Using Web 2.0 Technologies to Meet Quality Matters™ (QM) Requirements

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ABSTRACT

Quality Matters™ (QM) is a set of standards to measure the quality of instruction and design in online or hybrid courses. Adopted by a growing number of institutions nationwide, QM is based on best practices and instructional design research. To meet or exceed QM standards requires that resources and learning activities in an online course utilize the latest tools and technologies. In many instances, Web 2.0 technologies are the most appropriate for supporting this course content. This paper will give an overview of the QM Standards and Rubric; and demonstrate how Web 2.0 technologies may be utilized to meet QM requirements.

Keywords: Web 2.0 technologies, Quality Matters Rubric, Quality Matters Standards, Quality Assurance

1. QUALITY MATTERS ™ COURSE DEVELOPMENT

Quality assurance is always a concern when dealing with online delivery. Quality Matters™ (QM) is a set of standards designed to provide the best practices in instructional design for courses that are delivered fully online or with a significant portion delivered online, i.e. hybrid courses (Lorenzetti, 2004). In this discussion, we will use the term "online course" to mean both online and hybrid course. The focus of QM is to promote student learning, and is essentially a faculty-driven, peer reviewed process. As described on its own web site (QM, 2008):

Quality Matters (QM) is a faculty-centered, peer review process designed to certify the quality of online courses and online components. Sponsored by MarylandOnline, Inc., Quality Matters has generated widespread interest and received national recognition for its peer-based approach to quality assurance and continuous improvement in online education. Originating from a FIPSE grant, Quality Matters is now a self-supporting organization offering institutional subscriptions and a range of fee-based services including Quality Matters-managed course reviews and an array of trainings.

Currently there are 204 subscribers in 38 states, with nine states adopting the QM standards statewide.

To meet QM standards, a course does not have to obtain 100% in the peer review; at a level of 85%, an online course is considered to be of high quality. However, course development and peer review to enhance quality improvement should be a continuous process. Figure 1 illustrates this process.

Figure 1. Continuous Improvement Model for Assuring the Quality of Online Courses

QM focuses on course design, rather than on course delivery or the academic content of the course. A set of forty specific elements, distributed across eight broad categories, have been identified. The eight categories, which are used to evaluate the design of online courses, are:

1) <u>Course Overview and Introduction</u> – The course design helps students understand how to get started in the course.

2) <u>Learning Objectives</u> – Course and module learning objectives are easy to understand and help students focus their efforts in the course.

3) <u>Assessment and Measurement</u> – Assessments measure the learning objectives and are an integral part of the learning process.

4) <u>Resources and Materials</u> – Instructional materials are prepared by qualified personnel and are sufficient to cover the learning objectives.

5) <u>Learner Engagement</u> – The course is designed to encourage interaction between instructor and students, among students, and between students and the course materials.

6) <u>Course Technology</u> – Navigation in the course ensures student access to instructional materials and technology is used to foster student engagement.

7) <u>Learner Support</u> - The course offers resources to institutional services to ensure student success.

8) <u>Accessibility</u> - All students have access to the course components.

These eight broad categories are further refined into forty standards, which are assigned different point values, ranging from three (3) points for essential, two (2) points for very important, to one (1) point for important elements. At the heart of the QM process is the *QM Rubric*, which provides a quantitative measurement for evaluating the quality of the online course. There is a total of 80 possible points for the entire rubric (shown in Appendix 1).

These standards provide a checklist for developing an online course. QM does not specify where these elements should occur, but rather that the elements should be included somewhere within the course materials. The QM review process is applicable for courses in which a Course Management System (CMS), such as Blackboard ™ or Web CT is utilized. After completion of the course development, the course is then reviewed by a qualified QM Peer Review team. The course must obtain a score of 85% or above to pass the peer review.

A person must undergo training to become a peer reviewer. There are two levels of reviewer certification: (1) Peer Reviewer and (2) Master Reviewer. Peer Reviewer certification allows a person to serve on QM peer review teams. To obtain certification, the person must complete one QM Rubric workshop and have current online teaching experience, i.e. must have taught online within the last 18 months.

A Master Reviewer is permitted to assist teams in interpreting the review standards and to serve as Team Chair for peer review teams. To qualify as Master Reviewer, a person must have completed a minimum of two QM Peer Reviews and also complete a rigorous two week workshop.

In the remainder of the paper, we will present the impetus for utilizing the QM standards for developing an online curriculum in CIS (Section 2). Section 3 will describe the instructional design and technology training that was developed by our university to prepare instructors for QM development. The utilization of Web 2.0 technologies within the QM framework is illustrated in Section 4, and conclusions follow in Section 5.

