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Using critical reflection as an applied learning technique among online emergency services students

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Non-traditional students in an online introductory course in Homeland Security used the DEAL model of critical reflection to describe (a) what they learned, (b) how they learned it, (c) why it matters, and (d) what they will do with what they learned. Online discussion of readings proved to be the most effective learning technique used in the course because it incorporated reflective practices and allowed application of real-life experiences.

Van Manen (1990) argued that the prescribed method for human science, in contrast to natural science involved description, interpretations, and self-reflective or critical analysis. In other words, we explain nature, but we must understand human life. This assertion seems to suggest learning strategies that expand beyond traditional pedagogies. One such strategy is critical reflection. This article describes the use of critical reflection in an online emergency services course.

Emergency management and homeland security degree programs are relatively new. While most courses are taught using traditional delivery methods in the face-to-face classroom, many programs are reaching non-traditional emergency services students by other means, including online asynchronous courses. Much can be contributed to the field by exploring the principles of applied learning, particularly as they relate to online delivery. Critical reflection has been used successfully to encourage students to apply course concepts to present and future life experiences. Critical reflection aids in the development of higher-order thinking and critical thinking skills (Ash & Clayton, 2009; Brooks, Harris & Clayton, 2010). The purpose of this article is to contribute to the educative models used for the development of practitioners in the emergency management and homeland security disciplines and to report findings from analyzing student reflective responses written while attending a university Introduction to Homeland Security course. Much can be gained by exploring and using new pedagogies and methodologies in combination with traditional approaches. In establishing a framing for analysis, the paper examines adult learning assumptions, theories of learning, reflective practice, and the relationship of theory to practice.

Adult learning methodologies. Andragogical assumption (adult learning models) may yet prove to be of great value in education, particularly in light of the changing demographics of many, if not most universities and colleges. Adult students seem to have a different learning style requiring a careful approach when using modern technology (Pelletier, 2005). This can be especially true for practitioners in the homeland security disciplines. Due to the nature of their jobs, previous training, and educational experiences, like most adult students, they have an expectation for immediate response and effect.

Also, most of the students from this group are 25 years of age or older (the nontraditional student profile) and are accustomed to being self-directed (Gibbons & Wentworth, 2001). For the nontraditional adult students, such as emergency management and homeland security practitioners, delivery of information, which does not include a way of integrating life experience into the model, may not be accepted well (Berg, 2005).

Adults usually bring a plethora of real-life experiences with them to the classroom, experiences that need to be validated and integrated into the learning process (Knowles, 1984). Malcolm Knowles introduced the concept of andragogy (adult learning) during the 1970s. Key points of andragogy include consideration of the learner's experiences, the importance of the

learning environment, the learner's readiness to learn, and the teacher as a facilitator (Brown, 2001). Kolb (1984) proposed a four-stage cycle for adult learners: (a) concrete experience, (b) reflective observation, (c) abstract conceptualization (theory building) and, (d) active experimentation or application. It is the use of Kolb's model that this paper explores in greater detail.

Theories of learning. The many psychological epistemologies deal with how learning is accomplished. Most of these have become known as the "isms" of learning. The epistemological concepts are: empiricism, nativism, rationalism, skepticism, realism, idealism, pragmatism, objectivism, and interpretivism (Driscoll, 2005). From these sprang five traditional theories of learning: behaviorism, cognitivism, humanism, social learning theory and constructivism (Merriam & Caffarella, 1999). It is the last term, constructivism that appears to have the best ties to adult learning for practitioners.

Constructivism basically holds that learning is a process of "constructing" meaning from one's experience (Merriam & Caffarella, 2007). Some of the more well-known constructivists like Piaget and Vygotsky based their works on the premise that experience has a major role in learning. Mezirow (1997), in his transformational learning theory focused on the cognitive process of reflections and that it is possible to gauge the subjective experience of the students, or the ability to construct meaning from their learning experience. It can then be posited that reflection or reflective practices could be an effective part of the adult learner's educative process. However, increasing cognitive awareness or "cognition" may not be enough. Lizzio and Wilson (2007) offer that there is theoretical argument and empirical evidence to indicate that formal (traditional) didactic classroom strategies rarely contribute to generative or metacognitive outcomes.

