the order of the questions
- Question types must include drop-down selections and multiple choice  
(See appendix A)
- The system must create desired reports (See appendix B) for a variety of users

- Quiz questions can be accompanied by a graphic, Flash swf, animation, etc.
- If a quiz is taken more than once by the same individual, it is over written by the new answers (i.e. the user can improve their score)

### **3.2.3 Software Requirements**

The software used to develop the UCAR-COMET Learning Management System includes MySQL open source database management software, a free download from [mysql.com](http://mysql.com), Apache open source web server software available as a free download from [apache.org](http://apache.org), and php which is “a widely-used general-purpose scripting language that is especially suited for Web development and can be embedded into HTML (PHP.net).” Php code can be edited in a text editor program such as vi or notepad. The primary tool used to create php code is Dreamweaver, a web page editing software. SQL is used to query the database and php displays these results as output in a web-based format.

### **3.2.4 Reporting Requirements**

Reporting of data is imperative in the success of the project.

Reporting requirements include:

- The number of quizzes taken per month for each quiz
- The total head count of users registered in the system by affiliation
- Maximum, minimum, and average quiz score results
- Percentage of time an answer has been selected for each question in a quiz
- Number of people taking quizzes from the private sector

- Individual scores on quizzes
- Individual success on entire modules
- Module completion data
- Question by question analysis

### **3.2.5 Training Requirements**

The UCAR-COMET staff members that require access to the Learning Management System are limited to a small number of people. Training on the administration side of the system was conducted in a classroom environment on site. The training time only took 1-2 hours, as the system is not complicated. Training topics include how to enter quizzes into the system and running reports on the data. The training was accomplished using a PowerPoint presentation accompanied by a brief introduction to the Learning Management System software. Many of the employees that interact with the administration pages are the same employees who built the system. These employees already have a thorough knowledge of the system. They did not need an extensive, intricate introduction to the software and its purpose.

There was no training of the user side of the system. It was assumed that users of UCAR-COMET web-based training modules already possessed the ability to interact with these few, strait forward web pages because all UCAR-COMET modules are web-based to begin with. The user experience is similar to any other web-based registration that may occur on a third-party website. However, support is available to users via an email contact at UCAR-COMET should a user be unable to complete the registration or



have other technical issues. The UCAR-COMET support person replies, in a timely fashion, to individual support requests as they are received.

### **3.3 Design Phase**

The first step in the design phase was to gather requirements and to create a wish list based on managers' meetings. These meetings established desired features including screen layouts, business rules, process diagrams, and pseudo code. Research showing what types of features were included in off-the-shelf Learning Management Systems was analyzed and considered. Sponsors dictated the basic requirements they desired. Those requirements consisted of a database system that would track time in a module, module completeness, and quiz scores based on each individual user.

The initial design was done in html text descriptions and hyperlinks. Ultimately, php pages were used as the GUI for both user and administrator. Style sheets controlled the layout, color, and fonts in the GUI. These style sheets were created to allow for ease of change throughout the life of the project.

UCAR-COMET's chief database programmer completed the database design. The database programmer created SQL code, tables, and table relationships. The table layout created in mySQL can be seen in appendix D. Php code was primarily generated by Dreamweaver, a web page editing software. UCAR-COMET's primary programmer created the php source code and tested it against the mySQL database. To see example php code see appendix C.

#### **3.3.1 The Project Plan**

The project plan is built around five phases of the project life cycle. The first phase was an analysis of the current situation and the available options. The analysis showed that UCAR-COMET was without a Learning Management System. The available options were to adopt a freeware system, purchase a system, or build a custom system. The second phase focused on the project design. Decisions about screen layout, features, and look and feel were made. The third phase was the project development. All database tables and php GUI access pages were created. The forth phase was the testing phase. All the created pages and database were tested. The database was populated with data in order to test php pages including reports. The fifth and final stage of the project was project maintenance. The maintenance included additions, corrections, and changes, as management deems necessary. The system is predicted to last at least five years but could be maintained longer depending on changes in technology and future Learning Management System trends.

### **3.3.2 The Support Plan**

The support plan includes support of the system and support of the end user. Supporting the system is the responsibility of the database administrator at UCAR-COMET. Supporting the end user is done via email. An email contact under a technical support page is available to the end user. Email support goes to the entire IT staff, which includes five people. The IT staff responds to support questions depending on their ability to provide support for a give question. The expectation for support is an average of one email per day from users. One primary support contact responds to the users. The time commitment is expected to be less than 5% of the individual's daily workload. Inside

users of the system such as managers receive support from the same support individual. The time commitment to support managers and staff is less than 5% of daily workload. Support totals for this one individual are estimated at less than 10% of daily total workload.

### **3.3.3 The Training Plan**

The entire UCAR-COMET staff completed testing. The staff was asked to enter the system as end users and register. After registration was complete, the staff was asked to enter modules and take quizzes. The database administrator gauged the load on the server and took comments from the staff. They also looked over the data generated and the communication of that data. The comments were collected and reviewed by management. They were reviewed to make sure the system was working correctly and that it was providing accurate and desired results. Comments may be addressed or revisited depending on the collective decision of management. Adjustments were made depending on the decision of management and the IT department. IT tested the administrative side of the system by entering quizzes and linking modules.

### **3.4 Development Phase**

The first part of the system to be developed was the servers. Both database and web server were configured and made operational. The next step was to set up MySQL database software on the database server. Tables, relationships, and basic SQL were created in the mySQL environment. Some minimal test data was loaded into the database to test the SQL statements. See appendix D for an example of the mySQL SQL testing

feature. Once the database environment was complete and tested, php page creation began. Building and testing the php pages against the database along the way made it easy to ensure proper functionality. After the development of the system was complete, the system was made live on the UCAR-COMET test web server. The test system can be accessed via <http://deved.meted.ucar.edu>. The final working system was moved to the actual web server after testing was complete <http://meted.ucar.edu>. The developed portion of the test site is the development server. This is a working copy that resided on the same physical server. Development, changes, and testing is always done on the testing server and then moved to the Meted side when complete.

#### **3.4.1 Build database**

The database tables and relationships were created in a mySQL environment. The mySQL environment is a php based GUI interface (see appendix C for an example). The tables and relationships are based on what was decided in the design phase. Each module has a unique identifier number that is linked to other records in the database. The module number is attached to a user after they complete a module. The quiz score is associated with a user and the module. The main three links are user, module, and quiz score.

In addition to the user information and quiz scoring that are stored in the database, each module contains quiz questions. Each learning module has a quiz with an unlimited number of questions. Each question is stored in the database. A question can be multiple choice or dropdown. See appendix C for examples of the types of questions available.

#### **3.4.2 Build interface**

The interface pages were built using php. The php code was created in Dreamweaver or hand coded in a text editor. Pages were designed based on specifications created in the design phase. The specifications include the use of a style sheet on all html and php pages in order to make future, global revision easy. Styles used provide easy to read text layout and colors consistent with the overall Meted website look and feel. See appendix D for example php code. For examples of the completed user GUI pages, see appendix A. For examples of completed administrative GUI pages, see appendix B. All pages were built with style sheets to allow for easy look and feel changes if required.

### **3.4.3 Server setup**

The servers are UNIX servers. One server is the web server where Apache web server software and all the GUI php interface pages are located. The second UNIX server is the mySQL database server. The system consists of two physical server environments. The web server is open to the web and therefore more vulnerable to hackers. The mySQL database resides inside the firewall and is therefore safer. Only the database administrator has access to the mySQL table structure. The systems are backed up via UCAR-COMET's existing tape back up system, which is responsible for backing up all UCAR-COMET learning module work.

### **3.5 Testing Phase**

Testing brought all the pieces together into a special testing environment. A click through of all user and administrator GUI pages was conducted. The click through ensures that there are no broken links and that links take the user to the proper location.

Test data was loaded into the database so that test reports could be run. Dreamweaver debugging feature was used to test php code for bugs. The UCAR-COMET staff was involved in the testing phase. Every employee was asked to register and take quizzes in the system. This load test attempted to emulate the live user experience. After the in house testing was complete, reports were run to see the test totals.

### **3.5.1 Test database**

Testing the database involves three different levels of testing. First, loading test data confirms the functionality of the database table structure. Second, reports are run on the test data to prove the expected results of the data returned. Third, in addition to report testing, load testing is performed. The UCAR-COMET staff does the load testing. The staff accesses the user GUI pages all at the same time in order to test performance of the database. Testing make sure that data is compiled and presented correctly, the server can handle the traffic, and determines whether there are any other system bugs to report.

### **3.5.2 Test interface**

The IT staff does interface testing to ensure that all fields, links, and buttons in the php pages are functional first. This is called the click through. The UCAR-COMET staff performs a second test and uses similar techniques in a more random fashion. Any issue is reported to and fixed by IT. Comments on the interface layout are also taken. Management discusses these comments and any changes are decided upon by their team. The IT staff tests administrative pages. Multiple IT staff personnel access all php pages. The IT staff enters quizzes into the database via the administrative php pages (see

appendix B for examples). All errors are reported to the database administrator and the errors are corrected. When an error is corrected, the database administrator emails the IT staff and asks them to test the affected section again. The process continues in a cyclical fashion. Once the IT staff deems the pages usable, testing is complete.

### **3.5.3 Test server**

Testing the server was accomplished through the interface and database testing. When the test of the interface and database were complete and successful, the server was deemed functional. Web server stats were also monitored using Apache's built in website statistics software.

### **3.5.4 Develop maintenance plan**

The UCAR-COMET database administrator conducts long-term maintenance, which involves periodic software upgrades as the manufactures of the software make updates available. MySQL updates are completed, as newer versions are available. Occasional security updates of the Apache web server and php code are also completed. Comments and suggestions are continuously reviewed, considered, and adjusted as needed.

## **3.6 Maintenance Phase**

As new releases of mySQL become available, the on staff database administrator upgrades the database. The business plan calls for the system to be operational for at least five years. Hardware maintenance on the UNIX server may be required during this time.

These can include monitoring disk space or simply rebooting. Change orders are expected as ongoing manager meetings and user feedback is gathered. Correction of code may occur as bugs are detected. The database administrator at UCAR-COMET conducts primary, long-term maintenance.

### **3.6.1 Managing upgrade requests**

Upgrade requests are given to the database administrator by management. All upgrade requests are filtered through management. Management is responsible for approving any upgrade request. If an upgrade is approved, the IT staff determines the appropriate person on staff to conduct the update depending on their skills.

### **3.6.2 Maintain database**

The database administrator performs database maintenance. Maintenance includes updates to the MySQL software as newer versions become available, purging old data, and conducting database backup to ensure database optimization.

### **3.6.3 Maintain server**

UNIX server maintenance is almost non-existent. The UNIX server up time is so reliable it is virtually a maintenance-free machine as compared to other server environments such as Windows, which have a tendency to need constant rebooting. The UNIX server environment is expected to support beyond the life of the project. The UCAR-COMET network administrator performs maintenance, should maintenance be



necessary. The UCAR-COMET IT staff is already familiar with and prefers the UNIX environment.

#### **3.6.4 Project closure**

Completion of the Learning Management System marks official project closure although system maintenance and upgrades continue throughout the life of the system. Testing was the last phase before closure was accomplished.

#### **3.7 Milestones**

Project milestones include:

- Completion of the analysis phase
- Completion of the design phase
- Completion of the development phase
- Completion of the testing phase
- Project launch which marks the beginning of the maintenance phase

#### **3.8 Outcomes**

Project outcomes include:

- Functional GUI php user pages
- Functional GUI php administrator pages
- Functional mySQL database
- Sponsors approval of the Learning Management System
- Management approval of the Learning Management System

## **4.0 Chapter Four: Project History**

### **4.1 How the project began**

As Learning Management Systems became the norm for web-based training, UCAR-COMET's sponsors requested the implementation of a Learning Management System in order to better track its employees' learning module progress and comprehension. Since the National Weather Servers had a negative experience with an off-the-shelf Learning Management System, it was deemed that building a custom system would be the best solution for UCAR-COMET. Support for building the custom Learning Management System came from UCAR-COMET's sponsors and management.

### **4.2 How the project was managed**

Three top-level managers at UCAR-COMET managed the project. These managers directed the analysis, design, development, testing, implementation, and maintenance of the Learning Management System. They coordinated communication and cooperation between different employees and departments within UCAR-COMET to complete the Learning Management System.

Overall, the management team was effective. The Learning Management System was completed on time and within expected budget. The technical nature of UCAR-COMET's business allowed the development staff to work autonomously for much of the project life cycle.

Now that the project is complete, the IT staff and UCAR-COMET management communications have reduced to an as needed basis.

#### **4.3 Was the project considered a success?**

The project was a success. Currently there are more than 2000 users registered in the UCAR-COMET Learning Management System. Those 2000 users have taken more than 9000 quizzes to date. There are more than 100 modules and quizzes available in the Learning Management System. (<http://meted.ucar.edu>).

The php pages (GUI) are simple and easy to use. The mySQL database has handled the user load. The system up time is acceptable and rarely requires reboot.

Support occasionally receives a complaint about the storage of personal information and the tracking of quiz scores. However, the requirement to provide personal information is only necessary if the employer is requiring that the quiz score and progress be tracked. Support is directed to inform the person that they should take the issue to their supervisor. Module and quiz access is available without registration as long as the person does not need information tracked for job requirements.

#### **4.4 What changes occurred to the plan?**

Report requirements changed throughout the project life cycle. Ultimately, a “create your own report” feature was added to try to accommodate any reporting request (See appendix B). The GUI screen layout changed continually and is still being refined today. The screen layouts have become part of the ongoing maintenance of the system. Since there were many testers at UCAR-COMET looking at the GUI pages, many comments were collected about the overall appearance. The appearance ended up being altered numerous times during the project life cycle. However, the look and feel, the

appearance of the GUI pages, is in the eye of the beholder and is likely to continue to evolve.

#### **4.5 How did the project end?**

Although the project went live and was considered a success, it continues to evolve to this day. Testing was effective, but bugs are occasionally discovered and resolved. UCAR-COMET sponsors are happy with the Learning Management System and continue to add modules as required job training is enhanced. As more people require the UCAR-COMET training, the user base will grow. The current user base of more than 2000 has exceeded the expectations of UCAR-COMET sponsors and managers.

#### **4.6 What went right and what went wrong?**

The completion of the physical system was a success. All the php coded GUI pages are acceptable and functional (see appendix A & B). The MySQL database is acceptable and functional (see appendix D). The functioning database and php pages are examples of things that went right. Managing change is hard for any project and UCAR-COMET's managers are responsible for managing all the change to the Learning Management System. An example of something that went wrong is the change management plan. Unfortunately, the IT department must respond to all change requests that management delivers. Better planning of requirements may have lessened the amount of change requests post project completion.

The Learning Management system was completed on time and on budget. Although the time line was not a diving force, the system was operational within the

expected time frame. As stated above, changes to the system are continually being made. As feedback from users comes to management's attention, change requests are discussed and then decisions on changes are given to the programming staff. Most changes are small and do not require much time to implement. Examples of small changes include style sheet changes that affect the look and feel of the user and administrative pages.

#### **4.7 Project Summary**

The UCAR-COMET Learning Management System is successful because it serves the intended purpose, which is to track a user's progress through a module, their completeness of the module, and their quiz score related to the module. The timeline was kept and regularly scheduled work was not interrupted any more than anticipated. Currently there are more than 2000 users registered in the UCAR-COMET Learning Management System. Those 2000 users have taken more than 9000 quizzes to date. There are more than 100 modules and quizzes available in the Learning Management System. (<http://meted.ucar.edu>). UCAR-COMET's sponsors are satisfied with the Learning Management System and are able to now gauge an employee's progress through the module tracking features.

UCAR-COMET's programming staff continues to maintain and implement changes to the system. One primary programmer is responsible for handling the maintenance and change whether that means working independently or requesting other IT staff's help.

## **5.0 Chapter Five: Lessons Learned**

### **5.1 What was learned from the project experience?**

After completion of a working, implemented system, the project was deemed a success. It was quickly learned that not all functionality was designed into the system, however. Additional reports were requested after competition. Specifically, the report that shows how many private sector users are accessing modules was added late in the project life cycle. In addition, the ability to create a custom report was added later in the project life cycle. These additional reports were simple enough to generate, as they only required SQL to be performed on the database and php access page to display results.

The look and feel continues to change as users and managers offer feedback on the current system. UCAR-COMET has a tendency to react too quickly. If one user makes a comment about the legibility of a page, the page is immediately changed to attempt to make that one user happy. This may not be a sustainable maintenance plan. According to UCAR-COMET policy, a change request from a user must occur more than one time in order for it to be up for consideration. Then, the management team and IT must agree that the change is warranted before a change is implemented.

Occasional database errors cause users quiz scores to be dropped. This problem cannot be fully confirmed and is based on the occasional support email from a user claiming to have taken a quiz where no score is found. Since the nature of technology is not foolproof, adjustments are made to quiz scores on the honor system. Perhaps with an enterprise database system such as Oracle, dropped data would not be expected. However, with the use of the free MySQL database, occasional errors are tolerated. The

database administrator has come to the conclusion that restarting the database on a monthly basis seems to help prevent lost data. This issue is being looked into further.

As newer versions of software have come available they have been upgraded on the system. One example of where this became problematic is with the latest version of php. When the new software was installed on the system all php pages were temporarily unavailable. Although a work around was quickly established, a proper understanding of the effects in the newer version were to blame.

UCAR-COMET learned that purchasing a Learning Management System was expensive, using an open source system was risky, and building a custom system was the desired path. The custom system solution allowed UCAR-COMET to construct a simple system that only had the desired functionality. Working with a small on-staff team made changes to the system easier than dealing with outsourcing. Because the project was small and the team was small, impromptu meetings could be held to discuss the direction of the Learning Management System. It was learned that this small project and team were a very manageable task.

However, even though the project is complete and operational, change requests continue to be generated. Just as with any project, it can continue on forever if the powers allow it to be so. Although the small size of the project and team are a benefit in some regards, it is a hindrance when it comes to change requests. The small team environment makes it easy for managers to request changes on the fly. Since it is known that the system is relatively simple, changes are also perceived as simple. Learning how to live with this process for the life of the project is between the managers and the support staff who must implement the change.

## **5.2 What should have been done differently?**

There were many lessons learned while planning and initiating this project. Most importantly, more requirements and parameters should have been created up front. Greater detail in the user and administrative page layout might limit the numerous changes that are occurring based on one or two users' opinions. In addition, the more stringently set the layout and parameters were, the fewer and less necessary changes became warranted. Too often systems are built and only then do managers realize what they really wanted is something very different. If more time were spent during the planning phase on important details, managers would have been required to make binding decisions at that time so fewer changes were needed after development.

The UCAR-COMET Learning Management System was built using flexible technology. Making changes to php layout or adding tables to the mySQL database are not usually difficult tasks. However, as more and more parties become involved in the change request process, ideas frequently clash and the work becomes more tedious and time is wasted.

System requirements should have been better defined. Features were added to the project scope towards the end of the project. One example of a significant change that occurred late in the project is the addition of course level tracking. Originally, modules were the top-level for tracking. It was decided late in the project that modules should be able to be lumped together to form a course. Although this functionality was added to the user interface pages, (see appendix A for an example) the reports are unable to search on a course level and if a user is at the module level, there is no indicator to let them know



that the module is also part of a course. The integration of the course level element came late in the project and usability of the feature suffers because of this fact.

