

Running head: CMAT: The Clinical Medicine Assessment

Figure 1: CMAT Application Design created by Veronika Eskova 2004.

CMAT:**The Clinical Medicine Assessment Tool****Project**

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Problem

In the Student Project Proposal presented in the 2004 Design Studio class by Eric Replinger and Dan Klassen, the project was described as:

- A data collection form and database for research study in Physician Assistant (PA) students' application of published evidence.
- A structured exercise to see how well PA students are able to evaluate the quality of the evidence for a specific clinical action.

Client goals as identified by the client include:

- Creating a reliable means to collect, assess, and evaluate data as it pertains to the support in teaching PA students the application of principles of evidence-based medicine. The tool will be a shell that is cross functional and can be used with a variety of content.
- Enhancing the learning experience for PA students by providing a technology-based performance support tool that will make the present simulated learning environment more authentic.

Evidence-based medicine requires practicing PA students to consult written literature on their original diagnosis, which in turn, is used to aid in further diagnosis and treatment of the patient. Practicing evidence-based medicine requires clinicians to validate and authenticate the material to which they refer.

Studies have shown that PA students studying the application of principles for evidence-based medicine have a tendency to question their confidence after reading an evidence-based abstract that may contradict their original patient diagnoses. Learning to evaluate the validity of such an abstract, will lead to greater accuracy in diagnosis as well as greater student confidence in their decisions.

At UCHSC, PA students examine standardized patients in a simulated, problem-based learning environment. The PA students examine a patient and hypothesize a diagnosis based on their initial assessment of the patient's condition. After their original diagnosis, the PA students consult their supervisor for further information. The supervisor offers specific evidence-based medical information to the students based on their initial assessments and preliminary diagnoses. After reviewing the evidence provided by their supervisor, the PA students are asked to make final diagnoses.

The current methodology makes it difficult to gather and assess data necessary to determine the presence of a performance gap. The need is to develop a tool that will allow the professor to accurately determine whether PA students, when presented with an evidence-based medical abstract, possess the ability to accurately validate, evaluate, and apply evidence contained within the abstract. The implementation of an assessment tool provides the professor with an opportunity to extract and evaluate data from the learning environment.

Based on such data, the professor assesses the strengths and weaknesses of the PA students' performances in the simulated learning environment. If necessary, the professor could then modify the curriculum based on the PA students' ability to apply the learned information in context.

The assessment tool also doubles as a technology-based performance support tool. If the information (evidence-based abstract) and communication are presented in an electronic format, the simulated learning environment becomes more authentic. The PA students would access, input, and retrieve information electronically, much the way they would do in a real environment. This performance support tool will emphasize, test, and eventually strengthen the PA students' abilities to evaluate, validate, and practice evidence-based medicine.

Analysis

The Clinical Medicine Assessment Tool (CMAT) was developed to assist University of Colorado Health Sciences Center (UCHSC) students, particularly Physician Assistant (PA) students, in diagnosing a standardized patient in a clinical scenario. In addition, CMAT is a data collection instrument that tracks PA students' diagnoses, treatment plans, confidence levels, and responses to randomly selected abstracts. This assessment tool is one piece in a greater evaluation scheme for accessing the PA students at UCHSC.

The following areas were analyzed for this project:

- Task Analysis
- Learner Analysis
- Environmental Analysis

Task Analysis

Current Methodology

PA students are asked to:

1. Go into an exam room to diagnose a standardized patient.
2. Develop and hand-write the initial diagnosis and ordering of tests.
3. Confer with a supervisor (professor) to get more information.
4. Decide whether their initial diagnosis and/or ordering of tests are correct.
5. Finish with the patient

Desired Methodology

1. Student presented with simulated, problem-based scenario.
2. Asked to develop a preliminary diagnosis based on initial patient assessment.
3. Student logs-in to Clinical Medical Assessment Tool.
4. Student identifies a researchable question based on scenario.
5. Student identifies search terms to be utilized.
6. Student asked to complete Initial Diagnosis Form:
 - a. Treatment Decision: yes/no.
 - b. Test Ordered: yes/no.
 - c. Confidence of response – scale
7. On submission of this preliminary assessment, the student is delivered the Research Abstract Form.
8. Student reads abstract.
9. Student asked to complete Final Diagnosis Form:
 - a. Which abstract was read?
 - b. Treatment Decision: yes/no.
 - c. Test Ordered: yes/no.