Metacognition has been asserted to have value in adult learning strategies. Maxfield (2008) explained it as follows:

One method of enhancing learning with the adult learner is to incorporate metacognitive practices into instruction. Metacognition has been simply defined as "thinking about thinking." It is not that simple, but gives a brief view into the process of metacognition. Cognition is the gaining of knowledge. For example, if a student is taught that $2 + 2 = 4$, then he or she has learned the answer to the problem and will be able to get it correct the next time. Metacognition, however, is the thought process (usually reflective) on how the cognition took place. If the student were to think about how he/she became cognizant of the answer, he/she may realize that a mental picture of two objects being added to two other objects was used, thereby learning that visualization is a metacognitive activity (p.26).

Bloom, Krathwohl and colleagues (1964), after many exploratory meetings with college and university examiners identified divisions (domains) within the objectives of education. They identified them as:

1. *Cognitive*: Objectives that emphasize remembering, recalling or reproducing something that has been believed to be learned. Cognitive objectives also vary from simple recall of material to combining and synthesizing new ideas and/or material.

2. *Affective*: Objectives that emphasize a feeling, an emotion, or acceptance or rejection of material. They further identified these objectives as interests, attitudes, appreciations, values, and emotional sets or biases.

3. *Psychomotor*: Objectives that emphasize motor skills (muscular), manipulation of materials and objects, or some act that requires a neuromuscular coordination.

The cognitive domain identified in their work has been extensively studied, used, and is better known as Bloom's Taxonomy. The psychomotor domain has also been studied and used in

measuring abilities and skills of learners. Unfortunately, there are far fewer studies regarding the experiences, perceptions, and attitudinal (affective domain) behaviors in the literature.

Maxfield (2009) studied the lived experiences and perceptions of nontraditional, adult college students in an asynchronous online environment and compares cognitive and affective learning. He states, "...the cognitive domain is *can do* while the affective domain is *does do*." The cognitive domain emphasizes the students learning how to do a task when requested while the affective domain is concerned with the student doing the task when it is appropriate, after understanding that he/she can do it. These domains are not independent of each other; one cannot separate the cognitive from the affective. The affective is the effect (or natural result) of the cognitive.

Maxfield (2008) posits that educators must be more aware of the affective domain (motivation, drives, and emotions) to develop or bring about achievement of cognitive behavior. He indicates that the best way to get to the affective domain is through the cognitive domain (p.146). Krathwhol and colleagues (1964) presented an affective domain continuum, which was: (a) the student is aware of a phenomenon, (b) the student is able to perceive it, (c) the student is willing to attend to the phenomenon, (d) the student responds to the phenomenon with a positive feeling, (e) the student goes out of his/her way to respond, (f) the student conceptualizes behaviors and feelings and organizes the conceptions into a structure, and (g) the structure grows in complexity as it becomes his/her life outlook. Affective learning outcomes involve attitudes, motivation, and values (Miller, 2005). Once a student has achieved "cognition" it is assumed that the student will then apply the knowledge and by process, have a change in attitude or be "affected." Krathwhol and colleagues (1964) posed an interesting question: What if the reverse was applied—using the affective domain to achieve cognition?

Krathwohl's taxonomy (1964), as it has become known, consists of five levels. They are: (a) receiving/attending (willingness to become aware), (b) responding (appreciating or internalizing), (c) valuing (accepting, preferring or becoming committed to), (d) conceptualizing/organizing (incorporating into a value system), and (e) characterizing by value (orientation toward or identification with).

Reflective practices. It is because of the aforementioned material that the authors of this paper suggest more use of reflective strategies in developing curriculum and delivering courses in the emergency management and homeland security disciplines. Reflective practices can be presented in many forums or methodologies.

Donald Schön added to, or as some would assert, created this field of study with his book, *The Reflective Practitioner* (1983). His notions of reflection-in-action and reflection-on-action are central to this effort. Boud, Keough, and Walker (1985) have described reflection as intellectual and affective activities which individuals use to explore experiences leading to new understanding. Reflection then is taking a new experience and interacting with it as a way of making sense of what has occurred (Boud, 2001).

Vygotsky's social development theory suggested that all learning takes place in a social environment and that the learner is gaining knowledge through the social structure or interaction with the social environment. Peter Jarvis' model of learning (2004), also based on social experience, suggests that through practice and experiment followed by thought, reflection, and then evaluation, a person leaves the learning experience more developed and experienced.

Merriam and Caffarella (1999) present that Jarvis posited from an experience, there are nine different routes or responses a person can make.