2. IMPETUS FOR QM APPLICATIONS IN CIS

All evidence indicates that the number of students who are electing to major in computing-related fields, such as Computer Information Systems (CIS), Computer Science (CS), and Management Information Systems (MIS) has declined dramatically since 2000 (Lomerson, 2005, Pollacia, 2006, Vesgo, 2007). After six years of steady declines, the number of new CS majors at our institution in Fall of 2006 was only half of what it was in Fall of 2000.

To counteract this decline, our CIS department decided to develop a new minor in CIS (Patterson, 2006, Russell, 2008). Students who are majoring in General Studies are required to have a minor at our university, and there were relatively very few minors attractive to these students. We determined that a CIS minor would be popular with students of any major, and would provide a framework for the additional service courses that we wanted to offer. Furthermore, we hoped that some of the students choosing to minor in CIS would also see the benefit to double major in CIS or possibly change their major to CIS. We termed the expression "recruiting in place" because this activity consists of recruiting students who are already enrolled at our own university.

To begin the process of developing the minor, we conducted a review of minors offered in CIS at colleges and universities in the United States (Pollacia, 2008). Based on the study and in keeping with the rules of the Louisiana Board of Regents, we determined that the CIS minor will consist of 6 classes (18 hours). New courses have been developed specifically for the minor and are significantly less technical than the CIS major; therefore any student at our institution may enroll in these courses.

The university requested that the minor be available to distance learning students, and had recently adopted QM standards for online course quality control. This is what led to the development of the online courses that meet QM standards.

In the following section, we will examine the instructional design and the technology training that was provided by the university's Electronic and Continuing Education staff to prepare instructors for development of online courses using the QM design and review process.

3. INSTRUCTIONAL DESIGN AND TECHNOLOGY TRAINING

Our experience with Web 2.0 technologies (O'Reilly, 2005) and the QM process originated with a National Science Foundation Title III grant, which provided training for one academic year, beginning in the Fall Semester of 2007 and continuing through the Spring Semester of 2008. The training consisted of two components: *Instructional Design*

training and *Technology training*. There were two levels of training, described below.

The Level 1 training consisted of topics mainly to address faculty concerns about online delivery in general. The instructional design theories were covered, including Bloom's Taxonomy (Bloom, 1956). It was emphasized that a quality course would utilize the various levels of learning outlined by Bloom. The training for each of these was divided into modules, which covered the following topics under instructional design:

- An introduction to instructional design including instructional design theories
- Writing objectives based on Bloom's Taxonomy
- Developing an online syllabus, course policies and procedures
- Designing materials for different learning styles
- Creating and using rubrics

The technology training included the following topics:

- Basic Windows and File Management
- Using Media applications in online course
- Web 2.0 GIMP to create course banners and graphics
- Web 2.0 Audacity to create audio recordings for assignments
- Web 2.0 Photostory to create visually attractive presentations that include audio
- Web 2.0 Google docs for collaboration
- Using Adobe Acrobat

Level 2 training focused on building course modules that were founded on quality learning outcomes using the Bloom's Taxonomy. This training also focused on how to build rubrics and checklists. The faculty had to build example rubrics that would be used in their own classes. The courses were developed so that they would eventually adhere to QM standards as measured by the QM Rubric (Appendix 1). The new courses were submitted for review by a qualified peer reviewer. If the course did not meet expectations according to the rubric then the course was revised until it met those expectations. Only courses that passed the expectations of this Rubric became a part of the NSF Title III online course offerings. Diagrams for the training levels are included in Appendix 2.

As can be seen, Web 2.0 technologies play a prominent role in the training components. Although there is some discussion as to what constitutes a Web 2.0 technology, there is agreement that they are more than a set of "cool" technologies and services. Web 2.0 technologies will exhibit all or some of the following characteristics (Anderson, 2007), all of which are well-suited to support teaching and learning activities in an online environment:

- User-generated content
- The harnessing of collective intelligence (i.e. wisdom of the crowd)
- Extremely large amounts of data
- Dynamic versus static content
- Social sharing and bookmarking

Over the course of the two levels of training, the instructional design and technology trainers focused on how instructors could harness the power of Web 2.0 technologies and use them to support many of the standards that are required to develop the course content for a QM certified course. In the next section, we select some of the QM standards from the QM Rubric, and provide examples for utilizing Web 2.0 technologies to satisfy the requirements set forth by those standards.