- d. Confidence of response – scale.
- e. Explain why it changed or did not change.

Learner Analysis

The primary audience for the data collection and assessment instrument will be PA students at the UCHSC. These are first and/or second year PA students. The PA students are enrolled in a 32-month Master's curriculum. Upon completion of the program graduates receive a certificate qualifying them to take a national certifying exam for practice as a Physician Assistant.

PA students are required to own a computer and most are computer literate upon entry to this graduate level program. All PA students have home access and access on campus through a T-1 line.

PA students are in the first or second-year of a three-year curriculum where they learn to diagnose and treat 90% of the cases seen in a Pediatric or Internal Medicine practice.

General Learner Characteristics

- First and second-year Master's PA students
- UCHSC PA program operates on quarters, not semesters
- Computer literate – Familiarity with Blackboard
- Communicate via email
- Other online classes
- Varied – College graduates and above
- Gender –m/f
- High-stress – Maybe easily frustrated if technology fails

Environmental Analysis

Physical Description of the Learning Environment

- Final Examination setting
- Sterile
- Quiet
- Cubicles
- High-stress

- Video camera(s)
- Exam room(s)
- Multiple people – other PA students taking the exam, patients, instructors, professors
- Loud speaker, intercoms

Possible Distractions of the Physical Environment Include

- Failure of technology
- Workstation or laptop fails and needs to be rebooted
- Application fails to connect to the database
- No Intranet connection available
- Server down
- Extraneous Noise

Technical Environment/Delivery Platform

- Online
- Possibly through Blackboard
- Clinical Medical Assessment Tool
- T1 connections available
- Workstations (eventually laptops)

Method

We defined our project by using the materials given to us by the professor and by working with our SME. It is important to note that this project is essentially a software development project, and the Clinical Medical Assessment Tool is not designed to teach specific skills. It is a tool to be used by the professor to collect data towards the assessment of learning. The following visuals depict how we defined the scope of the Clinical Medical Assessment Tool project.

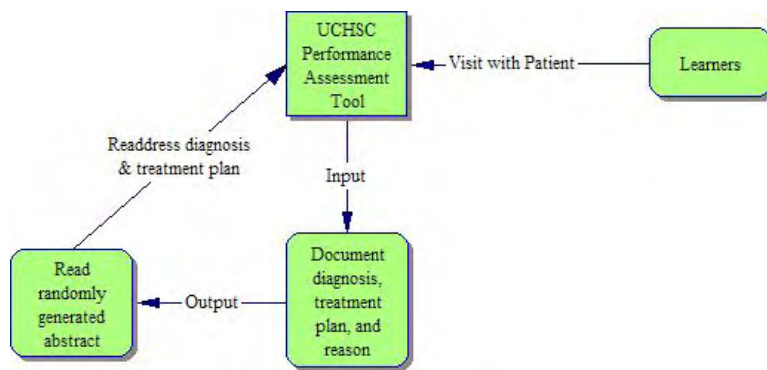


Figure 1

Figure 1 depicts how the PA students will use the Assessment Tool. Upon visiting with a patient, the learner will input an initial diagnosis and treatment plan. The Tool will randomly generate a research abstract for the learner. After reading the abstract, the learner must evaluate it for its validity and importance to the initial diagnosis and treatment plan. The learner will then input any changes to the initial diagnosis and treatment plan. In addition, the learner will input the level of confidence with the selected course of action.

Application Structure

We built the application to:

- Consist of a user interface that will allow for the capture of the diagnosis that the PA students enter.
- Have a database for storing the information, and an administrator interface for inputting data and running reports.
- Allow the professor to analyze students' diagnosis and use this information for the students' evaluation.