Another feature that is currently being discussed has to do with the end of quiz scoring display. Right now, the user's quiz score is displayed for them and they can see which question they got correct or incorrect. The feature that would make this function better is the addition of linking back to module content that relates to each question. Currently there is no way to link into the content from a quiz question. If a user could link to the area of content, they could review the material and discover why they missed a question. This adds instructional value that was overlooked in the initial build. The addition of the feature is currently under review.

### **5.3 Did the project meet expectations?**

The project did meet the layout requirements by sponsors and management. The system is up and running and has thus far required little maintenance. Reports can be generated to meet the needs of management. Users have been able to access and register on the system without too much trouble. Occasionally, users' might forget their passwords, so emails are sent to request help. Users also have trouble with quizzes. Because the quizzes are web-based, technical problems can occur such as user browser's crash.

These project goals were accomplished:

- Created, owns and maintains the Learning Management System
- Track progress and success on a module
- Easy to use for both users and administrators

- Modular to allow future additions
- Work was done in house with the current staff
- Can collect, analyze, categorize, and send data.
- A six-month completion time line met.

#### **5.4 What is the next stage of the project?**

The next step of the project is to continue evaluating the system in order to determine the next appropriate level of functionality. UCAR-COMET management will review comments from users as they come in to determine where common themes indicate a need for change.

#### **5.5 Summary**

UCAR-COMET's sponsors requested the addition of a Learning Management System to track users learning module activity. UCAR-COMET responded by providing a fully functional Learning Management System that met all requirements. All Business Requirements, Technical Requirements, Software Requirements, Reporting Requirements, and Training Requirements were met. The existing UCAR-COMET technical staff built the Learning Management System. UCAR-COMET learned from the mistakes of the National Weather Service and avoided the high cost of an off-the-shelf Learning Management System. UCAR-COMET now wholly owns and maintains the custom Learning Management System. Sponsors, managers, and UCAR-COMET staff are all pleased with the Learning Management System.

## **REFERENCES**

Apache website. Obtained December 18, 2005. <http://www.apache.org/>

Berkeley website. Obtained December 20, 2005. <http://www-writing.berkeley.edu/TESELJ/ej26/m2.html>

COMET website. Obtained December 30, 2005. <http://www.comet.ucar.edu>

Interact website. Obtained December 20, 2005. [http://www.interactLearningManagement Systems.org/spaces/space.php?space\\_key=1](http://www.interactLearningManagementSystems.org/spaces/space.php?space_key=1)

Jones International website. Obtained December 22, 2005. <http://www.jones.com/>

MySQL website. Obtained December 18, 2005. <http://www.mysql.com/>

PHP website. Obtained December 18, 2005. <http://www.php.net/>

Tracorp website. Obtained December 22, 2005. <http://www.tracorp.com/>

## **Appendix A: The User Experience**

## Access Point

The user gains access into the UCAR-COMET Learning Management System via this simple GUI front page. The user must create an account if one has not already been created.

The screenshot shows a web browser window titled "MetEd Registration Home - Mozilla Firefox". The address bar displays "http://deved.comet.ucar.edu/registration/index.php". The page features a blue header with the "MetEd Registration & Assessment" logo and the text "Operated by the COMET Program" and "Serving meteorologists since 1989". The main content area includes a welcome message, a description of the registration process, a privacy policy link, and a registration button. Below this is a member login section with fields for email and password, a sign-in button, and a forgot password link. At the bottom, there is a section for taking a module quiz with a link to the list of available quizzes. The footer contains copyright information for 2003-2005 and a link to legal notices.

**MetEd Registration & Assessment**  
Operated by the **COMET** Program  
Serving meteorologists since 1989

Welcome to the MetEd Registration and Assessment homepage!

By registering on this site, you will be able to track your progress in completing COMET® modules. When you elect to save your results, achieving a passing score on a module quiz earns you a certificate of completion and stores this score and completion status in your personal record.

This site complies with the [UCAR Privacy Policy](#), however, with user authorization, progress and quiz results may be shared with user employers, organizations, or universities. Please note, results will only be shared with the user's authorization.

Registration is easy! Just provide some information about yourself, and you're ready to track your progress through the learning modules.

**New User Registration**

[Register Now](#)

**Member Login**

Sign in to take a quiz, review your results or modify your information.

E-mail:

Password:

[Sign In](#)

[Forgot your password?](#)

**Take a module quiz**

[List of available quizzes](#)

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[Legal Notices](#)

## Registration

Standard information is collected from the user and stored in the mySQL database.

The screenshot shows a web browser window titled "MetEd User Registration - Mozilla Firefox". The address bar shows the URL "http://deved.comet.ucar.edu/registration/registerForm.php". The page header features the "MetEd Registration & Assessment" logo, with the text "Operated by the COMET Program" and "Serving meteorologists since 1989". The main heading is "MetEd User Registration".

The registration form includes the following fields and instructions:

- E-mail\* (required)
- First name:
- Last name:
- Password\* (Up to 10 characters in length)
- Retype password to verify\* (required)
- Password Reminder\* (required)
- Affiliation: (dropdown menu)
- Supervisor/Instructor Email: (Quiz results will be sent here)
- Address:
- City:
- State/Province: (dropdown menu)
- Zip/Postal Code:
- Country:

Below the form, there are two checkboxes:

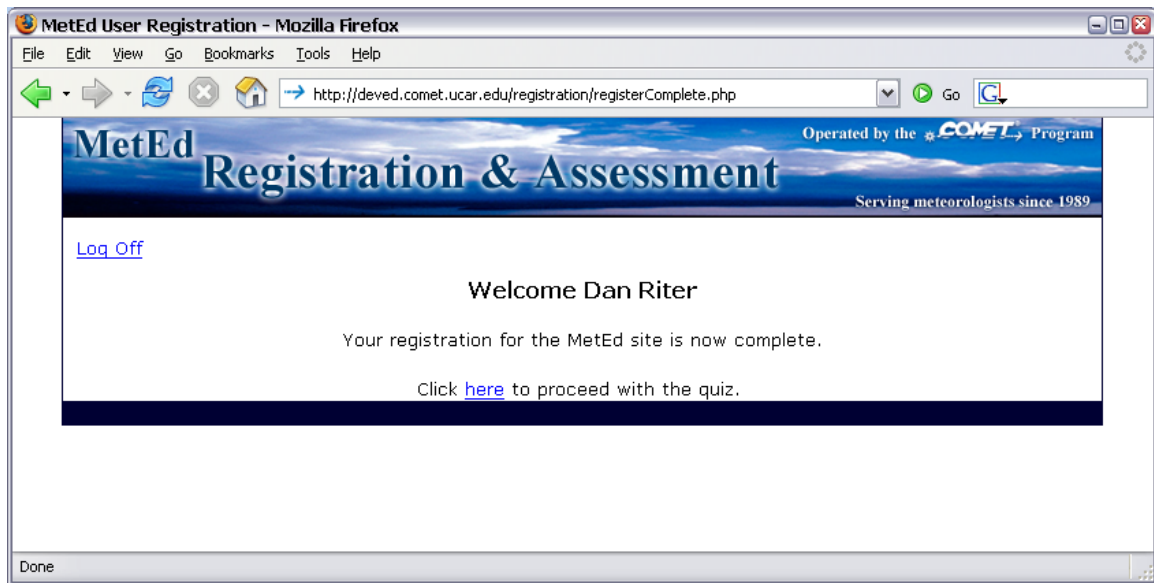
- ☐ Yes, my progress and quiz results may be shared with my employer, organization, or university.
- ☐ Yes, add me to the email list to receive periodic updates from the COMET® Program.

A note states: "\* indicates required field". At the bottom of the form are "Submit" and "Cancel" buttons.

The footer contains the copyright notice: "Copyright 2003-2005, University Corporation for Atmospheric Research. All Rights Reserved." and a link to "Legal Notices".

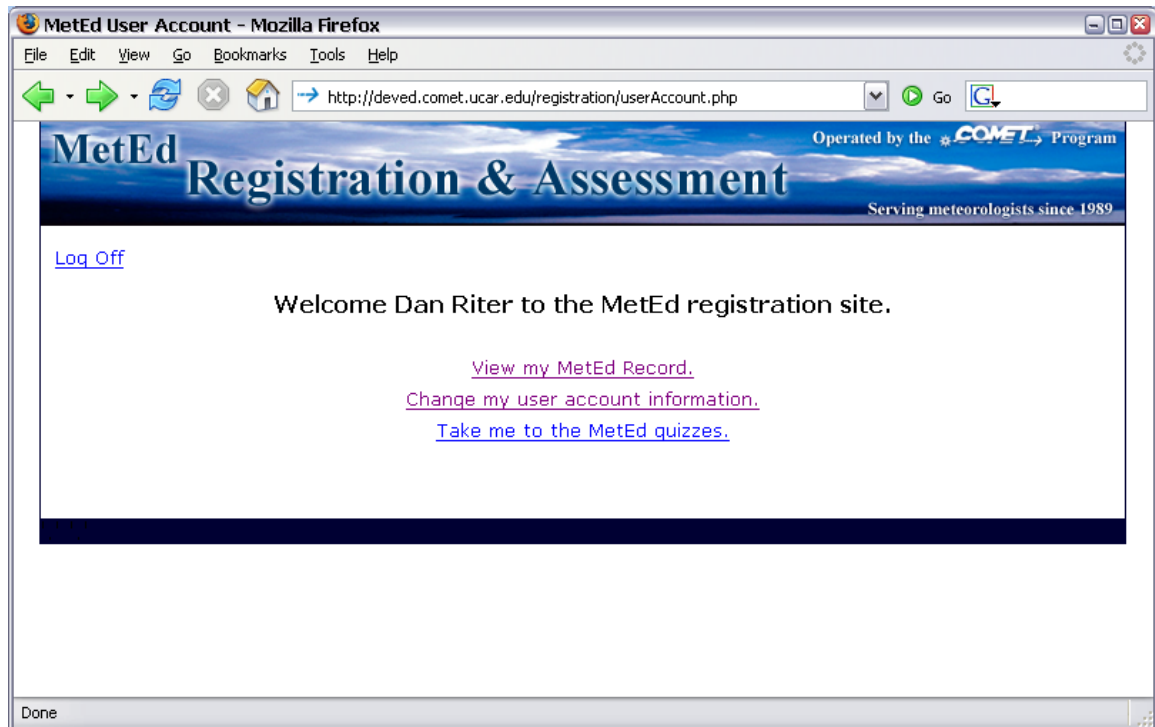
## Welcome

Once the registration is complete, the user is welcome into the system.



## User Options

When a user logs into the system they have several options shown below.





## User Records

A user can view a record of all quiz information stored. In this example there is one records stored.

The screenshot shows a Mozilla Firefox browser window titled "MetEd User Registration - Mozilla Firefox". The address bar displays the URL "http://deved.comet.ucar.edu/registration/quizResults.php". The page header features the "MetEd Registration & Assessment" logo, with the text "Operated by the COMET Program" and "Serving meteorologists since 1989". A "Log Off" link is visible in the top left corner.

The main content area displays the "MetEd Record for Dan Riter". Below this, there are two tables: "Courses" and "Topics".

**Courses Table:**

Course Name	Score	Passed	Submitted

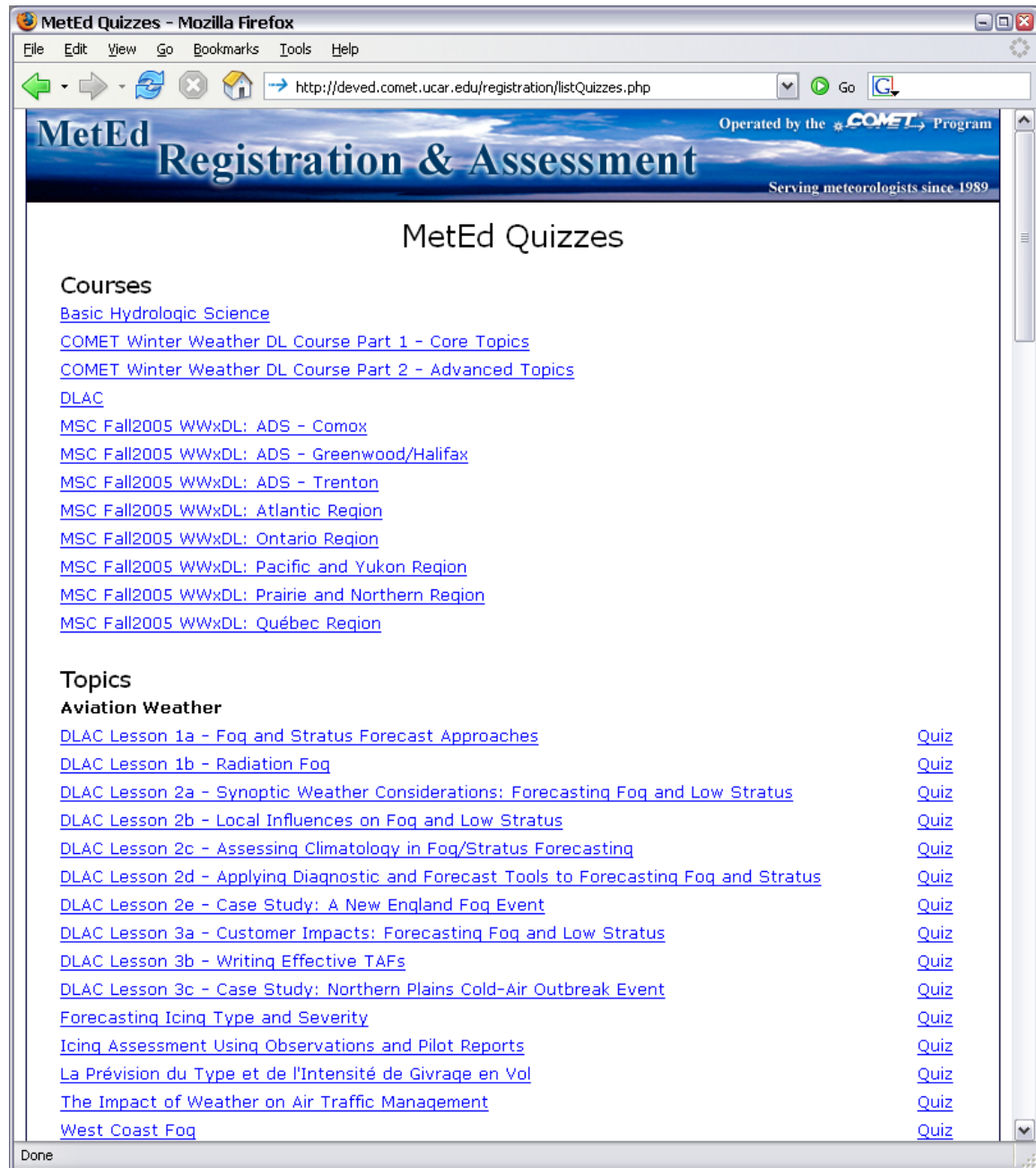
**Topics Table:**

Quiz Name	Score	Passed	Submitted
<b>Climate</b>			
Creating a Local Climate Product Using Composite Analysis	29	No	12/13/2005

At the bottom of the record, there is a link to "Return to the [main registration page](#) or to your [account page](#)".

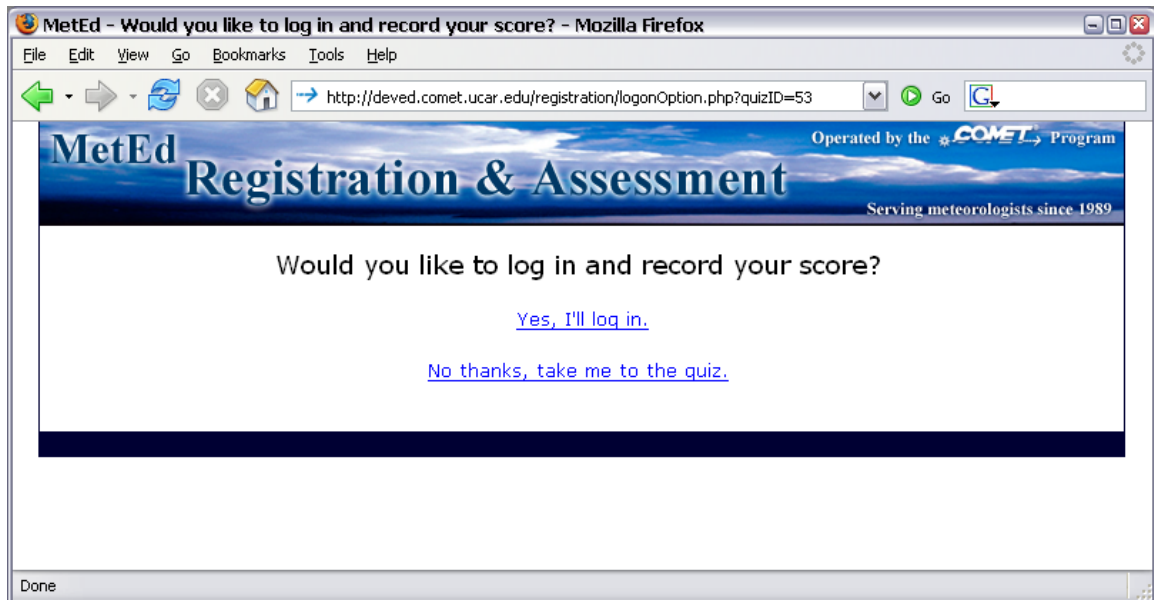
## **Module and Quiz list**

The user can now access any of the learning modules and quizzes available at UCAR-COMET.



## Log in Message

This list of modules and quizzes is available even if the user does not create an account. The user is informed that their information will not be tracked.



## Sample Question

Below is an example multiple-choice question from one of the UCAR-COMET quizzes. The user has the option to make a selection and save or skip the question. If the question is skipped, the user will be reminded to answer the question before the quiz is completed. This message occurs on the final question page.

The screenshot shows a Mozilla Firefox browser window with the title 'DLAC Lesson 2c - Assessing Climatology in Fog/Stratus Forecasting - Mozilla Firefox'. The address bar shows the URL 'http://deved.comet.ucar.edu/registration/prepQuiz.php?sequenceNumber=18'. The page content includes a header for 'MetEd Registration & Assessment' with the text 'Operated by the COMET Program' and 'Serving meteorologists since 1989'. The main heading is 'DLAC Lesson 2c - Assessing Climatology in Fog/Stratus Forecasting (54 Total Points, Passing Score is 75%)'. Below this is 'Question 1 of 15 (4 Points)'. The question text is 'Select the statement(s) that describe the appropriate applications of climatology data. Choose **all** that apply.' There are four checkboxes with corresponding text: 'Can be used to determine what processes caused the fog or stratus', 'Can be used to analyze the current synoptic and mesoscale setting', 'Can be used to understand whether past conditions are similar to the current meteorological situation', and 'Can be used to forecast extreme or unusual events'. At the bottom of the question area are two buttons: 'Skip Question' and 'Save Answer and Continue'. The status bar at the bottom of the browser shows the URL 'http://deved.comet.ucar.edu/registration/logonOption.php?quizID=53#1'.

DLAC Lesson 2c - Assessing Climatology in Fog/Stratus Forecasting  
(54 Total Points, Passing Score is 75%)

Question 1 of 15 (4 Points)

Select the statement(s) that describe the appropriate applications of climatology data.  
Choose **all** that apply.