4. UTILIZING WEB 2.0 TO MEET QM ™ STANDARDS

This section demonstrates how certain Web 2.0 technologies may be used to meet QM standards. Out of the set of eight broad categories listed in the QM Rubric, Web 2.0 technologies lend themselves most readily to providing innovative solutions for the following five standards:

1) Course Overview and Introduction. We utilize a visual technology to provide instructor and student introductions.
2) Learning Objectives. – A Web 2.0 technology assists instructors in writing correctly formed learning objectives.
3) Resources and Materials. This standard requires that instructional materials have sufficient breadth, depth, and currency, which is precisely what Web 2.0 technologies can do.
4) Learner Engagement. This is the primary area where Web 2.0 technologies can excite and engage the student.
5) Course Technology – Navigation in the course ensures student access to instructional materials and technology is used to foster student engagement.

We have not included (3) Assessment and Measurement because assessment is not radically impacted by the technology used. Category (7) mainly refers to the local university resources that provide academic support, and (8) is concerned with auditory and visual accessibility to support ADA requirements, thus are also not included in this section. We will now look at how we have utilized Web 2.0 technologies to implement the following two standards in category (1) Course Overview and Introduction.

Standard 1.4 Self-introduction by the instructor is appropriate and available online.

Standard 1.5 Students are requested to introduce themselves to the class.

Both of these standards are met by including an activity called 'All About Me', in which both the instructor and students introduce themselves to the rest of the class. Students may post their introductions in the Discussion Board using Blackboard (as shown in Figure 2), or they have the option of using their Facebook home page, which also provides a public introduction.

There are advantages and disadvantages of using an online student's Facebook page to introduce themselves to the class. Advantages include the fact that the page is already in place and provides a more in-depth profile of the person, as well as the fact that most students have a Facebook page, and interact regularly with Facebook. Facebook also permits a more robust introduction, as students may include text and photos and write on each other's "wall" (Guess, 2008).
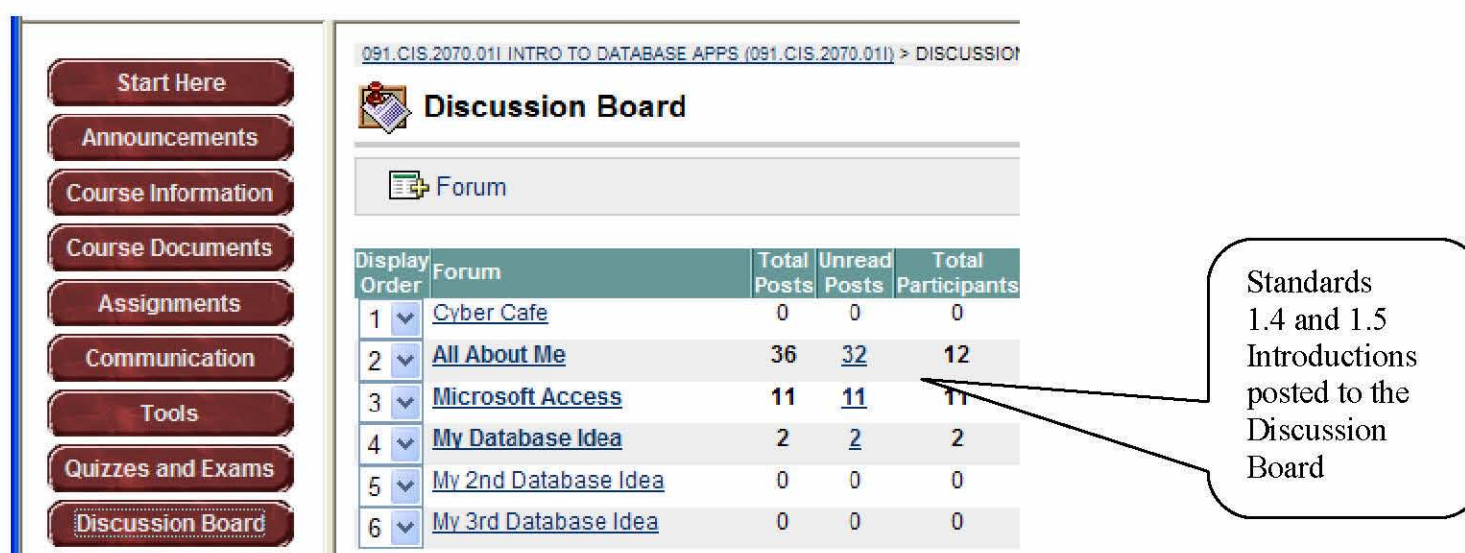
Figure 2. Introduction of Instructor and Students

However, there are potential disadvantages to using one's Facebook page in this way. For one thing, many non-traditional students (i.e. older, working adults) are not familiar with Facebook, and are not comfortable using it. Another thing to consider is that all of the other students in the class have to be added as "friends" in order to view the student's Facebook page. Many students have expressed the view that they prefer to keep work and pleasure separate, and they do not wish to mix class work with their social Facebook activities.