Findings

The Clinical Medical Assessment Tool will help the professor assess whether the students are analyzing an abstract correctly, which is related to a medical case they are being tested on. The outcome of our project is still to be determined, as the professor will be using the tool for future classes. The final product we are delivering allows the professor to track the student's Initial Diagnosis, Initial Treatment Plan, Questions, Keywords, Abstract read, Revised Diagnosis, and Revised Treatment Plan. We are also delivering an Administrator interface and database. The tool is web based and students will access the tool from the school testing lab. Our project was very challenging and took extra time to complete. To develop an assessment tool like this in this short time period was a great accomplishment for our team. The tool will give the professor valuable data to study, which will help her in the teaching of her students.

Evaluation

Our Level 1 Evaluation: Assessing Reaction

Navigation

- Ease of use
- Navigational aids are obvious, intuitive, and consistent through the site
- User's current location identified
- Mouse scrolling is limited and aided with "top" links

Screen Layout and Aesthetic

- Text: font, size, alignment adequate for the Clinical Medical Assessment Tool
- Images support abstracts
- Color scheme contrast for legibility
- Tables used to control text and graphic layout
- Backgrounds enhance site, do not decrease legibility

Our Level 2 Evaluation: Assessing Learning

Our project is essentially a software development project, and the Clinical Medical Assessment Tool is not designed to teach specific skills. It is a tool to be used by the professor to collect data towards the assessment of learning. The items stated below are data collection points and reports to be used by the professor towards assessment.

Data Collection Points:

- Initial diagnosis of standardized patient
- Initial treatment plan (if any)
- Initial test orders (if any)
- Level of confidence in initial diagnosis/treatment plan
- Evaluation of research abstract
- Identification of researchable question
- Search terms for researchable question
- Final diagnosis of standardized patient
- Final treatment plan (if any)
- Final test orders (if any)
- Level of confidence in final diagnosis/treatment plan
- Explanation of change in diagnosis/treatment plan (if any)

Possible Reports Generated by the Clinical Medical Assessment Tool:

- Validity/importance ratings 1- 5 of abstracts
- “By student” – one student’s responses to all abstracts read
- “By abstract” – all students’ responses to one abstract
- “By patient” – all students’ responses to the same patient
- Summary reports
- Detail reports

Reflection

This project gave me valuable hands-on experience on working with a software project that would allow our client to perform assessment analysis on her students. Our project was not a normal instructional design project, but more of a piece of the instructional process that will provide for additional assessment. Our project was very challenging not only for the technical pieces, but also for the dynamics of the team and working with a client that was demanding but not always available. However, I feel each person in our group contributed something of value to the final product that we delivered to the client. Over all, I think the client is happy with what we delivered, and will be able to use the tool for detailed analysis of the data she collects with the Clinical Medical Assessment Tool.

ILT Competencies Met

Reflective Practice

This project allowed me to apply the instructional design skills and research skills of the ILT program to help guide the process of creating the assessment tool. I also learned valuable lessons of how to work on teams and relate to clients.

Planning and Analysis

There was extensive planning and analysis done for this project. Since this project was a software project tool for the assessment of students, our planning and analysis were critical for the tool to work properly. The Clinical Medical Assessment Tool will help collect data that the students enter, so that the professor can analyze their decisions.

Design and Development

Since this project was only a piece of the instructional design process, most of the design and development centered around creating a tool that would help the professor collect data to help her access the students decisions about their case. Help documentation is incorporated into the Administration tool. The web interface was designed to be easily understood and uncluttered so as not to distract the students.

Evaluation and Assessment

This project is an evaluation/assessment tool for the professor. The tool will allow the professor to gather data on the student's decisions about the case they are working on.

Implementation and Change

The teacher at her next class will implement the Clinical Medical Assessment Tool. The tool will be delivered to the client and the client trained on the use of the tool. There is also help documentation included in the tool, along with queries to run reports.

Management

This project required several management skills including project management, delivery of analysis and design documents. In addition, there were the delivery of the web interface, the help documentation, and the tool. Another area of management was the scheduling of my time for the parts of the project that I was assigned.