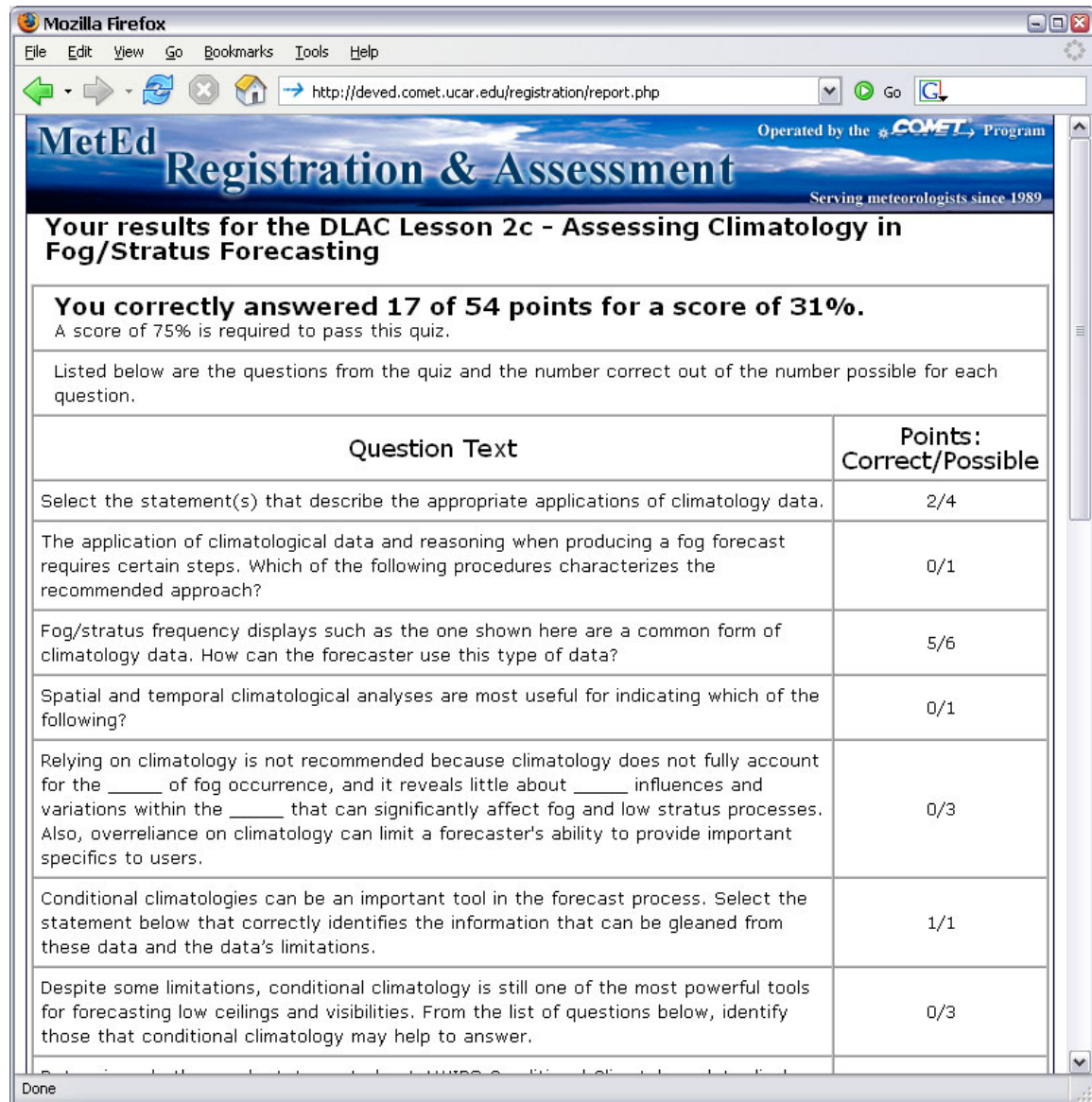
<input type="checkbox"/>	Can be used to determine what processes caused the fog or stratus
<input type="checkbox"/>	Can be used to analyze the current synoptic and mesoscale setting
<input type="checkbox"/>	Can be used to understand whether past conditions are similar to the current meteorological situation
<input type="checkbox"/>	Can be used to forecast extreme or unusual events

Skip Question Save Answer and Continue

http://deved.comet.ucar.edu/registration/logonOption.php?quizID=53#1

## Quiz Results

Once a quiz is complete the user is given a score, a list of questions, and the correct/incorrect scoring.



**MetEd Registration & Assessment**  
Operated by the **COMET** Program  
Serving meteorologists since 1989

**Your results for the DLAC Lesson 2c - Assessing Climatology in Fog/Stratus Forecasting**

**You correctly answered 17 of 54 points for a score of 31%.**  
A score of 75% is required to pass this quiz.

Listed below are the questions from the quiz and the number correct out of the number possible for each question.

Question Text	Points: Correct/Possible
Select the statement(s) that describe the appropriate applications of climatology data.	2/4
The application of climatological data and reasoning when producing a fog forecast requires certain steps. Which of the following procedures characterizes the recommended approach?	0/1
Fog/stratus frequency displays such as the one shown here are a common form of climatology data. How can the forecaster use this type of data?	5/6
Spatial and temporal climatological analyses are most useful for indicating which of the following?	0/1
Relying on climatology is not recommended because climatology does not fully account for the _____ of fog occurrence, and it reveals little about _____ influences and variations within the _____ that can significantly affect fog and low stratus processes. Also, overreliance on climatology can limit a forecaster's ability to provide important specifics to users.	0/3
Conditional climatologies can be an important tool in the forecast process. Select the statement below that correctly identifies the information that can be gleaned from these data and the data's limitations.	1/1
Despite some limitations, conditional climatology is still one of the most powerful tools for forecasting low ceilings and visibilities. From the list of questions below, identify those that conditional climatology may help to answer.	0/3

Done

## **Appendix B: The Administrator Experience**

## Create or Edit Quizzes

This admin access screen allows an admin to create a new quiz or edit an existing quiz.

Quiz Creator - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://inside/quiz\_creator/index.php

Go

**MetEd**  
Meteorology Education & Training

Operated by the **COMET** Program

Serving meteorologists since 1989

[Quiz Reports](#)

Create a New Quiz

OR

Select an existing quiz

(This will change the active status to "no" for both the MetEd and deved sites.)

Quiz Name	Deved Active	MetEd Active	Creator
<b>Aviation Weather</b>			
<a href="#">DLAC Lesson 1a - Fog and Stratus Forecast Approaches</a>	yes	yes	Dan Riter
<a href="#">DLAC Lesson 1b - Radiation Fog</a>	yes	yes	Vickie Johnson
<a href="#">DLAC Lesson 2a - Synoptic Weather Considerations: Forecasting Fog and Low Stratus</a>	yes	yes	Vickie Johnson
<a href="#">DLAC Lesson 2b - Local Influences on Fog and Low Stratus</a>	yes	yes	Vickie Johnson
<a href="#">DLAC Lesson 2c - Assessing Climatology in Fog/Stratus Forecasting</a>	yes	yes	Vickie Johnson
<a href="#">DLAC Lesson 2d - Applying Diagnostic and Forecast Tools to Forecasting Fog and Stratus</a>	yes	yes	Vickie Johnson
<a href="#">DLAC Lesson 2e - Case Study: A New England Fog Event</a>	yes	yes	Seth
<a href="#">DLAC Lesson 3a - Customer Impacts: Forecasting Fog and Low Stratus</a>	yes	yes	Vickie Johnson

Done

## New Quiz

The first step in create a new quiz is to enter some basic information about the quiz. This page has been customized to represent the meteorological learning modules UCAR-COMET provides.

The screenshot shows a web browser window titled "MetEd - Create a new quiz - Mozilla Firefox". The address bar shows the URL "http://inside/quiz\_creator/newQuiz.php". The page features a banner for "MetEd Meteorology Education & Training" with the text "Operated by the COMET Program" and "Serving meteorologists since 1989".

**Create a new quiz**

New quiz name:   
(Usually the name of the module)

Enter the full URL for the module (ex. <http://meted.ucar.edu/dlac/lesson1/index.htm>)

Choose the topics this quiz should be listed under:

<input type="checkbox"/> Aviation Weather	<input type="checkbox"/> Climate
<input type="checkbox"/> Coastal Weather	<input type="checkbox"/> Convective Weather
<input type="checkbox"/> Emergency Management	<input type="checkbox"/> Fire Weather
<input type="checkbox"/> Fog and Low Stratus	<input type="checkbox"/> Hurricanes/Tropical
<input type="checkbox"/> Hydrology/Flooding	<input type="checkbox"/> Marine Meteorology
<input type="checkbox"/> Mesoscale Meteorology	<input type="checkbox"/> NWP
<input type="checkbox"/> Other	<input type="checkbox"/> Satellite Meteorology
<input type="checkbox"/> Space Weather	<input type="checkbox"/> Winter Weather

Created by:

Percentage required to pass quiz:

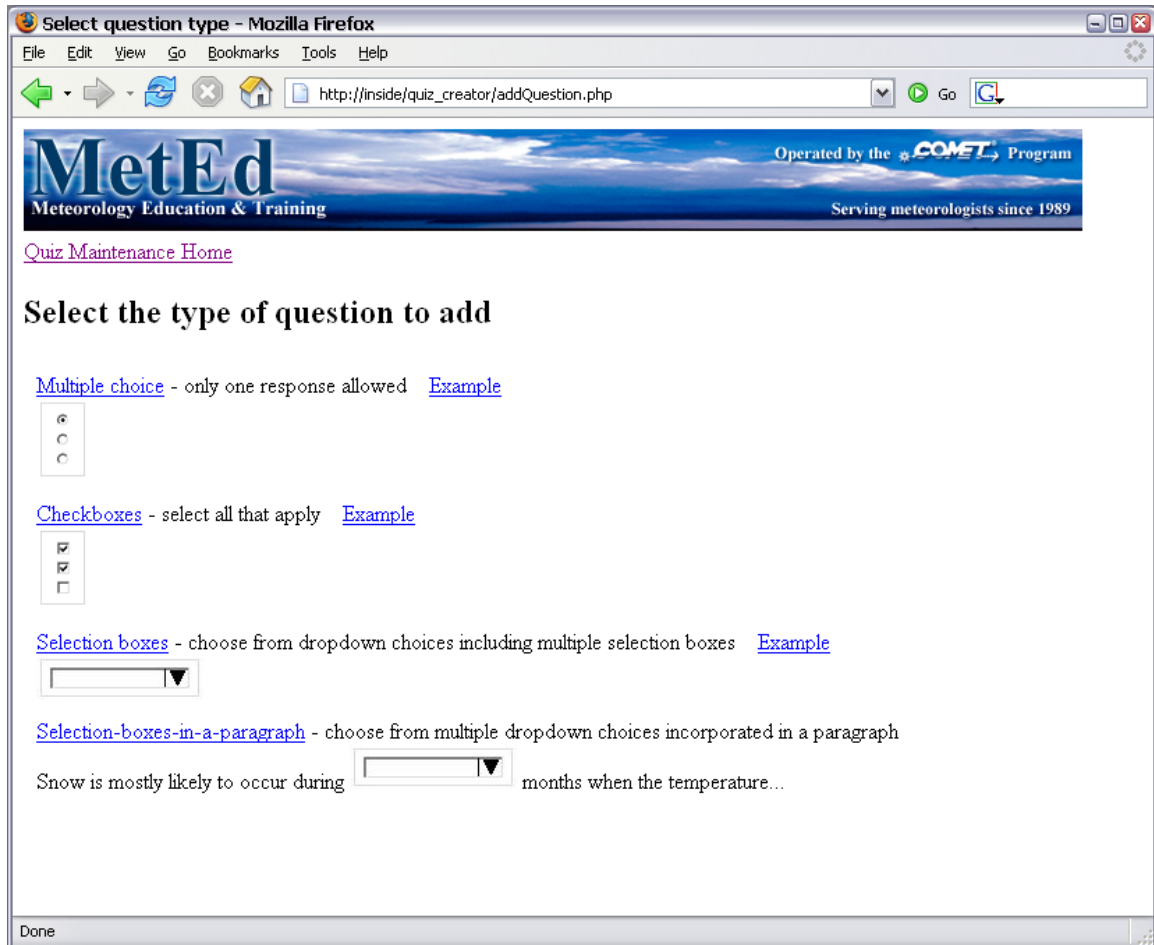
☐ Should the questions be randomized for the user?

Done



## Question Type

There are several types of question that can be created. These include: Multiple-choice with a single answer, multiple-choice with multiple answers, drop-down box at the beginning or end of a sentence, and drop-down boxes throughout a paragraph.



The screenshot shows a web browser window titled "Select question type - Mozilla Firefox". The address bar shows the URL "http://inside/quiz\_creator/addQuestion.php". The page features a banner for "MetEd Meteorology Education & Training" with the text "Operated by the COMET Program" and "Serving meteorologists since 1989". Below the banner is a link "Quiz Maintenance Home". The main heading is "Select the type of question to add". There are four options, each with a description and an "Example" link:

- [Multiple choice](#) - only one response allowed [Example](#)  
☐  
☐  
☐
- [Checkboxes](#) - select all that apply [Example](#)  
☒  
☒  
☐
- [Selection boxes](#) - choose from dropdown choices including multiple selection boxes [Example](#)
- [Selection-boxes-in-a-paragraph](#) - choose from multiple dropdown choices incorporated in a paragraph  
Snow is mostly likely to occur during  months when the temperature...

The status bar at the bottom shows "Done".

## Delete a Question

After a quiz is in the database, questions can be deleted by selecting the desired check box and clicking the submit button.

MetEd Quizzes - Delete Question - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://inside/quiz\_creator/deleteQuestion.php

**MetEd**  
Meteorology Education & Training

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### DLAC Lesson 1a - Fog and Stratus Forecast Approaches Quiz

Please select which questions to delete.

**Question Text**

- ☐ 1. What conditions are favorable for the development and maintenance of both radiation and advection fog events?
- ☐ 2. What conditions set advection fog events apart from radiation fog events? Advection fog events \_\_\_\_\_.
- ☐ 3. Identifying the type of fog processes acting during an event can help determine values for \_\_\_\_\_.
- ☐ 4. Which of the following help precondition the atmosphere for the development of radiation fog?
- ☐ 5. Which local conditions can promote a fog event?
- ☐ 6. Based on the above surface observations from 8 Jan 2002 for the Sacramento, CA airport, what type of fog is occurring?  
Note: Local time is UTC -8 hr.
- ☐ 7. What specific conditions led you to that conclusion?
- ☐ 8. Based on the above sounding and surface observations, what type of fog occurred in Green Bay, WI on 27 February 2004? Note: Local time is UTC -6 hr.
- ☐ 9. What specific conditions led you to that conclusion?
- ☐ 10. What role did the southeast winds play in this event?
- ☐ 11. What role, if any, did radiative cooling play in this event?
- ☐ 12. Examine the soundings above from Gaylord, MI on 15 December 2001. How did the atmosphere change between 0000 UTC and 1200 UTC?

Examine the surface observations from Grand Rapids, MI above. What preconditioned the atmosphere for the fog that

Done

## Question Entry

Questions are entered using simple text-entry fields with prompts.

MetEd Quizzes - Modify an existing checkbox question - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://inside/quiz\_creator/checkboxModify.php?sequenceNumber=1

If a graphic is needed for this question, please supply the path to it on deved:  
web/docs/deved/

Alt text for graphic:

Width Height

0 0

Enter question text:

What conditions are favorable for the development and maintenance of both radiation and advection fog events?

User instructions for answering the question - tags will be formatted as html in quiz

Choose <b>all</b> that apply.

☒ Should these possible answers be presented in random order in the quiz?

Enter possible answer #1:

Subsidence aloft

Enter possible answer #2:

Low-level moisture

Enter possible answer #3:

Strong surface winds

Enter possible answer #4:

Capping inversion

Done

MetEd Quizzes - Modify an existing checkbox question - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://inside/quiz\_creator/checkboxModify.php?sequenceNumber=1

User instructions for answering the question - tags will be formatted as html in quiz  
Choose <b>all</b> that apply.

☒ Should these possible answers be presented in random order in the quiz?

Enter possible answer #1:  
Subsidence aloft

Enter possible answer #2:  
Low-level moisture

Enter possible answer #3:  
Strong surface winds

Enter possible answer #4:  
Capping inversion

Enter possible answer #5:  
Strong convective mixing within the boundary layer

Enter the correct answer ( ex: 1,2,4 )  
1,2,4

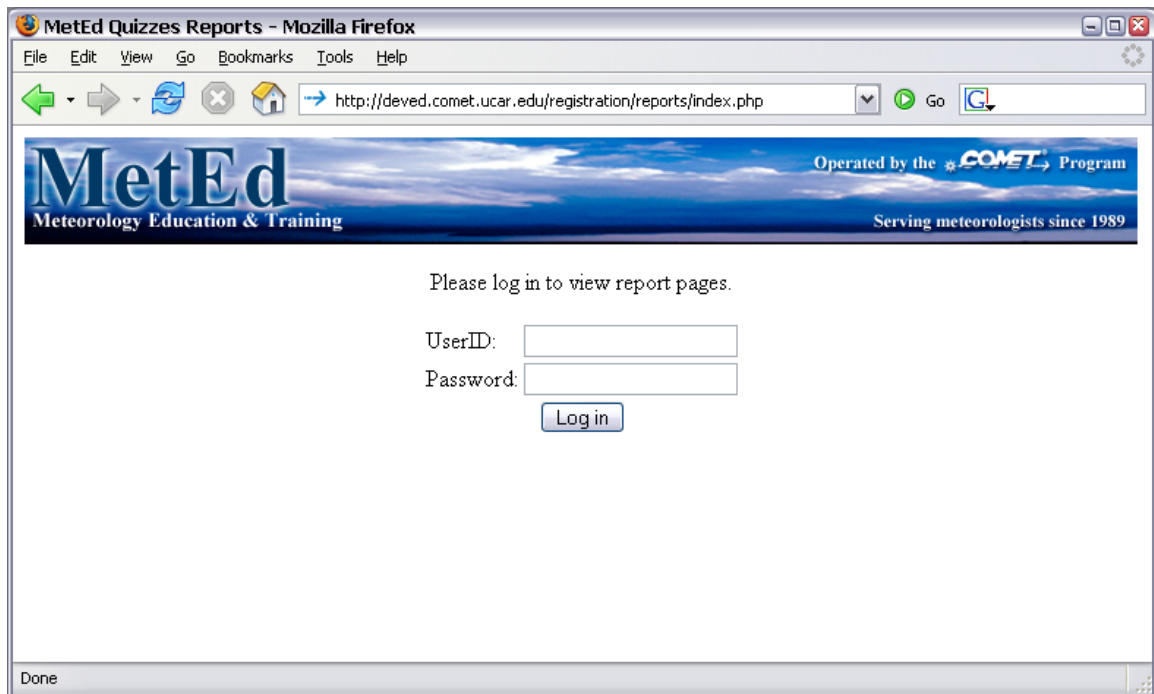
Number of points for this question - usually the same as possible answers  
5

Save Cancel

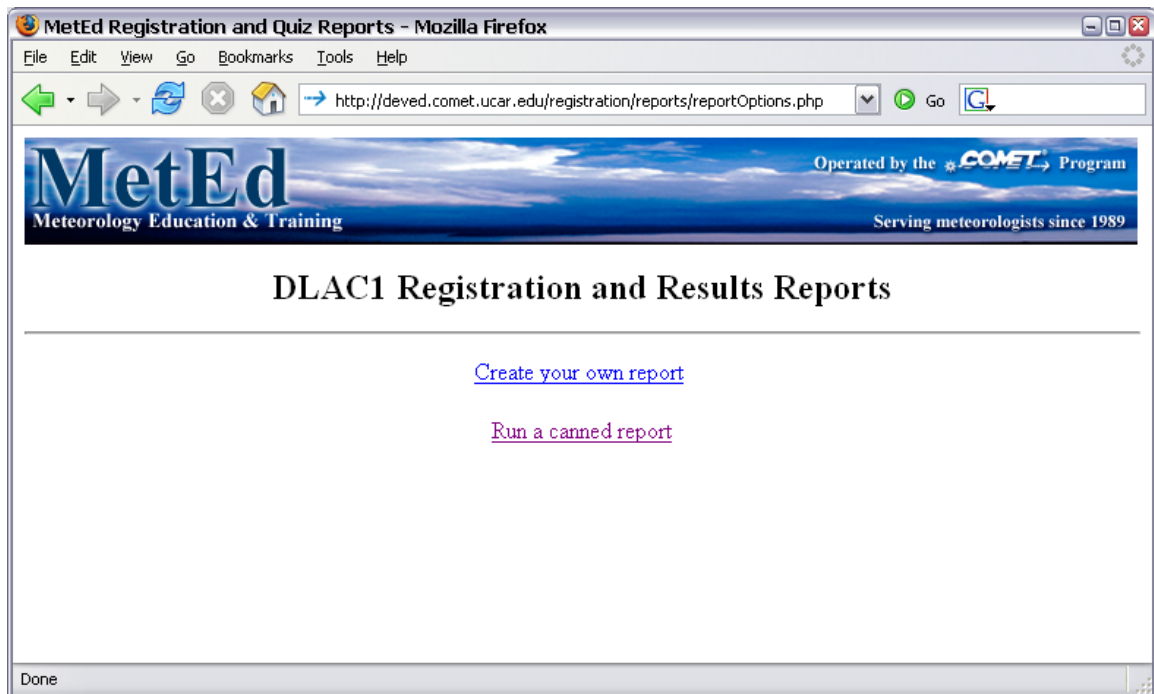
Done

## Reports

Many different reports can be generated with admin privileges.