1. Presumption—mechanical response or a presumption that what has previously worked will work again.
2. Nonconsideration—too preoccupied with something else to even consider the

experience.

3. Rejection—a conscious choice to reject the opportunity to learn.
4. Preconscious—a person unconsciously internalizes something.
5. Practice—practice a new skill until it is learned.
6. Memorization—acquire information with which they have been presented and learn it so it can be reproduced at a later time.
7. Contemplation—thinking about what is being learned.
8. Reflective practice—similar to problem solving.
9. Experimental learning—actually experimenting on one's environment. (p. 284)

The first three responses (presumption, nonconsideration, and rejection) are choices in which no learning takes place. In the second group of three, preconscious, practice, and memorization (which Jarvis considers nonreflective) a small amount of learning will occur. The final group of three, contemplation, reflective practice, and experimental learning are considered choices of reflective and deeper learning.

Relationship of theory to practice. One area of concern for emergency management and homeland security practitioners is the movement from theory to praxis. Taylor (2006) provides observations and reflections about the practice-theory gap. Practitioners seek concrete and absolute answers while theory is much more complex. Theories should be viewed in terms of their power as analytical tools to interpret and direct practice. Informal or personal theories are as useful as formal theories. In reflecting critically about theory one should ask “what is accurate, good, or useful about this theory?” Also, “what is inaccurate, bad, or useless about this theory?”

Some effective tools for reflection that instructors or facilitators of learning can engage are:

1. Case study – By presenting the student with a case study problem and asking them to use their knowledge to create a possible solution, gives the learner an opportunity to reflect on and apply different strategies.
2. Paper writing – Writing a paper requiring some problem-solving application is an excellent way to allow the adult learner to reflect using new information as well as from their experience base.
3. Simulation – Simulating, as closely as possible to a realistic situation, allows the learner to not only reflect, but actually experiment with different approaches (which according to Jarvis is the highest level of learning).
4. Role-Playing – Role-playing is similar to simulation in that the learner is allowed the opportunity to practice in nearly realistic situations using reflection and experimentation.
5. Journaling – Having the learner record their experiences in a journal is probably one of the best ways to facilitate the opportunity of reflection for the learner. The journal serves two reflective purposes. First, it helps students to become reflective learners, recording data about reading, study habits, and attitudes. Students are also invited to write about their own personal development; that is, they can record information about their increasing knowledge, their increasing ability to identify and articulate issues and they can reflect on important decisions that they have taken since they enrolled in the program. Second, students can examine their own self-development and their own feelings of empowerment (Jarvis, 2001).

This theory to praxis concept has an important place in developing curriculum for the emergency management and homeland security disciplines. While reflection (by implication, thinking and analyzing from past experience) is vital to being prepared, it may not be enough. Hence, being able to portend or “portensive” practices (to indicate in advance; to presage) may

be equally important. Practitioners need to be able to use critical thinking and analytical skills (reflect) in combination with the ability to visualize and/or imagine (portend) future events.

In addition to portending, visualization can be an effective methodology of learning. Hubbard and Fisher (2005) provide an interesting look at how reflection can lead to visualization. Through their observations and experiences of using video clips to illustrate concepts, they reported increased student involvement in the learning process as students used reflective practices to apply concepts to movies. Their observations appeared to support a visual taxonomy developed by Rößling and Nap (2002). This taxonomy lists six levels of active engagement in visualization strategies: Level 1, no viewing: uses no visualization. Level 2, viewing: is the core form of engagement. Level 3, responding: answering questions about content. Level 4, changing: modifying the visualization to explore differences in behavior or concepts. Level 5, constructing: encourages students to create their own visualizations. Level 6, presenting: students share their visualizations to peers or an audience for feedback.

Ash and Clayton (2009) developed the DEAL model as a means of encouraging critical reflection among students. The DEAL model consists of three steps:

1. *Description* of experiences in an objective and detailed manner;
2. *Examination* of those experiences in light of specific learning goals or objectives; and
3. *Articulation of Learning*, including goals for future action that can then be taken forward into the next experience for improved practice and further refinement of learning (p. 41).

METHODOLOGY

As a final class assignment, thirty students in two sections of the junior-level Introduction to Homeland Security class prepared a three-page critical reflection about their learning experience. Students responded to the following questions modified from the DEAL model proposed by Ash and Clayton (2009).