Another Web 2.0 technology that is useful for this introduction activity is ToonDoo (2007). This web site permits the students to easily create a cartoon containing characters, backgrounds, props, and speech bubbles on a selection of panel layouts. This provides a creative, visual depiction of "All About Me" that many of today's' students prefer over textual information.

The focus of QM category (2) is the development of appropriate learning objectives. Here is one of the standards from this category:

Standard 2.3 All learning objectives are stated clearly and written from the students' perspective.

Objectives must be developed that are based on Bloom's taxonomy of learning (Bloom, 1956). Instructors are introduced to Radio James Objectives Builder (Builder, 2009) that can be used to write their objectives to meet this standard (see Figure 3). While it may not have all of the characteristics of a Web 2.0 application, it does have some of the features of a Web 2.0 technology, and has proven to be very useful to online educators.

Instructional materials that utilize Web 2.0 technologies can certainly be characterized as having sufficient breadth, depth, and currency, which is precisely what is required to implement Standard 4.3.

Standard 4.3 The instructional materials have sufficient breadth, depth, and currency for the student to learn the subject.

For example, a typical database modeling assignment requires students to create an Entity-Relationship Diagram that models a relational database. Using the Web 2.0 application at Gliffy (2008), students can create and post the Entity-Relationship Diagram at the site, so that they can view each others' work. In addition to the Entity-Relationship Diagram, they are required to use the blog and collaboration features to make comments and suggestions concerning other students' E-R Diagrams. This collaboration helps to strengthen the understanding of the concepts because students view a variety of examples, and in addition, serve as a reviewer to critique other students' work.

Web 2.0 technologies are precisely suited for implementing the following standard from category 5:

Standard 5.2 Learning activities foster instructor-student, content-student, and if appropriate to the course, student-student interaction.

One of the most frequently utilized Web 2.0 application is the Web log, or blog, which provides a forum where all class participants can contribute their ideas and comments. Online instructors have embraced the use of blogs because of the simplicity of creating and maintaining the blog. No HTML programming knowledge or skill is required; the blog can be hosted and published through free providers, and students can easily utilize the blog. These features are particularly attractive for educational institutions that do not have the facilities or technical infrastructure to provide online course management systems (CMS), such as Blackboard ™.

For example, a teacher posts questions about current subject matter on the blog. Students respond in writing and can contribute collaboratively. One of the things that blogging does for students is it allows them to explore ideas and post material in an on-going conversational fashion. Bartlett-Bragg contends that blogging strategies "enrich the learning experience and provide an opportunity for learners to shift from surface to deeper levels of learning." (Bartlett-Bragg, 2003)

Instructors that have access to an online CMS may debate the utilization of a blog over the "Discussion Board" feature of Blackboard (or similar CMS). Discussion Board simply allows students to upload textual material; however to upload presentations, audio, video, and other forms of course content they must use the "attachment" feature (Kruper, 2003). Therefore the Discussion Board is for discussion, but a blog is a much more effective forum for web publishing of the wide variety "learning artifacts" that
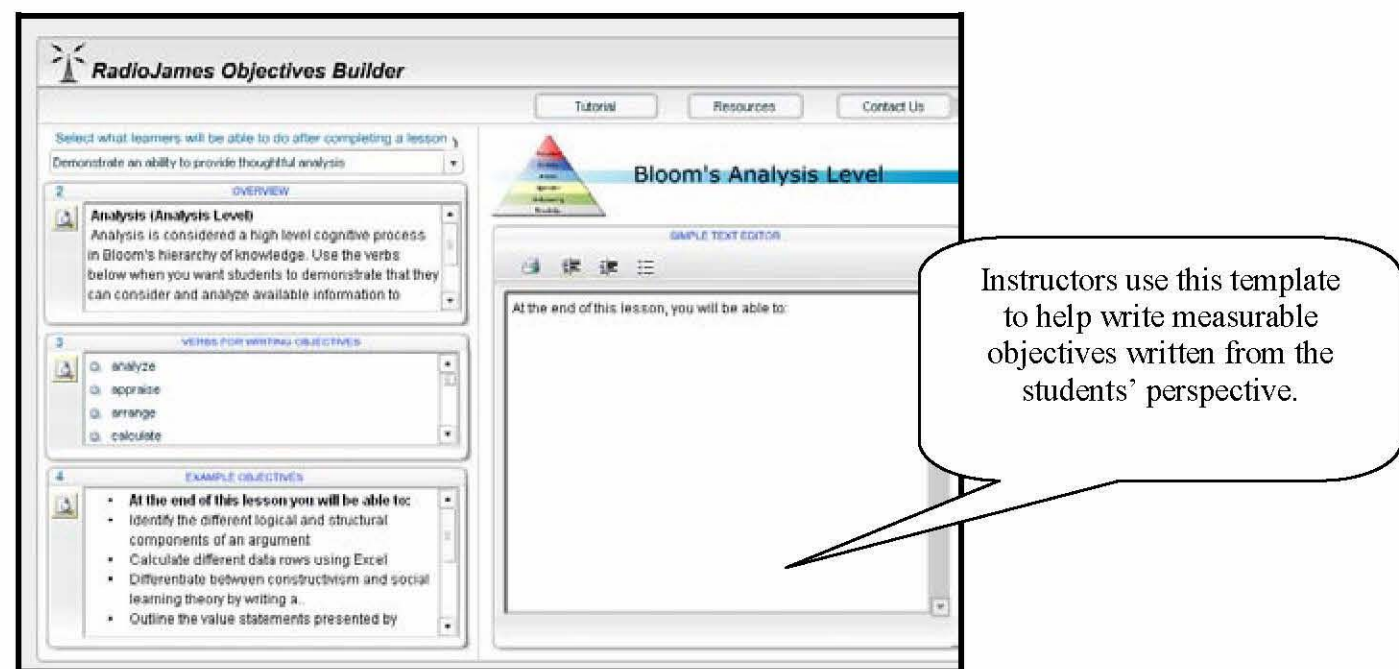
Figure 3. Developing Learning Objectives