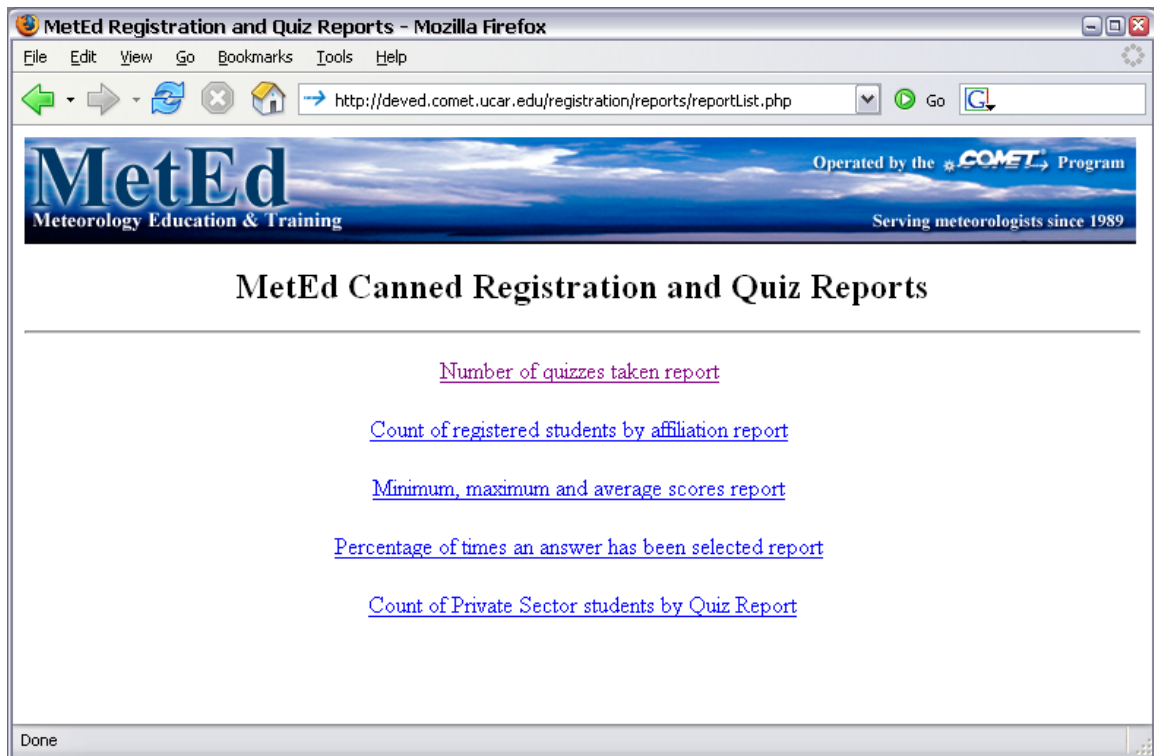


Many reports are canned or custom reports can be created.



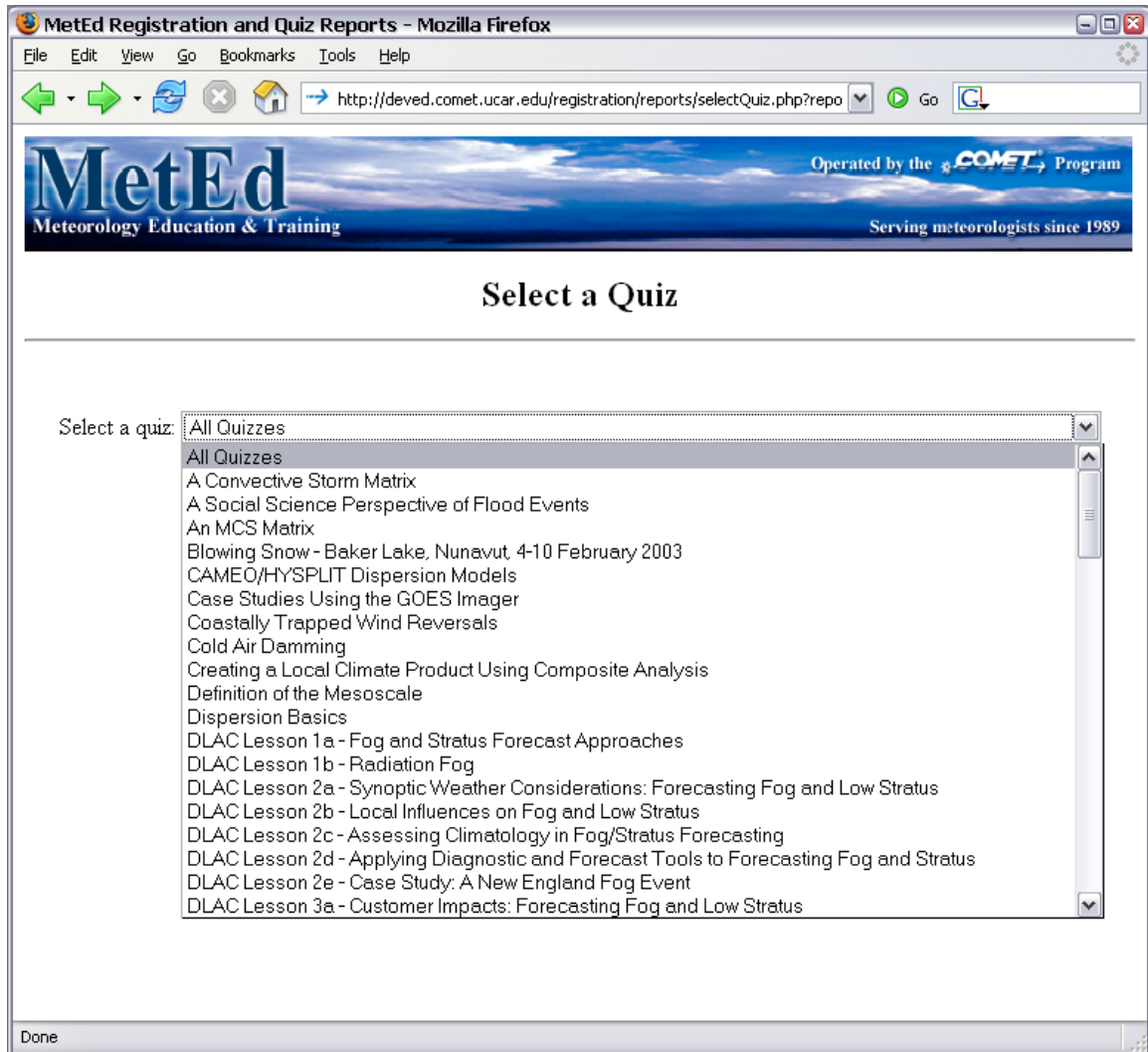
## Canned Reports

Here is a list of the current canned reports.



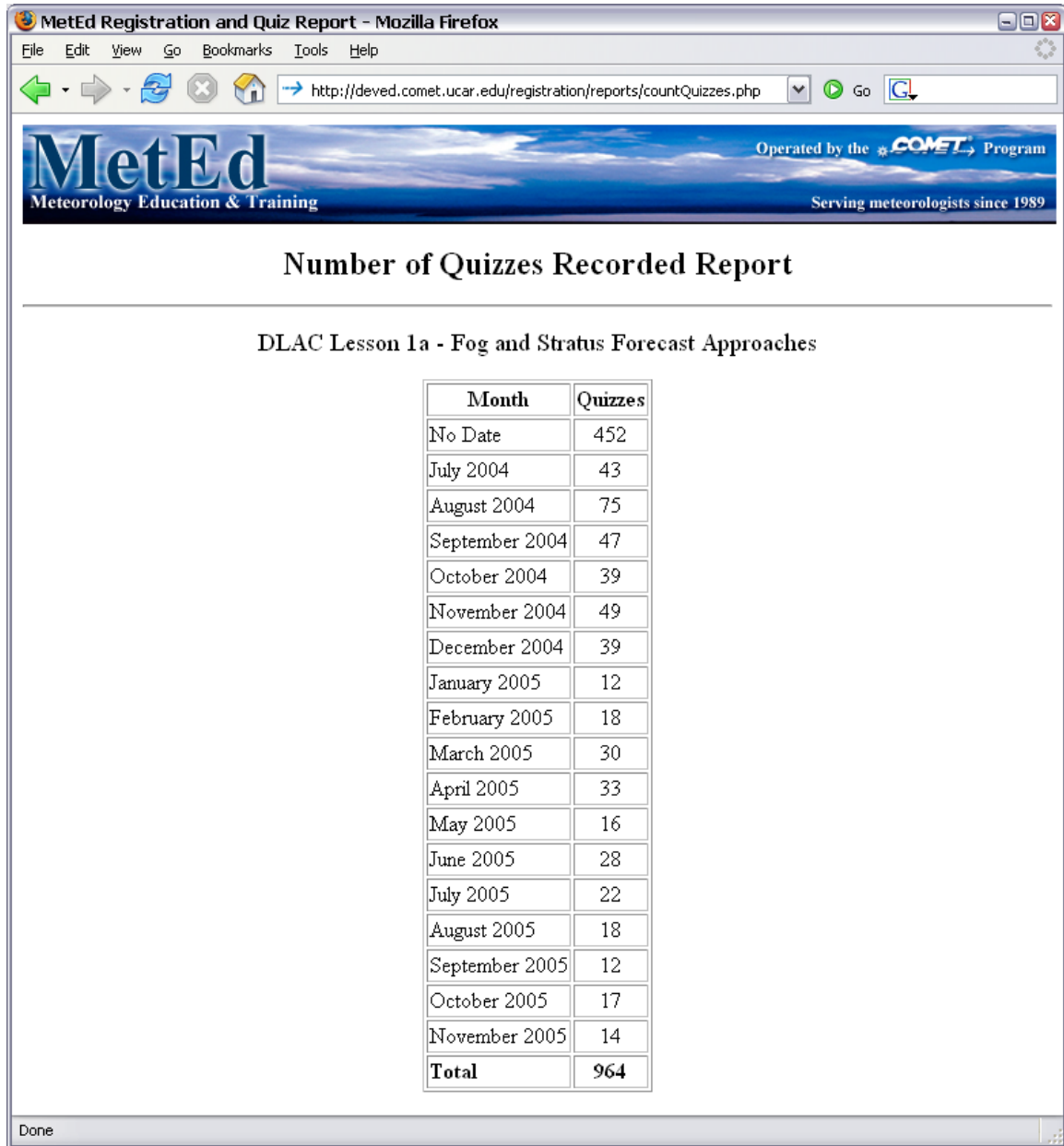
## Number of Quizzes

Once a report type is selected, the admin can choose to search by all or specific leaning module.



## Number of Quizzes Taken Report

This represents a report on the number of quizzes taken each month for the DLAC Lesson 1a.



MetEd Registration and Quiz Report - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://deved.comet.ucar.edu/registration/reports/countQuizzes.php

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### Number of Quizzes Recorded Report

DLAC Lesson 1a - Fog and Stratus Forecast Approaches

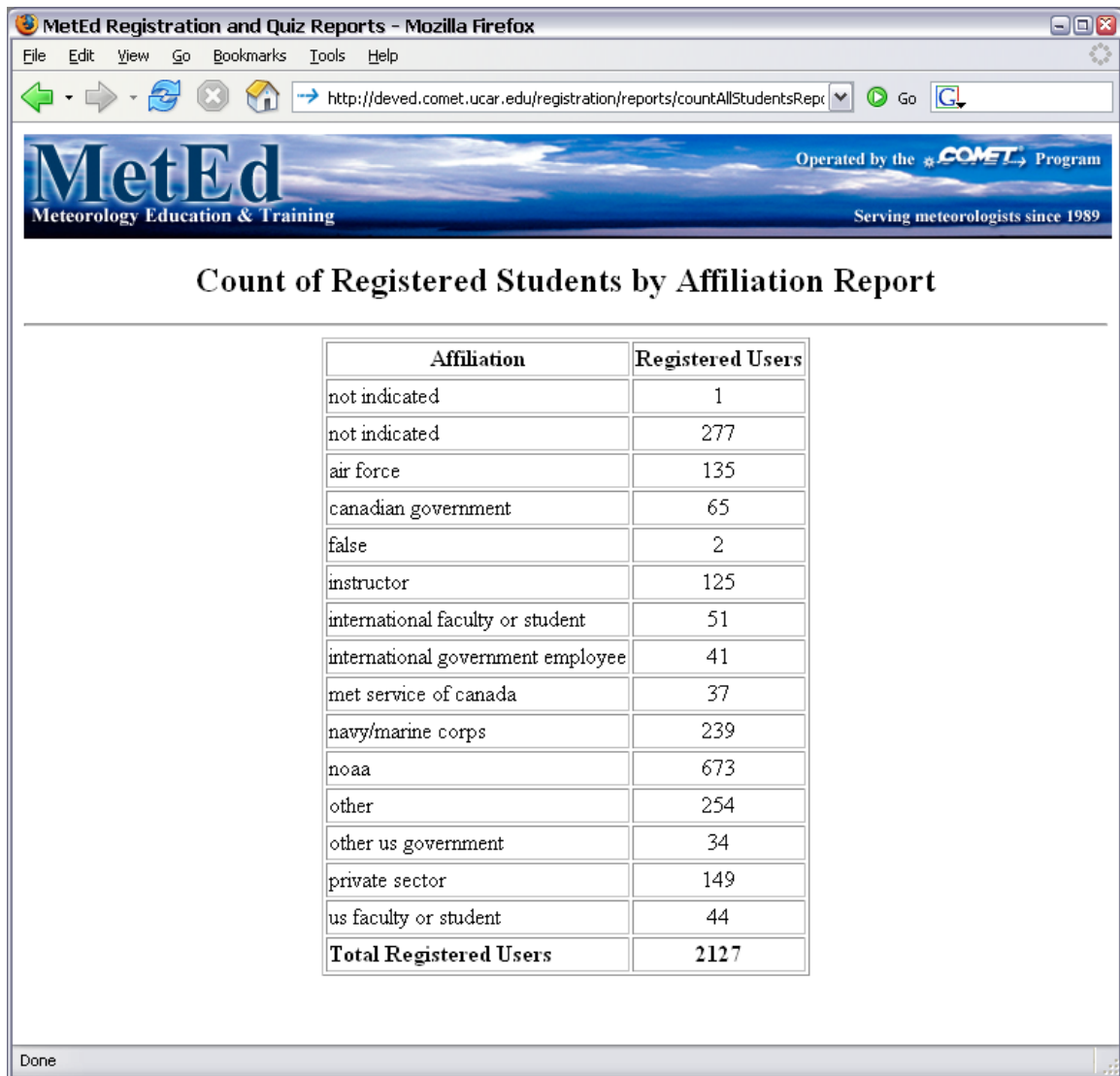
Month	Quizzes
No Date	452
July 2004	43
August 2004	75
September 2004	47
October 2004	39
November 2004	49
December 2004	39
January 2005	12
February 2005	18
March 2005	30
April 2005	33
May 2005	16
June 2005	28
July 2005	22
August 2005	18
September 2005	12
October 2005	17
November 2005	14
<b>Total</b>	<b>964</b>

Done



## Count of Registered Students by Affiliation Report

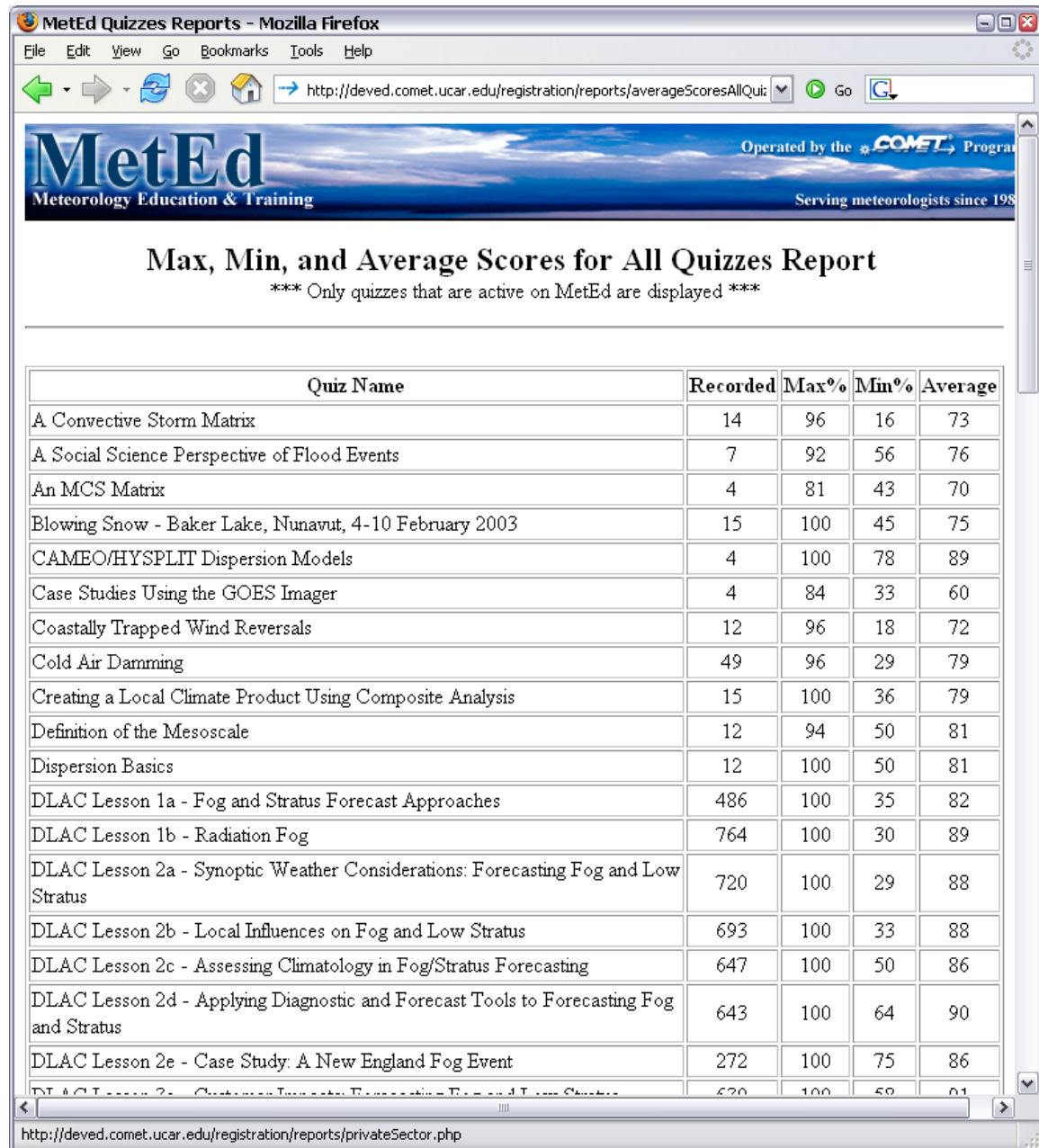
This example report shows the total count of registered users based on affiliation type.



