Design of Assessments for Knowledge Levels related to Proficiency

Assessments are an important aspect of Competency Based Education (CBE) modules. Assessments in CBE should be specifically ***designed to diagnose deficiencies*** in student learning, so that remedial instruction can be administered. To design assessments for a CBE module, we recommend that you start with assessments for declarative knowledge using simple multiple choice questions.

Step 1: Identify the noun phrase, that reflects the declarative concept that you want to design the assessment for. Make sure the concept is specific enough for the CBE module.

Example: I want to develop an assessment question for the noun phrase "*Administrative command, which adds a user account in linux*"

Step 2: Place the noun phrase in a question stem. Take care that your question does not accidentally introduce other concepts.

Example:
Which command is best used to administratively add a user account in Linux?

Step 3: Determine the correct answer and make it one of the answer choice

Example: Correct answer: ***adduser***

Step 4: Now use the following language templates to think about *what could go wrong with student learning* of this concept. State the top level learning claim as follows:

Claim: *Student has learned* X

Where X is the concept to be learned.

Now we attack this claim by introducing doubts, which challenge our belief that this claim is actually true. We call these rebuttals:

Rebuttals: *Unless the student believes* Y

Where Y is the incorrectly understood concept learned and applied.

Y becomes an answer choice for the question.

We start such descriptions using the phrase UNLESS.

Example:

Claim: *Student has learned* the **adduser** command to administratively add users in linux

Rebuttal 1: *Unless the student believes* the **useradd** command to do this which only sets the username and does not offer any other options.

Rebuttal 2: *Unless the student believes* the **usermod** command which actually modifies the account instead of adding it

Rebuttal 3: *Unless the student believes* the **net user** command, which is valid only in Windows command line to add a user.

Step 5: Continue developing rebuttals and include all resulting distractors in the final question form. Add E as an option for lack of knowledge on the concept. Add the correct answer as option A. The survey engine will randomize these later.

Example:

Which command will you use to administratively add a user account in Linux?

A. adduser
B. useradd
C. usermod
D. NET USER
E. Do not know

Step 6: For each question, ask the student for their confidence in the selected answer. The confidence measure will be used to further classify the response as:

- Insufficient understanding (Low confidence, correct answer)
- Misunderstanding (Low confidence, wrong answer)
- Misconception (High confidence, wrong answer)
- Complete understanding (High confidence, correct answer)
- Lack of knowledge (Option E chosen)