Figure 4. Course Branding with Banner and Menus

are produced by today's students (Richardson, 2008). Other advantages which may motivate students to respond using a blog instead of the CMS are:

- Most students are already engaged by blogs to communicate socially.
- Students can personalize a blog, so that the look is not so uniform.
- Blogging represents a different learning activity from the Discussion Board forum.
- A blog does not restrict participation to students; therefore ideas may flow more freely and to a larger population.

In relation to QM standards, blogs precisely provide the appropriate forum for fostering instructor-student, content-student, and student-student learning activities.

One recurring emphasis of QM development process is to provide student engagement so that students become active, rather than just passive, learners. This is stated in standard 6.2, as shown:

Standard 6.2 The tools and media support student engagement and guide the student to become an active learner.

Four central themes that summarize and express the impact of Web 2.0 in education have been identified: Inquiry, Literacies, Collaboration, and Publication (Crook, 2008). Each of these themes not only supports, but also requires, the active engagement of students. These four themes, with appropriate examples of Web 2.0 applications, are detailed below:

Inquiry: Web 2.0 tools encourage new methods for a learner to conduct research. There are new types of course content, new methods of organization, and robust tools to investigate this rich body of information. Wikiversity (Wikiversity, 2009) is a division of Wikipedia that provides learning resources, projects, and communities to support educational research.

Literacies: The traditional notation of "literacy" is expanded by new digital media. Learners may creatively engage the material through means of expression other than the written word. For example, at PodCastSchool (PodCastSchool, 2009), students may download and listen to podcasts, while viewing the accompanying graphics and videos.

Collaboration: Web 2.0 provides educators with tools that permit strong collaboration and communication between students, thus building class communities. For example,

PBWorks (PBWorks, 2009) provides classroom "workspaces' where students can engage and collaborate. Another project is SchoolNet Global, which is an international site that describes itself as "the world's biggest children's collaborative project" (SchoolNet, 2009).

Publication: Web 2.0 technologies provide both a means for publication of original work, but also an audience for the viewing of that work on display. For example, the Oracle Foundation has imitated a learning project called ThinkQuest (ThinkQuest, 2009) where students have the opportunity to publish their original work and to collaborate with other students from around the world. The web site is monitored by teachers and password protected to provide a secure environment.

Training participants learned to use GIMP, a Web 2.0 application to create a banner and customized course menus, and in the process, satisfied the requirements of standard:

Standard 6.3 Navigation throughout the online components of the course is logical, consistent, and efficient.

The use of GIMP allowed instructors to brand their course, and make the user interface more consistent and efficient. (Figure 4.)

The standards and examples of Web 2.0 technologies shown here are not intended to represent the entire set of possibilities. These are merely a few examples that illustrate the potential that these technologies can play, particularly when designing a course to meet QM standards.

5. CONCLUSIONS

Quality Matters ™ (QM) is a program that is concerned with quality assurance of online course design that has been adopted by many institutions nationwide. This program offers quality assurance through a rubric, containing eight broad categories or dimensions, and a process of peer review. To meet or exceed QM standards requires that course content and learning activities in online courses utilize the latest tools and technologies.

The problem of declining CIS enrollments was the motivation for utilizing the QM standards for developing an online curriculum in CIS at our university. Instructors had to undergo a program of instructional design and technology training to prepare them for QM course development. This paper illustrated that, in many instances, Web 2.0 technologies are the most appropriate for designing course content.