Affiliation	Registered Users
not indicated	1
not indicated	277
air force	135
canadian government	65
false	2
instructor	125
international faculty or student	51
international government employee	41
met service of canada	37
navy/marine corps	239
noaa	673
other	254
other us government	34
private sector	149
us faculty or student	44
<b>Total Registered Users</b>	<b>2127</b>

## Minimum, Maximum and Average Scores Report

This report shows the number of quizzes recorded, the max score, the min score, and the average score.



Quiz Name	Recorded	Max%	Min%	Average
A Convective Storm Matrix	14	96	16	73
A Social Science Perspective of Flood Events	7	92	56	76
An MCS Matrix	4	81	43	70
Blowing Snow - Baker Lake, Nunavut, 4-10 February 2003	15	100	45	75
CAMEO/HYSPLIT Dispersion Models	4	100	78	89
Case Studies Using the GOES Imager	4	84	33	60
Coastally Trapped Wind Reversals	12	96	18	72
Cold Air Damming	49	96	29	79
Creating a Local Climate Product Using Composite Analysis	15	100	36	79
Definition of the Mesoscale	12	94	50	81
Dispersion Basics	12	100	50	81
DLAC Lesson 1a - Fog and Stratus Forecast Approaches	486	100	35	82
DLAC Lesson 1b - Radiation Fog	764	100	30	89
DLAC Lesson 2a - Synoptic Weather Considerations: Forecasting Fog and Low Stratus	720	100	29	88
DLAC Lesson 2b - Local Influences on Fog and Low Stratus	693	100	33	88
DLAC Lesson 2c - Assessing Climatology in Fog/Stratus Forecasting	647	100	50	86
DLAC Lesson 2d - Applying Diagnostic and Forecast Tools to Forecasting Fog and Stratus	643	100	64	90
DLAC Lesson 2e - Case Study: A New England Fog Event	272	100	75	86
DLAC Lesson 2f - Customized Imager Forecasting Fog and Low Stratus	630	100	50	81

## Percentage of Times an Answer Has Been Selected Report

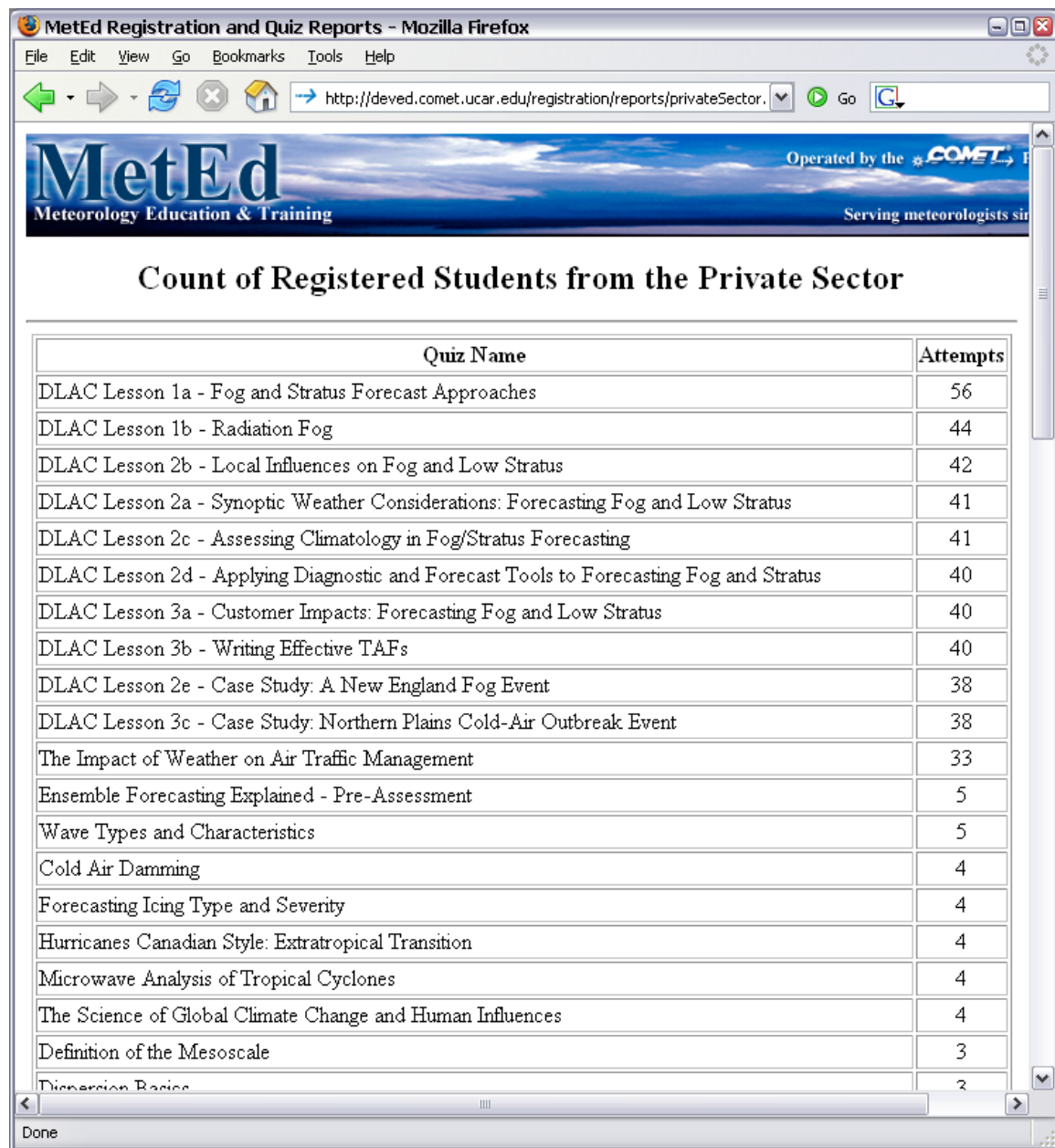
The report shows the percentage of time a user selected each answer. The correct answers are shown in bold. This report allows UCAR-COMET to see which questions everyone is getting correct and which are being missed.

The screenshot shows a Mozilla Firefox browser window with the title 'MetEd Registration and Quiz Reports - Mozilla Firefox'. The address bar displays the URL 'http://deved.comet.ucar.edu/registration/reports/quizPercentag'. The page features a banner for 'MetEd Meteorology Education & Training' with the text 'Operated by the COMET Program' and 'Serving meteorologists since 1989'. The main heading is 'A Social Science Perspective of Flood Events', followed by the instruction 'Correct answers appear in bold'. Below this, it states 'Number of completed quizzes considered for the report: 7'. The report contains three questions with their respective answer options and percentages. Correct answers are highlighted in bold.

Question	Options	Correct Answer
1. Prior to the Big Thompson flood event, most government policy on flooding was based on _____ flooding and not _____ flooding events.	0% - main stem river   slow-rise 0% - flash   main stem river <b>71% - slow-rise   flash</b> 14% - flash   slow-rise 14% - small stream   main stem river	slow-rise   flash
2. Social science studies on flash flooding have found which of the following about warnings?	0% - People generally respond immediately. <b>100% - People have to assess their own risk before responding.</b> <b>71% - Warnings are not a stimulus response action.</b> 57% - Warnings do not increase the likelihood of a response. 29% - Warnings are typically viewed by the public as a "cry wolf" or overstated product.	People have to assess their own risk before responding. Warnings are not a stimulus response action.
3. For a warning to provoke a desired and positive response by the public, the product should take into account which of the following?	<b>86% - Social considerations</b> <b>57% - Scientific components</b> <b>86% - Detection and response</b>	Social considerations Scientific components Detection and response

## Count of Private Sector Students by Quiz Report

This report shows the number of times a quiz was taken by someone in the private sector.



**Count of Registered Students from the Private Sector**

Quiz Name	Attempts
DLAC Lesson 1a - Fog and Stratus Forecast Approaches	56
DLAC Lesson 1b - Radiation Fog	44
DLAC Lesson 2b - Local Influences on Fog and Low Stratus	42
DLAC Lesson 2a - Synoptic Weather Considerations: Forecasting Fog and Low Stratus	41
DLAC Lesson 2c - Assessing Climatology in Fog/Stratus Forecasting	41
DLAC Lesson 2d - Applying Diagnostic and Forecast Tools to Forecasting Fog and Stratus	40
DLAC Lesson 3a - Customer Impacts: Forecasting Fog and Low Stratus	40
DLAC Lesson 3b - Writing Effective TAFs	40
DLAC Lesson 2e - Case Study: A New England Fog Event	38
DLAC Lesson 3c - Case Study: Northern Plains Cold-Air Outbreak Event	38
The Impact of Weather on Air Traffic Management	33
Ensemble Forecasting Explained - Pre-Assessment	5
Wave Types and Characteristics	5
Cold Air Damming	4
Forecasting Icing Type and Severity	4
Hurricanes Canadian Style: Extratropical Transition	4
Microwave Analysis of Tropical Cyclones	4
The Science of Global Climate Change and Human Influences	4
Definition of the Mesoscale	3
Dispersion Basics	2

## Create Your Own Report

This is the screen where a custom report can be created. All search criteria are available and can be selected as desired.

MetEd Registration and Quiz Reports - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://deved.comet.ucar.edu/registration/reports/queryForm.php

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**Enter the criteria to search by in the records**  
(Any or all of the fields may be filled in)

Quiz name:

E-mail:

First name:

Last name:

Affiliation:

Supervisor Email:

City:

State:

Country:

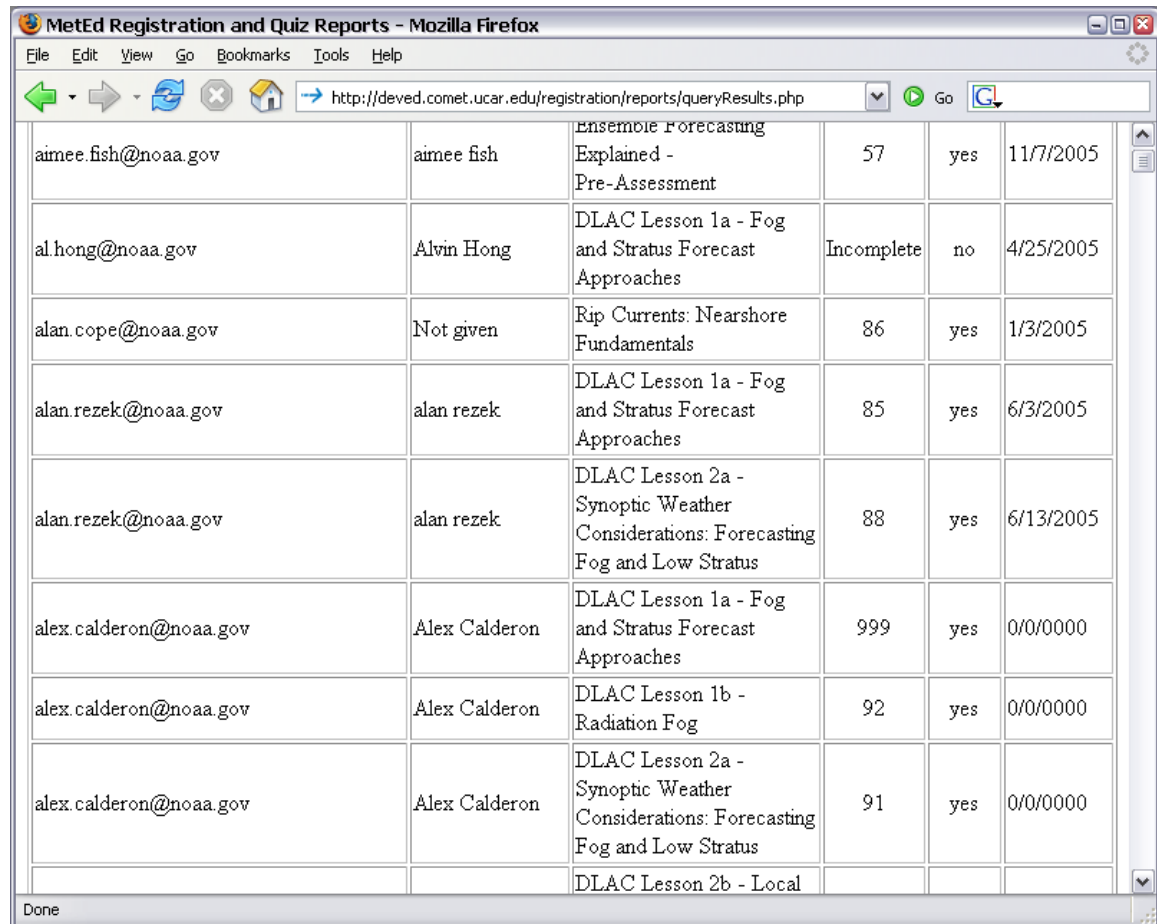
Month:

Year:

Done

### Example Results for Search by Division NOAA

From the screen above, the report shows all data in the system with a noaa.gov email address.



MetEd Registration and Quiz Reports - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

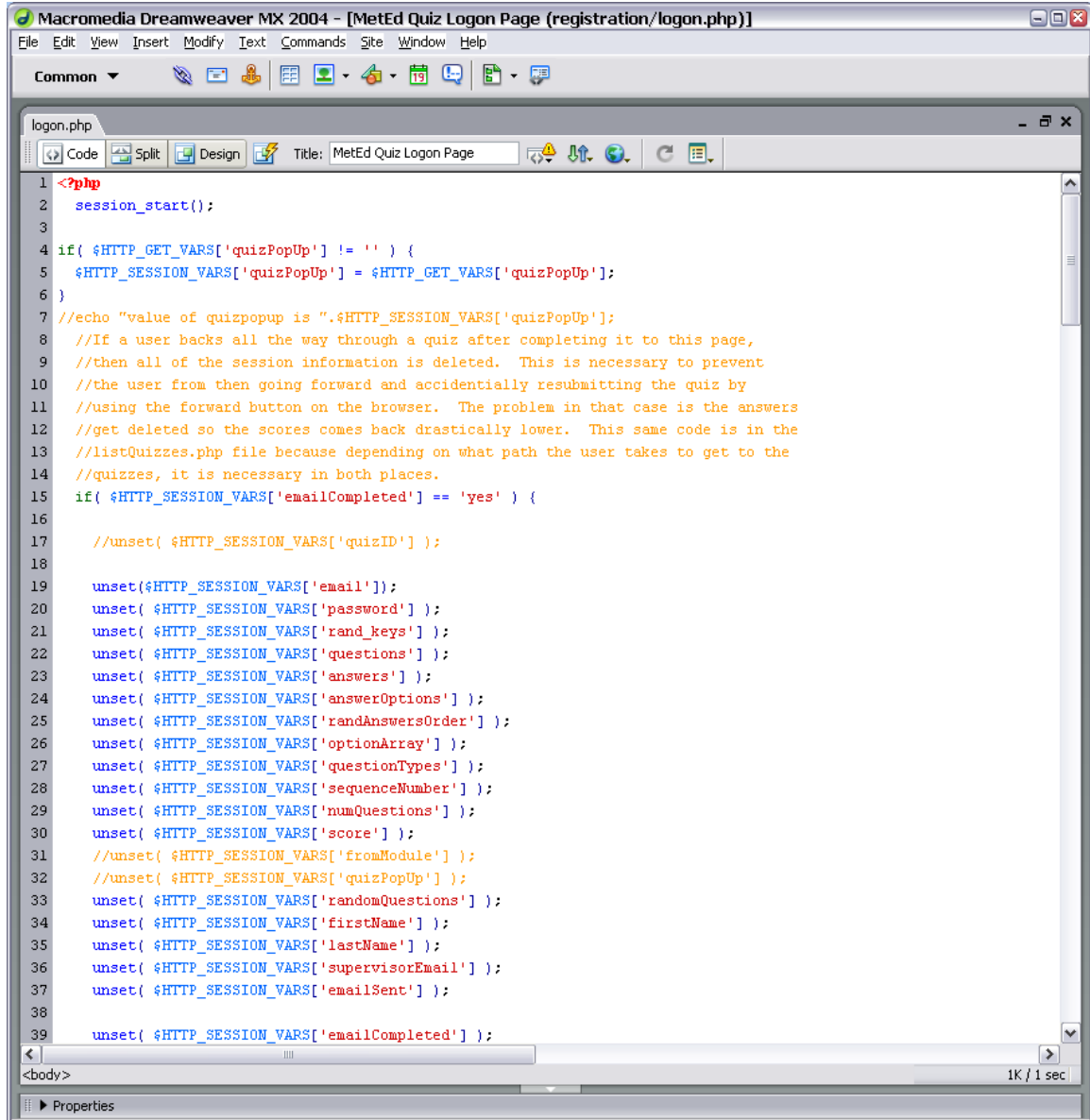
http://deved.comet.ucar.edu/registration/reports/queryResults.php

aim.ee.fish@noaa.gov	aim.ee.fish	Ensemble Forecasting Explained - Pre-Assessment	57	yes	11/7/2005
al.hong@noaa.gov	Alvin Hong	DLAC Lesson 1a - Fog and Stratus Forecast Approaches	Incomplete	no	4/25/2005
alan.cope@noaa.gov	Not given	Rip Currents: Nearshore Fundamentals	86	yes	1/3/2005
alan.rezek@noaa.gov	alan rezek	DLAC Lesson 1a - Fog and Stratus Forecast Approaches	85	yes	6/3/2005
alan.rezek@noaa.gov	alan rezek	DLAC Lesson 2a - Synoptic Weather Considerations: Forecasting Fog and Low Stratus	88	yes	6/13/2005
alex.calderon@noaa.gov	Alex Calderon	DLAC Lesson 1a - Fog and Stratus Forecast Approaches	999	yes	0/0/0000
alex.calderon@noaa.gov	Alex Calderon	DLAC Lesson 1b - Radiation Fog	92	yes	0/0/0000
alex.calderon@noaa.gov	Alex Calderon	DLAC Lesson 2a - Synoptic Weather Considerations: Forecasting Fog and Low Stratus	91	yes	0/0/0000
		DLAC Lesson 2b - Local			