As online programs continue to proliferate, many educators and institutions have concerns about the quality of online education compared to traditional course delivery. Quality assurance is becoming increasingly more significant, not just for educational stakeholders, but for employers as well. We believe that the QM program, while not being a total solution, provides a flexible and low-cost quality assurance process that institutions can adopt to ensure their academic standards are being met in their online course offerings.

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Lissa F. Pollacia is the Roy O. Martin Professor of Computer Information Systems at Northwestern State University In Natchitoches Louisiana. She has written and served as Principal Investigator for numerous research grants. A leader in the area of Web-based instruction, she was instrumental in developing online curricula. She currently teaches CIS courses in the area of database management systems and object-oriented programming. In addition, she serves as the national coordinator for the Database Design contest at the AITP National Collegiate Conference. She was awarded the Mildred Hart Bailey Award for Outstanding Research in 1996 and the Excellence in Teaching Award for the College of Business in 2004. Her research interests are in the fields of database systems and the utilization of technology in education.

Terrie S. McCallister is an Instructional Technology Specialist at Northwestern State University in Natchitoches Louisiana. With twenty –five years of teaching experience, she has served as a Special Education teacher, a Librarian and a Technology Facilitator. She has spent the last 10 years in promoting online learning by developing and teaching prof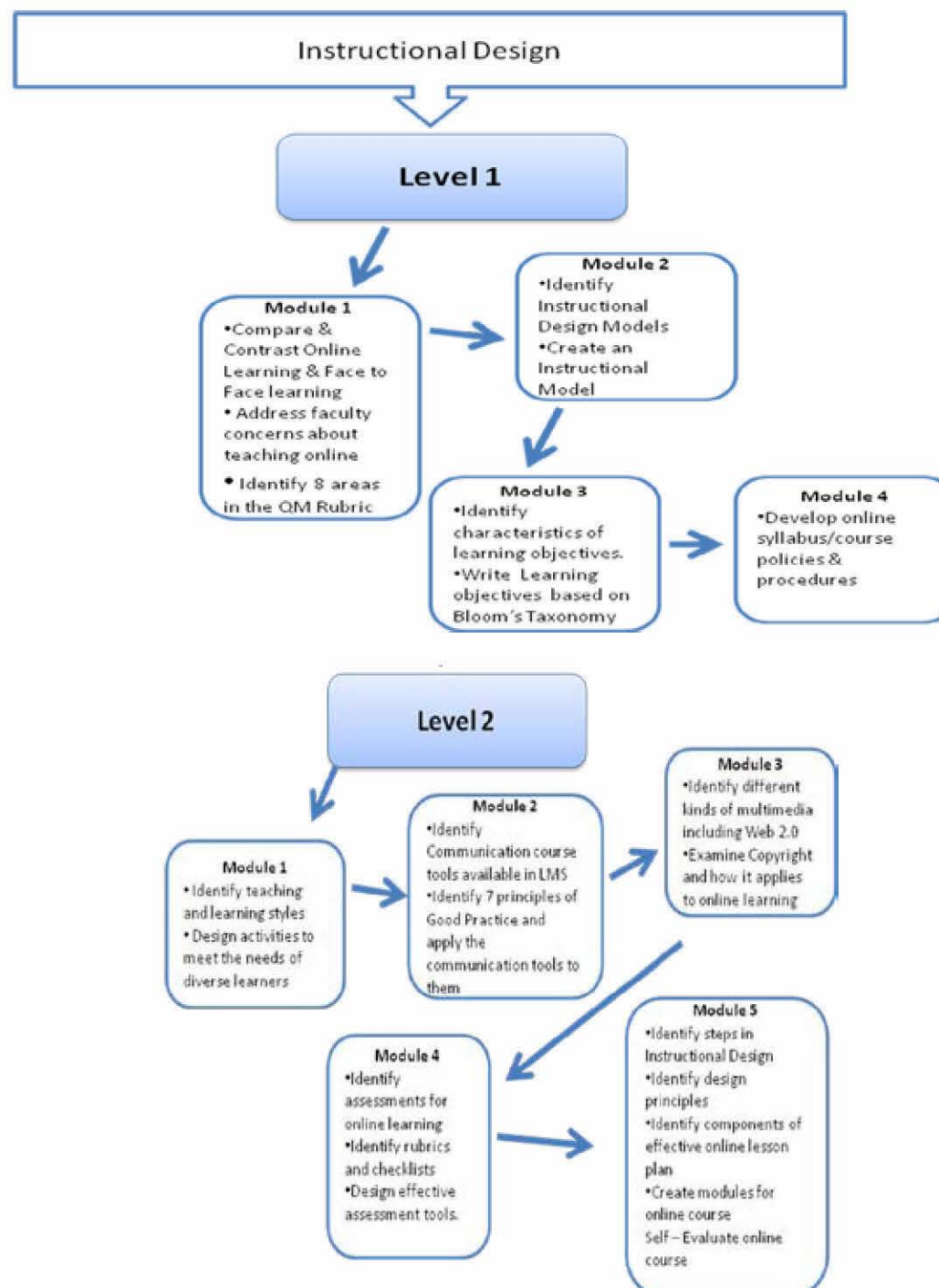essional workshops. She is a Quality Matters Peer Reviewer and has had extensive training in use of the QM Rubric. She currently works in Electronic and Continuing Education with faculty in the development of online courses. She also teaches Educational Technology courses online. Her research interests are in the fields of online learning and technology integration.
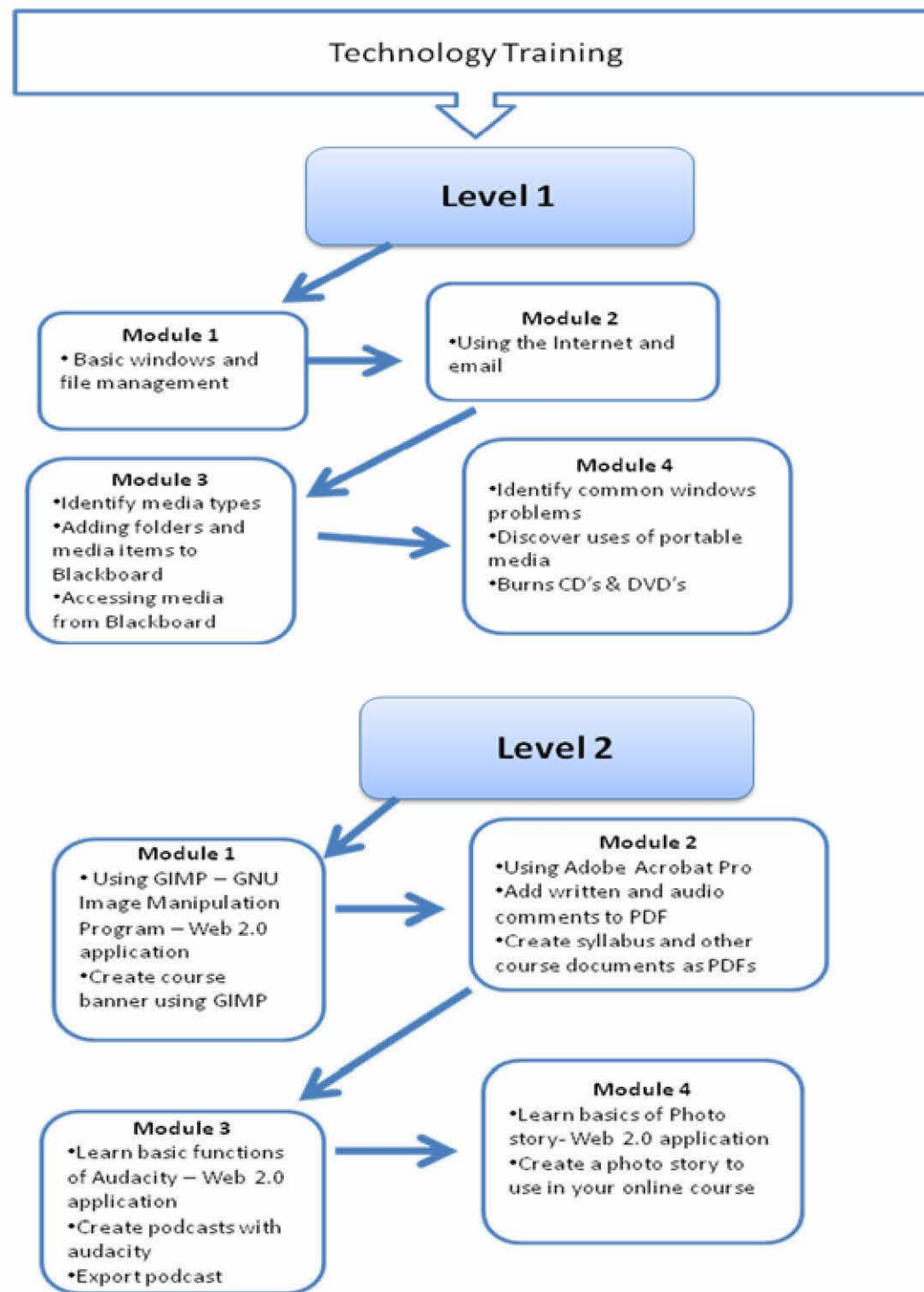
Appendix 1
The QM Rubric

	Review Standards	Points	Yes	No
Course Overview	1.1 Instructions make clear how to get started and where to find various course components.	3		
	1.2 A statement introduces the student to the purpose of the course and to its components; in the case of a hybrid course, the statement clarifies the relationship between the face-to-face and online components.	3		
	1.3 Etiquette expectations (sometimes called "netiquette" for online discussions, email, and other forms of communication are stated clearly.	1		
	1.4 The self –introduction by the instructor is appropriate and available online.	1		
	1.5 Students are asked to introduce themselves to the class.	1		
	1.6 Minimum student preparation, and, if applicable, prerequisite knowledge in the discipline are clearly stated.	1		
	1.7 Minimum technical skills expected of the student are clearly stated.	1		
Learning Objectives	2.1 The course learning objectives describe outcomes that are measurable.	3		
	2.2 The module/unit learning objectives describe outcomes that are measurable and consistent with the course-level objectives.	3		
	2.3 The learning objectives are stated clearly and written from the students' perspective.	3		
	2.4 Instructions to students on how to meet the learning objectives are adequate and stated clearly	3		
	2.5 The learning objectives are appropriately designed for the level of the course.	2		
Assessment & Measurement	3.1 The types of assessments selected measure the stated learning objective and are consistent with course activities and resources.	3		
	3.2 The course grading policy is stated clearly	3		
	3.3 Specific and descriptive criteria are provided for the evaluation of students' work and participation.	3		
	3.4 The assessment instruments selected are sequenced, varied and appropriate to the content being assessed.	2		
	3.5 "Self Check" or practice types of assignments are provided for timely student feedback.	2		
Resources and Materials	4.1 The instructional materials contribute to the achievement of the stated course and module/unit learning objectives.	3		
	4.2 The relationship between the instructional materials and the learning activities is clearly explained to the student.	2		
	4.3 The instructional materials have sufficient breadth, depth, and currency for the student to learn the subject.	2		
	4.4 All resources and materials used in the course are appropriately cited.	1		
Learner Engagement	5.1 The learning activities promote the achievement of stated learning objectives.	3		
	5.2 Learning activities foster instructor-student, content-student, and if appropriate to this course, student-student interaction.	3		
	5.3 Clear standards are set for instructor response and availability.	2		
	5.4 The requirements for course interaction are clearly articulated.	2		
Course Technology	6.1 The tools and media support the learning objectives, and are appropriately chosen to deliver the content of the course.	3		
	6.2 The tools and media support student engagement and guide the student to become an active learner	3		
	6.3 Navigation throughout the online components of the course is logical, consistent, and efficient.	3		
	6.4 Students have ready access to the technologies required in the course.	2		

	6.5 The course components are compatible with current standards for delivery modes.	1		
	6.6 Instructions on how to access resources at a distance are sufficient and easy to understand.	1		
	6.7 The course design takes full advantage of available tools and media.	1		
Learner Support	7.1 The course instructions articulate or link to a clear description of the technical support offered.	2		
	7.2 Course instructions articulate or link to an explanation of how the institution's academic support system can assist the student in effectively using the resources provided.	2		
	7.3 Course instructions articulate or link to an explanation of how the institution's student support services can help students reach their educational goals.	1		
	7.4 Course instructions articulate or link to tutorials and resources that answer basic questions related to research, writing, technology, etc.	1		
Accessibility	8.1 The course incorporates ADA standards and reflects conformance with institutional policy regarding accessibility in online and hybrid courses.	3		
	8.2 Course pages and course materials provide equivalent alternatives to auditory and visual content.	2		
	8.3 Course pages have links that are self-describing and meaningful.	2		
	8.4 The course ensures screen readability.	1		

Appendix 2
Quality Matters Instructional Design and Technology Training

Technology Training

Level 1

Module 1
• Basic windows and file management

Module 2
•Using the Internet and email

Module 3
•Identify media types
•Adding folders and media items to Blackboard
•Accessing media from Blackboard

Module 4
•Identify common windows problems
•Discover uses of portable media
•Burns CD's & DVD's

Level 2

Module 1
• Using GIMP – GNU Image Manipulation Program – Web 2.0 application
•Create course banner using GIMP

Module 2
•Using Adobe Acrobat Pro
•Add written and audio comments to PDF
•Create syllabus and other course documents as PDFs

Module 3
•Learn basic functions of Audacity – Web 2.0 application
•Create podcasts with audacity
•Export podcast

Module 4
•Learn basics of Photo story- Web 2.0 application
•Create a photo story to use in your online course

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