Done

## **Appendix C: Sample php Code**

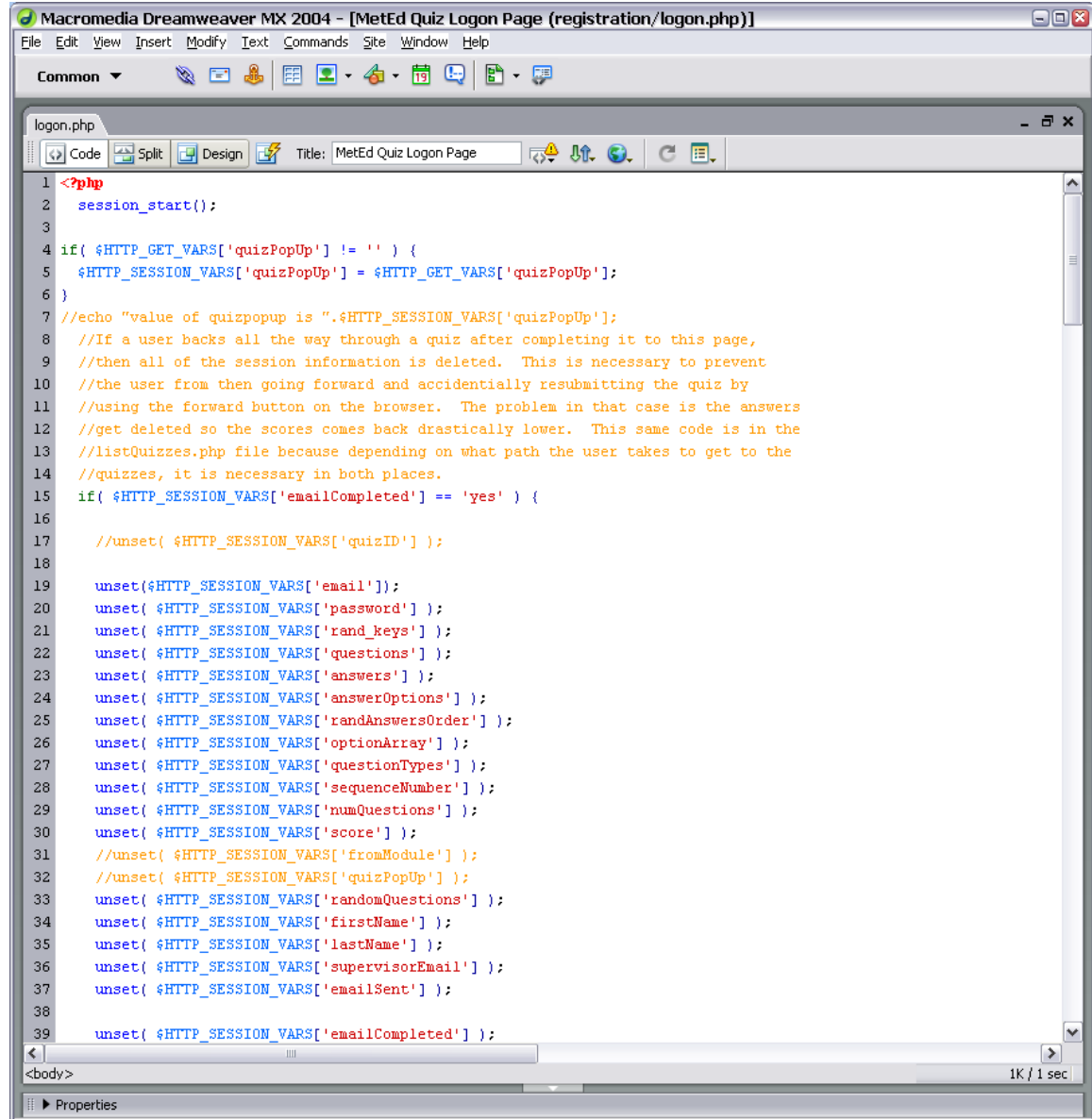
## Login Page



```
1 <?php
2 session_start();
3
4 if( $HTTP_GET_VARS['quizPopUp'] != '' ) {
5     $HTTP_SESSION_VARS['quizPopUp'] = $HTTP_GET_VARS['quizPopUp'];
6 }
7 //echo "value of quizpopup is ".$HTTP_SESSION_VARS['quizPopUp'];
8 //If a user backs all the way through a quiz after completing it to this page,
9 //then all of the session information is deleted. This is necessary to prevent
10 //the user from then going forward and accidentally resubmitting the quiz by
11 //using the forward button on the browser. The problem in that case is the answers
12 //get deleted so the scores comes back drastically lower. This same code is in the
13 //listQuizzes.php file because depending on what path the user takes to get to the
14 //quizzes, it is necessary in both places.
15 if( $HTTP_SESSION_VARS['emailCompleted'] == 'yes' ) {
16
17     //unset( $HTTP_SESSION_VARS['quizID'] );
18
19     unset($HTTP_SESSION_VARS['email']);
20     unset( $HTTP_SESSION_VARS['password'] );
21     unset( $HTTP_SESSION_VARS['rand_keys'] );
22     unset( $HTTP_SESSION_VARS['questions'] );
23     unset( $HTTP_SESSION_VARS['answers'] );
24     unset( $HTTP_SESSION_VARS['answerOptions'] );
25     unset( $HTTP_SESSION_VARS['randAnswersOrder'] );
26     unset( $HTTP_SESSION_VARS['optionArray'] );
27     unset( $HTTP_SESSION_VARS['questionTypes'] );
28     unset( $HTTP_SESSION_VARS['sequenceNumber'] );
29     unset( $HTTP_SESSION_VARS['numQuestions'] );
30     unset( $HTTP_SESSION_VARS['score'] );
31     //unset( $HTTP_SESSION_VARS['fromModule'] );
32     //unset( $HTTP_SESSION_VARS['quizPopUp'] );
33     unset( $HTTP_SESSION_VARS['randomQuestions'] );
34     unset( $HTTP_SESSION_VARS['firstName'] );
35     unset( $HTTP_SESSION_VARS['lastName'] );
36     unset( $HTTP_SESSION_VARS['supervisorEmail'] );
37     unset( $HTTP_SESSION_VARS['emailSent'] );
38
39     unset( $HTTP_SESSION_VARS['emailCompleted'] );
40 }
41
42 <body>
```



## Checkbox Question Template Page



Macromedia Dreamweaver MX 2004 - [MetEd Quiz Logon Page (registration/logon.php)]

File Edit View Insert Modify Text Commands Site Window Help

Common

logon.php

Code Split Design Title: MetEd Quiz Logon Page

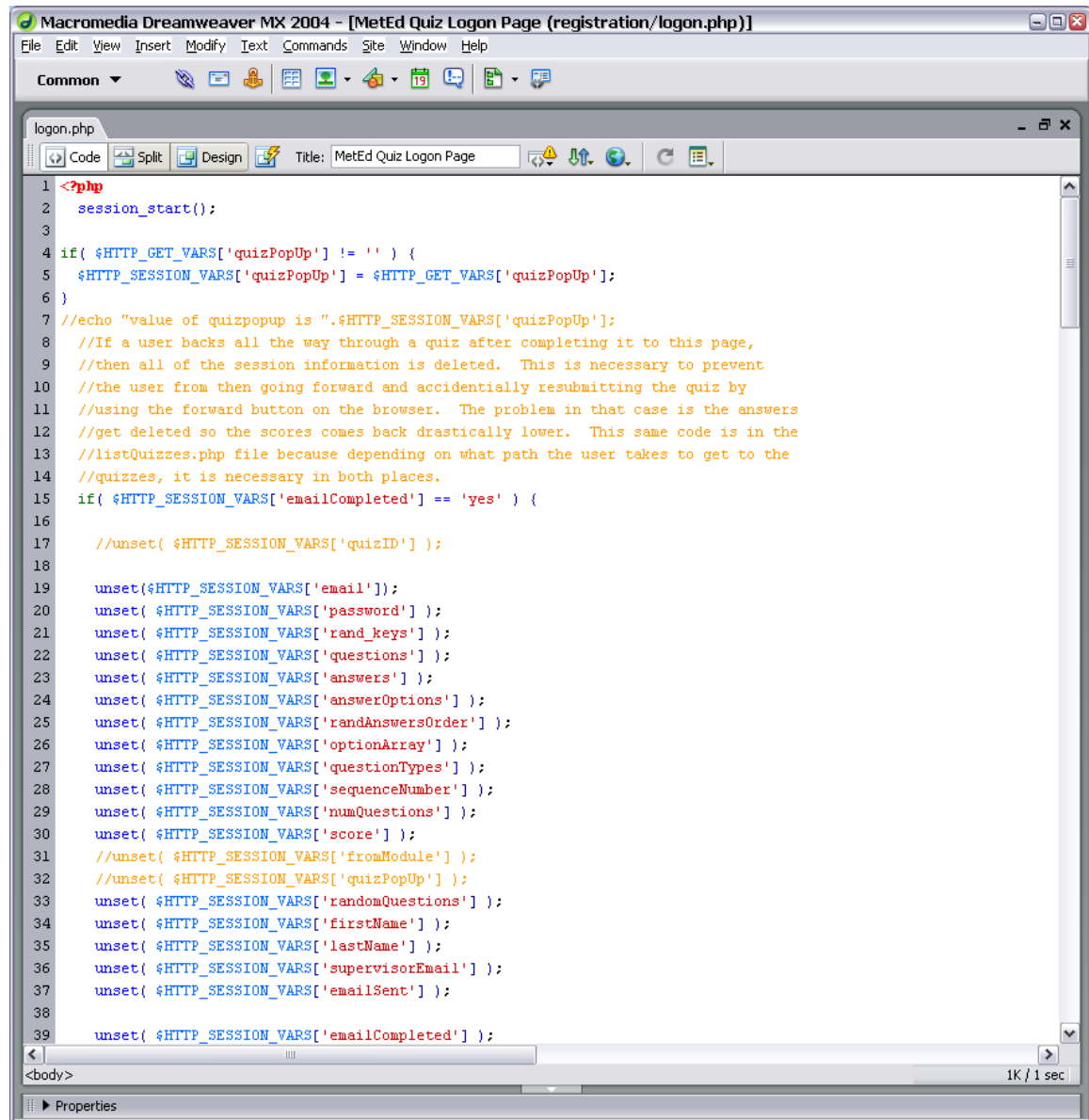
```
1 <?php
2 session_start();
3
4 if( $HTTP_GET_VARS['quizPopUp'] != '' ) {
5     $HTTP_SESSION_VARS['quizPopUp'] = $HTTP_GET_VARS['quizPopUp'];
6 }
7 //echo "value of quizpopup is ".$HTTP_SESSION_VARS['quizPopUp'];
8 //If a user backs all the way through a quiz after completing it to this page,
9 //then all of the session information is deleted. This is necessary to prevent
10 //the user from then going forward and accidentally resubmitting the quiz by
11 //using the forward button on the browser. The problem in that case is the answers
12 //get deleted so the scores comes back drastically lower. This same code is in the
13 //listQuizzes.php file because depending on what path the user takes to get to the
14 //quizzes, it is necessary in both places.
15 if( $HTTP_SESSION_VARS['emailCompleted'] == 'yes' ) {
16
17     //unset( $HTTP_SESSION_VARS['quizID'] );
18
19     unset($HTTP_SESSION_VARS['email']);
20     unset( $HTTP_SESSION_VARS['password'] );
21     unset( $HTTP_SESSION_VARS['rand_keys'] );
22     unset( $HTTP_SESSION_VARS['questions'] );
23     unset( $HTTP_SESSION_VARS['answers'] );
24     unset( $HTTP_SESSION_VARS['answerOptions'] );
25     unset( $HTTP_SESSION_VARS['randAnswersOrder'] );
26     unset( $HTTP_SESSION_VARS['optionArray'] );
27     unset( $HTTP_SESSION_VARS['questionTypes'] );
28     unset( $HTTP_SESSION_VARS['sequenceNumber'] );
29     unset( $HTTP_SESSION_VARS['numQuestions'] );
30     unset( $HTTP_SESSION_VARS['score'] );
31     //unset( $HTTP_SESSION_VARS['fromModule'] );
32     //unset( $HTTP_SESSION_VARS['quizPopUp'] );
33     unset( $HTTP_SESSION_VARS['randomQuestions'] );
34     unset( $HTTP_SESSION_VARS['firstName'] );
35     unset( $HTTP_SESSION_VARS['lastName'] );
36     unset( $HTTP_SESSION_VARS['supervisorEmail'] );
37     unset( $HTTP_SESSION_VARS['emailSent'] );
38
39     unset( $HTTP_SESSION_VARS['emailCompleted'] );
40 }
```

<body>

1K / 1 sec

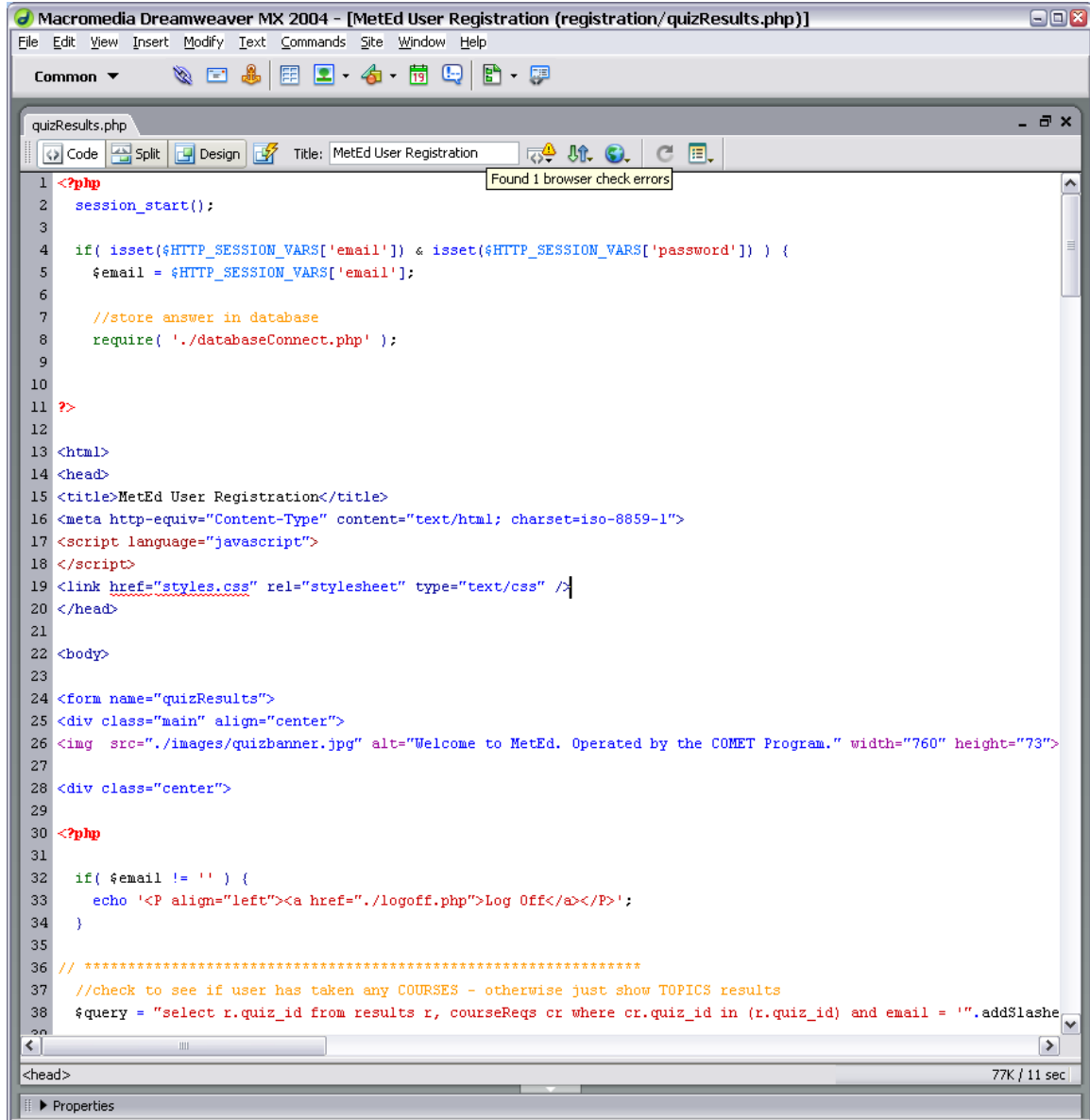
Properties

## User Account Page



```
1 <?php
2 session_start();
3
4 if( $HTTP_GET_VARS['quizPopUp'] != '' ) {
5     $HTTP_SESSION_VARS['quizPopUp'] = $HTTP_GET_VARS['quizPopUp'];
6 }
7 //echo "value of quizpopup is ".$HTTP_SESSION_VARS['quizPopUp'];
8 //If a user backs all the way through a quiz after completing it to this page,
9 //then all of the session information is deleted. This is necessary to prevent
10 //the user from then going forward and accidentally resubmitting the quiz by
11 //using the forward button on the browser. The problem in that case is the answers
12 //get deleted so the scores comes back drastically lower. This same code is in the
13 //listQuizzes.php file because depending on what path the user takes to get to the
14 //quizzes, it is necessary in both places.
15 if( $HTTP_SESSION_VARS['emailCompleted'] == 'yes' ) {
16
17     //unset( $HTTP_SESSION_VARS['quizID'] );
18
19     unset($HTTP_SESSION_VARS['email']);
20     unset( $HTTP_SESSION_VARS['password'] );
21     unset( $HTTP_SESSION_VARS['rand_keys'] );
22     unset( $HTTP_SESSION_VARS['questions'] );
23     unset( $HTTP_SESSION_VARS['answers'] );
24     unset( $HTTP_SESSION_VARS['answerOptions'] );
25     unset( $HTTP_SESSION_VARS['randAnswersOrder'] );
26     unset( $HTTP_SESSION_VARS['optionArray'] );
27     unset( $HTTP_SESSION_VARS['questionTypes'] );
28     unset( $HTTP_SESSION_VARS['sequenceNumber'] );
29     unset( $HTTP_SESSION_VARS['numQuestions'] );
30     unset( $HTTP_SESSION_VARS['score'] );
31     //unset( $HTTP_SESSION_VARS['fromModule'] );
32     //unset( $HTTP_SESSION_VARS['quizPopUp'] );
33     unset( $HTTP_SESSION_VARS['randomQuestions'] );
34     unset( $HTTP_SESSION_VARS['firstName'] );
35     unset( $HTTP_SESSION_VARS['lastName'] );
36     unset( $HTTP_SESSION_VARS['supervisorEmail'] );
37     unset( $HTTP_SESSION_VARS['emailSent'] );
38
39     unset( $HTTP_SESSION_VARS['emailCompleted'] );
40
41 }
42
43 </body>
```

## Quiz Results Page



Macromedia Dreamweaver MX 2004 - [MetEd User Registration (registration/quizResults.php)]

File Edit View Insert Modify Text Commands Site Window Help

Common

quizResults.php

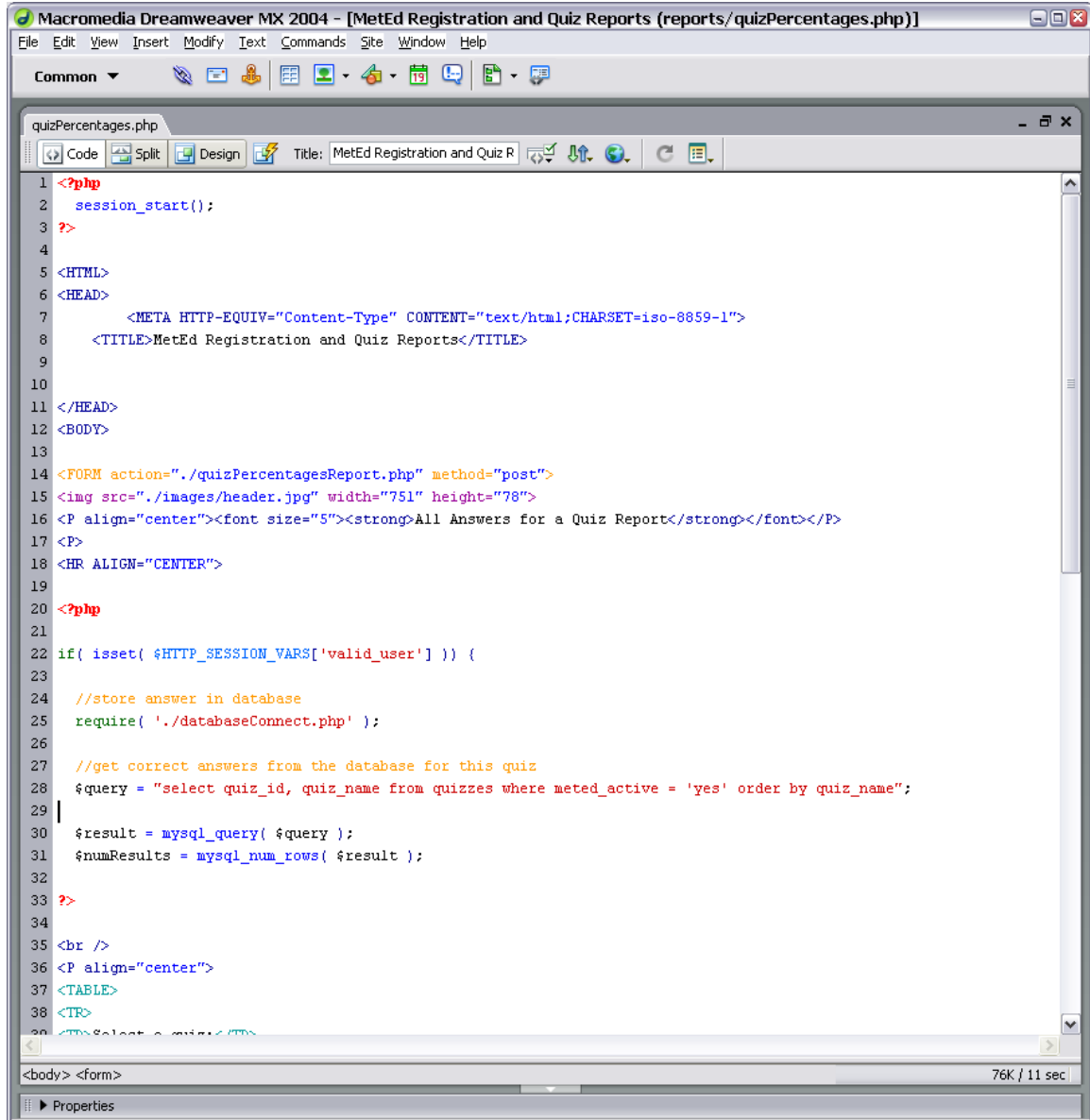
Code Split Design Title: MetEd User Registration Found 1 browser check errors

```
1 <?php
2 session_start();
3
4 if( isset($_HTTP_SESSION_VARS['email']) & isset($_HTTP_SESSION_VARS['password']) ) {
5     $email = $_HTTP_SESSION_VARS['email'];
6
7     //store answer in database
8     require( './databaseConnect.php' );
9
10
11 ?>
12
13 <html>
14 <head>
15 <title>MetEd User Registration</title>
16 <meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1">
17 <script language="javascript">
18 </script>
19 <link href="styles.css" rel="stylesheet" type="text/css" />
20 </head>
21
22 <body>
23
24 <form name="quizResults">
25 <div class="main" align="center">
26 
27
28 <div class="center">
29
30 <?php
31
32 if( $email != '' ) {
33     echo '<P align="left"><a href="./logoff.php">Log Off</a></P>';
34 }
35
36 // *****
37 //check to see if user has taken any COURSES - otherwise just show TOPICS results
38 $query = "select r.quiz_id from results r, courseReqs cr where cr.quiz_id in (r.quiz_id) and email = '".addSlashe
```

<head> 77K / 11 sec

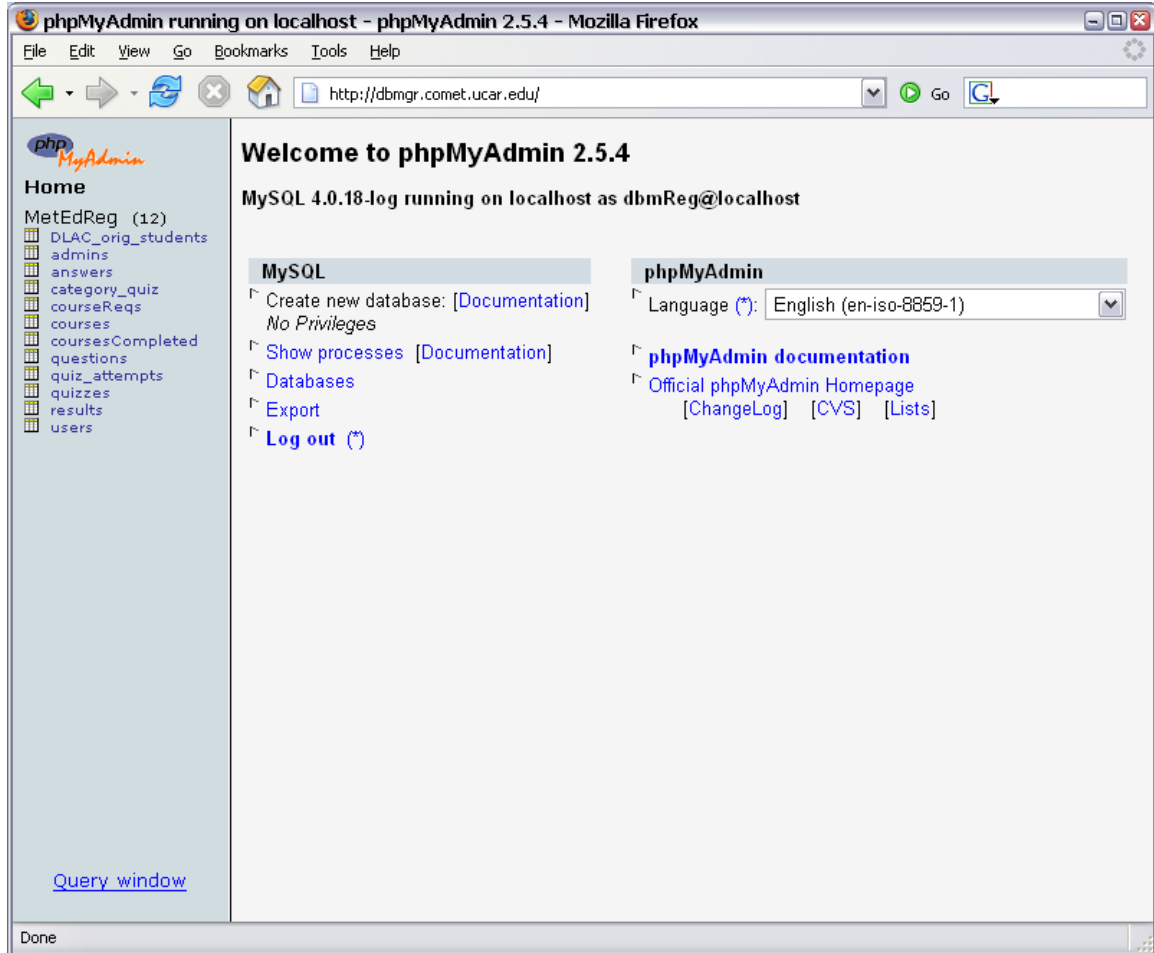
Properties

### Reports Quiz Percentage



## **Appendix D: The Database Structure**

## Database Entry Point



## Admin Table

MetEdReg.admins running on localhost - phpMyAdmin 2.5.4 - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://dbmgr.comet.ucar.edu/

phpMyAdmin

Home

MetEdReg (12)

- DLAC\_orig\_students
- admins
- answers
- category\_quiz
- courseReqs
- courses
- coursesCompleted
- questions
- quiz\_attempts
- quizzes
- results
- users

### Database MetEdReg - Table admins running on localhost

Structure Browse SQL Search Insert Export Operations Empty Drop

Field	Type	Attributes	Null	Default	Extra	Action
<input type="checkbox"/> user_id	varchar(15)		No			
<input type="checkbox"/> password	varchar(10)		No			

Check All / Uncheck All With selected:

Indexes : [Documentation]

No index defined!

Create an index on  columns

Space usage :

Type	Usage
Data	140 Bytes
Index	1,024 Bytes
Total	1,164 Bytes

Row Statistic :

Statements	Value
Format	dynamic
Rows	7
Row length	20
Row size	166 Bytes
Creation	Aug 09, 2004 at 03:25 PM
Last update	Nov 21, 2005 at 02:04 PM

- Print view
- Add new field :  At End of Table
- Propose table structure [Documentation]

Run SQL query/queries on database MetEdReg [Documentation]

SELECT \* FROM `admins` WHERE 1

Fields:

user\_id  
password

☒ Show this query here again

Or Location of the textfile :

Compression: ☒ Autodetect ☐ None ☐ "gzipped" ☐ "bzipped"

[Query window](#)

Done

## Quiz Answers Table

MetEdReg.answers running on localhost - phpMyAdmin 2.5.4 - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://dbmgr.comet.ucar.edu/

phpMyAdmin

















































Home



MetEdReg (12)

- DLAC\_orig\_students
- admins
- answers
- category\_quiz
- courseReqs
- coursesCompleted
- questions
- quiz\_attempts
- quizzes
- results
- users



### Database MetEdReg - Table answers running on localhost

Structure Browse SQL Search Insert Export Operations Empty Drop

Field	Type	Attributes	Null	Default	Extra	Action
<input type="checkbox"/> question_id	int(11)		No		auto_increment	     
<input type="checkbox"/> quiz_id	int(11)		No	0		     
<input type="checkbox"/> sequence_num	int(11)		No	0		     
<input type="checkbox"/> sub_sequence_num	tinyint(4)		No	0		     
<input type="checkbox"/> select_num	int(11)		No	0		     
<input type="checkbox"/> select_text	mediumtext		No			     
<input type="checkbox"/> answer	text		No			     
<input type="checkbox"/> date_changed	timestamp(14)		Yes	NULL		     

Check All / Uncheck All With selected:  

Indexes : [\[Documentation\]](#)

Keyname	Type	Cardinality	Action	Field	Type	Usage
PRIMARY	PRIMARY	6882	 	question_id	Data	991,856 Bytes
					Index	70,656 Bytes
					Total	1,038 KB

Space usage :

Row Statistic :

Statements	Value
Format	dynamic
Rows	6,882
Row length ø	144
Row size ø	154 Bytes
Next Autoindex	15,650
Creation	Nov 03, 2005 at 11:41 AM
Last update	Nov 30, 2005 at 10:08 AM

Create an index on  columns

- [Print view](#)
- Add new field :  At End of Table
- [Propose table structure \[Documentation\]](#)

Run SQL query/queries on database MetEdReg [\[Documentation\]](#)

SELECT \* FROM `answers` WHERE 1

Fields:

- question\_id
- quiz\_id
- sequence\_num
- sub\_sequence\_num

Query window

Done



## Quiz Category Table

MetEdReg.category\_quiz running on localhost - phpMyAdmin 2.5.4 - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://dbmgr.comet.ucar.edu/

phpMyAdmin

Home

MetEdReg (12)

- DLAC\_orig\_students
- admins
- answers
- category\_quiz
- courseReqs
- courses
- coursesCompleted
- questions
- quiz\_attempts
- quizzes
- results
- users

### Database MetEdReg - Table category\_quiz running on localhost

Structure Browse SQL Search Insert Export Operations Empty Drop

Field	Type	Attributes	Null	Default	Extra	Action
<input type="checkbox"/> category_name	varchar(100)		No			
<input type="checkbox"/> quiz_id	smallint(6)		No	0		

Check All / Uncheck All With selected:

Indexes : [Documentation]

No index defined!

Create an index on  columns

Space usage :

Type	Usage
Data	3,868 Bytes
Index	1,024 Bytes
Total	4,892 Bytes

Row Statistic :

Statements	Value
Format	dynamic
Rows	125
Row length	30
Row size	39 Bytes
Creation	Jan 20, 2005 at 03:11 PM
Last update	Nov 30, 2005 at 10:08 AM

- Print view
- Add new field :  At End of Table
- Propose table structure [Documentation]

Run SQL query/queries on database MetEdReg [Documentation]

SELECT \* FROM `category\_quiz` WHERE 1

Fields:

- category\_name
- quiz\_id

☒ Show this query here again

Or Location of the textfile :

Compression: ☒ Autodetect ☐ None ☐ "gzipped" ☐ "bzipped"

Query window

Done

## Course Registration Table

MetEdReg.courseReqs running on localhost - phpMyAdmin 2.5.4 - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://dbmgr.comet.ucar.edu/

phpMyAdmin

Home

MetEdReg (12)

- DLAC\_orig\_students
- admins
- answers
- category\_quiz
- courseReqs
- courses
- coursesCompleted
- questions
- quiz\_attempts
- quizzes
- results
- users

### Database MetEdReg - Table courseReqs running on localhost

Structure Browse SQL Search Insert Export Operations Empty Drop

Field	Type	Attributes	Null	Default	Extra	Action
<input type="checkbox"/> course_id	int(11)		No	0		
<input type="checkbox"/> quiz_id	int(11)		No	0		
<input type="checkbox"/> quiz_name	varchar(100)		No			

Check All / Uncheck All With selected:

Indexes : [\[Documentation\]](#)

Keyname	Type	Cardinality	Action	Field
PRIMARY	PRIMARY	88		course_id quiz_id

Create an index on  columns

Space usage :

Type	Usage
Data	5,536 Bytes
Index	4,096 Bytes
Total	9,632 Bytes

Row Statistic :

Statements	Value
Format	dynamic
Rows	88
Row length	62
Row size	109 Bytes
Creation	Jul 09, 2004 at 02:15 PM
Last update	Nov 30, 2005 at 10:07 AM

- Print view
- Add new field :  At End of Table
- Propose table structure [\[Documentation\]](#)

Run SQL query/queries on database MetEdReg [\[Documentation\]](#)

SELECT \* FROM `courseReqs` WHERE 1

Fields:

- course\_id
- quiz\_id
- quiz\_name

☒ Show this query here again

Or Location of the textfile :

Compression: ☒ Autodetect ☐ None ☐ "gzipped" ☐ "bzipped"

Query window

Done

## Courses Table

MetEdReg.courses running on localhost - phpMyAdmin 2.5.4 - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://dbmgr.comet.ucar.edu/

phpMyAdmin





































Home



MetEdReg (12)

- DLAC\_orig\_students
- admins
- answers
- category\_quiz
- courseReqs
- courses
- coursesCompleted
- questions
- quiz\_attempts
- quizzes
- results
- users



### Database MetEdReg - Table courses running on localhost

Structure Browse SQL Search Insert Export Operations Empty Drop

Field	Type	Attributes	Null	Default	Extra	Action
<input type="checkbox"/> course_id	int(6)		No		auto_increment	     
<input type="checkbox"/> course_name	varchar(100)		No			     
<input type="checkbox"/> course_nickname	varchar(30)		No			     
<input type="checkbox"/> course_url	varchar(255)		No			     
<input type="checkbox"/> deved_active	char(3)		No	no		     
<input type="checkbox"/> meted_active	char(3)		No	no		     

Check All / Uncheck All With selected:  

Indexes : [\[Documentation\]](#)

Keyname	Type	Cardinality	Action	Field
PRIMARY	PRIMARY	12	 	course_id

Create an index on  columns

Space usage :

Type	Usage
Data	1,428 Bytes
Index	2,048 Bytes
Total	3,476 Bytes

Row Statistic :

Statements	Value
Format	dynamic
Rows	12
Row length	119
Row size	290 Bytes
Next Autoindex	43
Creation	Nov 21, 2005 at 11:10 AM
Last update	Nov 30, 2005 at 11:18 AM

- Print view
- Add new field :  At End of Table
- Propose table structure [\[Documentation\]](#)

Run SQL query/queries on database MetEdReg [\[Documentation\]](#)

SELECT \* FROM `courses` WHERE 1

Fields:

- course\_id
- course\_name
- course\_nickname
- course\_url

[Query window](#)

Done

## Course Completed Table

MetEdReg.coursesCompleted running on localhost - phpMyAdmin 2.5.4 - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://dbmgr.comet.ucar.edu/

phpMyAdmin

Home

MetEdReg (12)

- DLAC\_orig\_students
- admins
- answers
- category\_quiz
- courseReqs
- coursesCompleted
- questions
- quiz\_attempts
- quizzes
- results
- users

### Database MetEdReg - Table coursesCompleted running on localhost

Structure Browse SQL Search Insert Export Operations Empty Drop

Field	Type	Attributes	Null	Default	Extra	Action
<input type="checkbox"/> course_id	int(11)		No	0		
<input type="checkbox"/> email	varchar(100)		No			
<input type="checkbox"/> date_completed	timestamp(14)		Yes	NULL		

[Check All](#) / [Uncheck All](#) With selected:

Indexes: [\[Documentation\]](#)

Keyname	Type	Cardinality	Action	Field
course_id	UNIQUE	568		course_id
				email

Create an index on  columns [Go](#)

Space usage:

Type	Usage
Data	20,728 Bytes
Index	26,624 Bytes
Total	47,352 Bytes

Row Statistic:

Statements	Value
Format	dynamic
Rows	568
Row length	36
Row size	83 Bytes
Creation	Nov 03, 2005 at 11:42 AM
Last update	Nov 03, 2005 at 11:42 AM

- [Print view](#)
- Add new field:  At End of Table [Go](#)
- [Propose table structure \[Documentation\]](#)

Run SQL query/queries on database MetEdReg [\[Documentation\]](#)

SELECT \* FROM `coursesCompleted` WHERE 1

Fields:

- course\_id
- email
- date\_completed

[Insert](#)

☒ Show this query here again

Or Location of the textfile:

[Browse...](#)

Compression: ☒ Autodetect ☐ None ☐ "gzipped" ☐ "bzipped"

[Go](#)

[Query window](#)

Done

## Quiz Questions Table

MetEdReg.questions running on localhost - phpMyAdmin 2.5.4 - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://dbmgr.comet.ucar.edu/

Home

MetEdReg (12)

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- courseReqs
- courses
- coursesCompleted
- questions
- quiz\_attempts
- quizzes
- results
- users

### Database MetEdReg - Table questions running on localhost

Structure Browse SQL Search Insert Export Operations Empty Drop

Field	Type	Attributes	Null	Default	Extra	Action
<input type="checkbox"/> quiz_id	int(11)		No	0		
<input type="checkbox"/> question_text	mediumtext		No			
<input type="checkbox"/> sequence_num	tinyint(2)		No	0		
<input type="checkbox"/> num_responses	tinyint(4)		No	0		
<input type="checkbox"/> answer	varchar(50)		No			
<input type="checkbox"/> possible_points	varchar(50)		No	0		
<input type="checkbox"/> instruction	varchar(100)		No			
<input type="checkbox"/> type	varchar(15)		No			
<input type="checkbox"/> file_name	varchar(100)		No			
<input type="checkbox"/> alt_text	varchar(100)		No			
<input type="checkbox"/> graphic_width	mediumint(5)		No	0		
<input type="checkbox"/> graphic_height	mediumint(5)		No	0		
<input type="checkbox"/> random_answers	char(3)		No	no		
<input type="checkbox"/> date_changed	timestamp(14)		Yes	NULL		

Check All / Uncheck All With selected:

Indexes: [\[Documentation\]](#)

Keyname	Type	Cardinality	Action	Field	Type	Usage	Statements	Value
PRIMARY	PRIMARY	1450		quiz_id	Data	297,928 Bytes	Format	dynamic
				sequence_num	Index	17,408 Bytes	Rows	1,450
					Total	315,336 Bytes	Row length	205
							Row size	217 Bytes
							Creation	Jul 07, 2004 at 12:28 PM
							Last update	Nov 30, 2005 at 10:08 AM
							Last check	Dec 14, 2004 at 02:52 PM

Create an index on 1 columns

- Print view
- Add new field: 1 At End of Table

[Query window](#)

http://dbmgr.comet.ucar.edu/tbl\_properties\_structure.php?lang=en-iso-8859-1&server=1&db=MetEdReg&table=questions

## Question Attempts Table

MetEdReg.quiz\_attempts running on localhost - phpMyAdmin 2.5.4 - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://dbmgr.comet.ucar.edu/

phpMyAdmin

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- quizzes
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- users

### Database MetEdReg - Table quiz\_attempts running on localhost

Structure Browse SQL Search Insert Export Operations Empty Drop

Field	Type	Attributes	Null	Default	Extra	Action
<input type="checkbox"/> quiz_id	int(11)		Yes	NULL		
<input type="checkbox"/> email	varchar(255)		Yes	NULL		
<input type="checkbox"/> score	int(11)		Yes	NULL		
<input type="checkbox"/> date_submitted	timestamp(14)		Yes	NULL		

[Check All](#) / [Uncheck All](#) With selected:

Indexes : [\[Documentation\]](#)

No index defined!

Create an index on  columns [Go](#)

Space usage :

Type	Usage
Data	276,604 Bytes
Index	1,024 Bytes
Total	277,628 Bytes

Row Statistic :

Statements	Value
Format	dynamic
Rows	6,680
Row length %	41
Row size %	42 Bytes
Creation	Aug 11, 2004 at 04:31 PM
Last update	Oct 17, 2005 at 11:01 AM

- [Print view](#)
- Add new field :  At End of Table [Go](#)
- [Propose table structure \[Documentation\]](#)

Run SQL query/queries on database MetEdReg [\[Documentation\]](#)

```
SELECT * FROM `quiz_attempts` WHERE 1
```

Fields:

- quiz\_id
- email
- score
- date\_submitted

[Insert](#)

☒ Show this query here again

Or Location of the textfile :

[Browse...](#)

Compression: ☒ Autodetect ☐ None ☐ "gzipped" ☐ "bzipped"

[Query window](#)

Done

## Quizzes Table

MetEdReg.quizzes running on localhost - phpMyAdmin 2.5.4 - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://dbmgr.comet.ucar.edu/

phpMyAdmin

Home

MetEdReg (12)

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- category\_quiz
- courseReqs
- courses
- coursesCompleted
- questions
- quiz\_attempts
- quizzes
- results
- users

### Database MetEdReg - Table quizzes running on localhost

Structure Browse SQL Search Insert Export Operations Empty Drop

Field	Type	Attributes	Null	Default	Extra	Action
<input type="checkbox"/> quiz_id	int(11)		No		auto_increment	
<input type="checkbox"/> quiz_name	varchar(150)		No			
<input type="checkbox"/> module_url	varchar(255)		No			
<input type="checkbox"/> category	varchar(255)		No			
<input type="checkbox"/> deved_active	char(3)		No	no		
<input type="checkbox"/> meted_active	char(3)		No	no		
<input type="checkbox"/> creator	varchar(50)		No			
<input type="checkbox"/> random_questions	char(3)		No	no		
<input type="checkbox"/> passing_score	tinyint(3)		No	0		
<input type="checkbox"/> completed_quiz	int(11)		No	0		
<input type="checkbox"/> date_changed	timestamp(14)		Yes	NULL		

Check All / Uncheck All With selected:

Indexes: [\[Documentation\]](#)

Keyname	Type	Cardinality	Action	Field
PRIMARY	PRIMARY	100		quiz_id
quiz_name	UNIQUE	100		quiz_name

Create an index on 1 columns

Space usage:

Type	Usage
Data	14,300 Bytes
Index	9,216 Bytes
Overhead	72 Bytes
Effective	23,444 Bytes
Total	23,516 Bytes

[\[Optimize table\]](#)

Row Statistic:

Statements	Value
Format	dynamic
Rows	11
Row length	11
Row size	235 Bytes
Next Autoindex	1
Creation	Mar 08, 2005 at 01:34
Last update	Dec 01, 2005 at 08:33

• [Print view](#)

• Add new field: 1 At End of Table

• [Propose table structure \[Documentation\]](#)

Run SQL query/queries on database MetEdReg [\[Documentation\]](#)

Fields: quiz\_id, quiz\_name

SELECT \* FROM `quizzes` WHERE 1

Query window

Done

## Quiz Results Table

MetEdReg.results running on localhost - phpMyAdmin 2.5.4 - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://dbmgr.comet.ucar.edu/

phpMyAdmin

Home

MetEdReg (12)

- DLAC\_orig\_students
- admins
- answers
- category\_quiz
- courseReqs
- coursesCompleted
- questions
- quiz\_attempts
- quizzes
- results
- users

### Database MetEdReg - Table results running on localhost

Structure Browse SQL Search Insert Export Operations Empty Drop

Field	Type	Attributes	Null	Default	Extra	Action
<input type="checkbox"/> quiz_id	int(11)		No	0		
<input type="checkbox"/> email	varchar(100)		No			
<input type="checkbox"/> answers	text		Yes	NULL		
<input type="checkbox"/> score	smallint(3)		Yes	NULL		
<input type="checkbox"/> passed	char(3)		No	no		
<input type="checkbox"/> random_keys	varchar(255)		Yes	NULL		
<input type="checkbox"/> date_submitted	timestamp(14)		Yes	NULL		

[Check All](#) / [Uncheck All](#) With selected:

Indexes : [\[Documentation\]](#)

Keyname	Type	Cardinality	Action	Field
PRIMARY	PRIMARY	9294		quiz_id email

Create an index on  columns

Space usage :

Type	Usage
Data	1,820 KB
Index	380,928 Bytes
Total	2,192 KB

Row Statistic :

Statements	Value
Format	dynamic
Rows	9,294
Row length	200
Row size	241 Bytes
Creation	Nov 30, 2004 at 01:31 PM
Last update	Nov 30, 2005 at 09:19 PM

- [Print view](#)
- Add new field :  At End of Table
- [Propose table structure \[Documentation\]](#)

Run SQL query/queries on database MetEdReg [\[Documentation\]](#)

SELECT \* FROM `results` WHERE 1

Fields:

- quiz\_id
- email
- answers
- score

[Query window](#)

Done



## Registered Users Table

MetEdReg.users running on localhost - phpMyAdmin 2.5.4 - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://dbmgr.comet.ucar.edu/

phpMyAdmin







































































































Home



MetEdReg (12)

- DLAC\_orig\_students
- admins
- answers
- category\_quiz
- courseReqs
- courses
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### Database MetEdReg - Table users running on localhost

Structure Browse SQL Search Insert Export Operations Empty Drop

Field	Type	Attributes	Null	Default	Extra	Action
<input type="checkbox"/> email	varchar(100)		No			     
<input type="checkbox"/> password	varchar(10)		No			     
<input type="checkbox"/> reminder	varchar(30)		No			     
<input type="checkbox"/> first_name	varchar(20)		Yes	NULL		     
<input type="checkbox"/> last_name	varchar(20)		Yes	NULL		     
<input type="checkbox"/> organization	varchar(50)		Yes	NULL		     
<input type="checkbox"/> office	varchar(255)		Yes	NULL		     
<input type="checkbox"/> supervisor_email	varchar(50)		Yes	NULL		     
<input type="checkbox"/> address	varchar(30)		Yes	NULL		     
<input type="checkbox"/> city	varchar(20)		Yes	NULL		     
<input type="checkbox"/> state	char(2)		Yes	NULL		     
<input type="checkbox"/> zip	varchar(5)		Yes	NULL		     
<input type="checkbox"/> country	varchar(30)		Yes	NULL		     
<input type="checkbox"/> privacy_policy	char(3)		No	no		     
<input type="checkbox"/> mail_list	char(3)		No	no		     
<input type="checkbox"/> date_submitted	timestamp(14)		Yes	NULL		     
<input type="checkbox"/> date_changed	timestamp(14)		Yes	00000000000000		     

Check All / Uncheck All With selected:  

Indexes : [\[Documentation\]](#)

Keyname	Type	Cardinality	Action	Field
email	UNIQUE	2159	 	email

Create an index on  columns

Space usage :

Type	Usage
Data	278,052 Bytes
Index	78,848 Bytes
Total	356,900 Bytes

Row Statistic :

Statements	Value
Format	dynamic
Rows	2,159
Row length	128
Row size	165 Bytes
Creation	Nov 03, 2005 at 11:42 AM
Last update	Dec 01, 2005 at 08:13 AM

[Query window](#)

[Print view](#)

Done

## Browse on Quizzes Table

This is an example view of data in the quizzes table in a mySQL database.

The screenshot shows the phpMyAdmin 2.5.4 interface in a Mozilla Firefox browser window. The title bar reads "MetEdReg.quizzes running on localhost - phpMyAdmin 2.5.4 - Mozilla Firefox". The address bar shows "http://dbmgr.comet.ucar.edu/". The left sidebar lists the database structure for "MetEdReg (12)", including tables like "DLAC\_orig\_students", "admins", "answers", "category\_quiz", "courseReqs", "courses", "coursesCompleted", "questions", "quiz\_attempts", "quizzes", "results", and "users". The main panel displays the "Database MetEdReg - Table quizzes running on localhost". It includes tabs for "Structure", "Browse", "SQL", "Search", "Insert", "Export", "Operations", "Empty", and "Drop". The "Browse" tab is active, showing "Showing rows 0 - 29 (100 total, Query took 0.0007 sec)". The SQL query is "SELECT \* FROM 'quizzes' LIMIT 0, 30". Below the query, there are controls for "Show" (30), "row(s) starting from record # 30", and "Page number" (1). The table is sorted by key: None. The table data is as follows:

quiz_id	quiz_name	module_url	category	deved_active	meted_active
39	Ensemble Forecasting Explained - Pre-Assessment	http://meted.ucar.edu/nwp/pcu1/ensemble/index.htm	NWP	yes	yes
40	Ensemble Forecasting Explained - Module Quiz	http://meted.ucar.edu/nwp/pcu1/ensemble/index.htm	NWP	yes	yes
41	DLAC Lesson 1a - Fog and Stratus Forecast Approach...	http://meted.ucar.edu/dlac/lesson1/index.htm	Aviation	yes	yes
42	mike's test		Other	no	no
43	DLAC Lesson 1b - Radiation Fog	http://meted.ucar.edu/fogstrat/ic31/ic311/index.ht...	Aviation	yes	yes
121	Dispersion Basics	http://meted.ucar.edu/dispersion/basics/index.htm	Other	yes	yes
58	DLAC Lesson 3c - Case Study: Northern	http://meted.ucar.edu/dlac/lesson3c/index.htm	Aviation	yes	yes

## Manual Data Entry

Data can be manually entered into the database via this access point in mySQL.

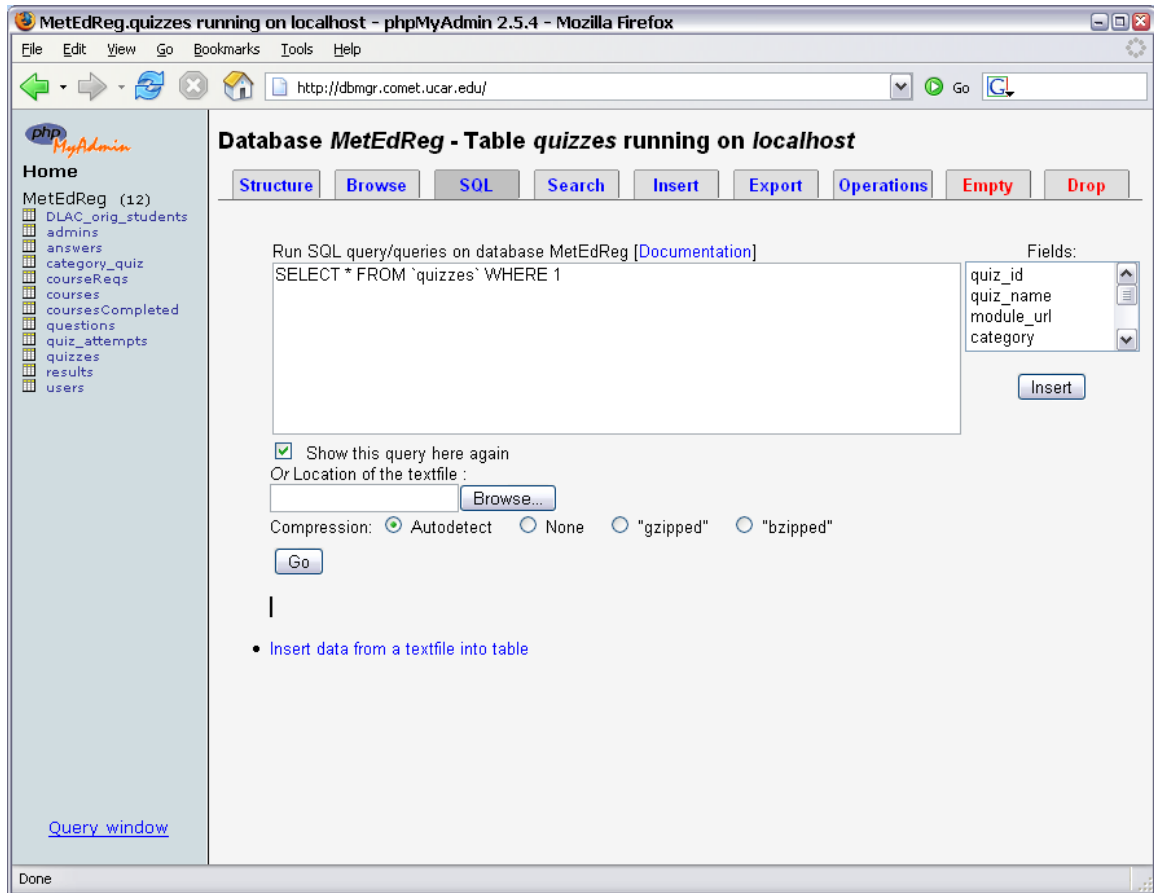
The screenshot shows the phpMyAdmin 2.5.4 interface in a Mozilla Firefox browser window. The title bar reads "MetEdReg.quizzes running on localhost - phpMyAdmin 2.5.4 - Mozilla Firefox". The address bar shows "http://dbmgr.comet.ucar.edu/". The left sidebar displays the "Home" menu with a tree view of the database structure: "MetEdReg (12)" containing "DLAC\_orig\_students", "admins", "answers", "category\_quiz", "courseReqs", "courses", "coursesCompleted", "questions", "quiz\_attempts", "quizzes", "results", and "users". The main panel is titled "Database MetEdReg - Table quizzes running on localhost" and features tabs for "Structure", "Browse", "SQL", "Search", "Insert", "Export", "Operations", "Empty", and "Drop". The "Insert" tab is active, showing a table structure with columns: "quiz\_id" (int(11)), "quiz\_name" (varchar(150)), "module\_url" (varchar(255)), "category" (varchar(255)), "deved\_active" (char(3)), "meted\_active" (char(3)), "creator" (varchar(50)), "random\_questions" (char(3)), "passing\_score" (tinyint(3)), "completed\_quiz" (int(11)), and "date\_changed" (timestamp(14)). Below the table structure is a form for inserting data. It includes a radio button for "Go back to previous page" (selected), a radio button for "Insert another new row", and a "Go" button. The "date\_changed" field is pre-filled with "NOW".

Field	Type	Function	Null	Value
quiz_id	int(11)			
quiz_name	varchar(150)			
module_url	varchar(255)			
category	varchar(255)			
deved_active	char(3)		no	
meted_active	char(3)		no	
creator	varchar(50)			
random_questions	char(3)		no	
passing_score	tinyint(3)		0	
completed_quiz	int(11)		0	
date_changed	timestamp(14)	NOW		

Insert as a new row -- And --  
Go back to previous page  
Or  
Insert another new row  
Go Reset

## SQL Testing

SQL can be tested from this point in the mySQL database.



## MySQL Custom Search

MetEdReg.quizzes running on localhost - phpMyAdmin 2.5.4 - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://dbmgr.comet.ucar.edu/

Home

MetEdReg (12)

- DLAC\_orig\_students
- admins
- answers
- category\_quiz
- courseReqs
- courses
- coursesCompleted
- questions
- quiz\_attempts
- quizzes
- results
- users

Database MetEdReg - Table quizzes running on localhost

Structure Browse SQL Search Insert Export Operations Empty

Select fields (at least one):

- quiz\_id
- quiz\_name
- module\_url
- category
- deved\_active
- meted\_active
- creator
- random\_questions
- passing\_score
- completed\_quiz

• Number of rows per page 30

• Add search conditions (body of the "where" clause):

[Documentation]

Or Do a "query by example" (wildcard: "%")

Field	Type	Function	Value
quiz_id	int(11)	=	<input type="text"/>
quiz_name	varchar(150)	LIKE	<input type="text"/>
module_url	varchar(255)	LIKE	<input type="text"/>
category	varchar(255)	LIKE	<input type="text"/>
deved_active	char(3)	LIKE	<input type="text"/>
meted_active	char(3)	LIKE	<input type="text"/>
creator	varchar(50)	LIKE	<input type="text"/>
random_questions	char(3)	LIKE	<input type="text"/>
passing_score	tinyint(3)	=	<input type="text"/>
completed_quiz	int(11)	=	<input type="text"/>
date_changed	timestamp(14)	=	<input type="text"/>

• Display order:

Ascending Descending

Go

Query window

Done