1. What did I learn?

- Identify and explain (so that someone who doesn't know you can understand it) a principle, concept, or value that you may have developed or that you understand better from the course. (Values are the ideals, customs, or institutions of a society that you feel strongly about. These values may be positive, as cleanliness, freedom, or education, or negative, as cruelty, crime, or blasphemy.)
- Express what you have learned about the principle, concept or value in general terms, as well as in the context of the course, so that it can be applied more broadly to other areas of your life (personally or professionally) and help you in your ongoing personal growth process.
- Introduce a judgment regarding whether the principle, concept or value can serve you in your career. How would you apply the value? Is the value enduring or will it change as you grow older? How and why?

2. How did I learn it?

- Clearly connect the principle, concept or value to your specific learning activities in the course so that someone who was not involved would understand, including discussion of the positive and negative aspects of your learning experience. How did you learn about the principle, concept or value? What course activities helped you in the formation of your feelings about the principle, concept or value?

3. Why does it matter?

- Consider how what you have learned has worth over the short and long term, both in terms of your other learning activities and in terms of your life more generally.

4. What will I do in light of it?

- Set specific goals and assessable goals (that you could come back to and check on to see if they are being met) relative to this principle, concept or value over the short and long term.
- Consider the benefits and challenges associated with fulfilling these goals, especially in light of the sources of or reasons for the learning.

Ninety percent of the 300 students in the Emergency Services Administration bachelor's degree at Utah Valley University work as fire fighters, paramedics, and police. Their average age is over 25. Ninety-five percent are male. Approximately 100 students take the introductory course in homeland security each semester. Twenty percent are from out-of-state.

A modified grounded theory approach (Glasser & Strauss, 1967) was used for sorting and analysis of student responses. Responses were examined for themes. Themes and student comments were summarized in the findings. Using inductive reasoning, hypotheses (or propositions) were generated from the findings and reported in the conclusions.

FINDINGS

Initial exploration into the effectiveness of the learning strategies was undertaken through a qualitative process using current Emergency Services Administration students at Utah Valley University. The findings section reports the themes and summarizes the comments from students who critical reflected upon their learning experience in the Introduction to Homeland Security course.

1. What did I learn?

In response to the question "What did I learn?" students identified four major themes: (a) the need to prepare, adapt and prevent terrorism, (b) individual and community roles in homeland security, (c) understanding terrorism and terrorists, and (d) characteristics and traits needed by responders and citizens.

Eight of the 30 student respondents discussed the role of individuals and communities in preparing, adapting, and preventing terrorism. Individuals and communities need to be "constantly adapting ... to changing threats." Individual preparation is important in the development of "an independent self-supporting system." To protect itself, the country must prevent and reduce the effect of terrorist attacks. This can be done, wrote one student, by incorporating new technologies and systems.

An important part of preparing for and preventing terrorism is understanding individual roles in homeland security. Twelve students discussed their roles as first responders as well as the function of communities in emergencies. Before the class most students thought that the Department of Homeland Security (DHS) deals only with terrorism. They were surprised to learn that the department also has responsibility for disaster relief, cyber security, border protection, and immigration enforcement. "The need for cooperation amongst various government entities at any level in a democratic society is paramount to provide for the safety and security of a people," wrote one student. Another wrote, "Without the help and support of state and local public safety agencies we have no chance in succeeding in this battle [against terrorism]."

A third area of learning involved understanding terrorism and the relationship of organized crime in funding and committing terrorist acts. Eight students commented about the

importance of having a greater comprehension “of the political, theological, and conceptual basis around homeland security and the rise of the violent Islamic movement.” One student wrote, “My ideas about Islam [and terrorism] were based on emotion and not accurate information.” Another wrote, “Terrorist groups are not going to go away and their attacks are going to be unpredictable.” As a nation, “we need to develop ways to adapt to the changing tactics of terrorists.”

The final theme, discussed by six students, involved characteristics needed by responders and citizens in understanding terrorism. Tolerance and respect, cooperation, agency and personal responsibility were among the traits mentioned. “When we act in our daily lives for our own interest without thought of what we are causing others to deal with, we are committing kind of a social terror,” wrote one student. Another wrote, “As we provide public service to our communities, we should practice tolerance for each other and the citizens we protect. Our values should be a reflection of the democracy we preach to the world.”

2. How did I learn it?

The course was designed around 14 lessons which included readings in Homeland Security. The readings are found online at < <http://310g.on.uvu.edu/310g-readings/>>. Students read the articles, responding to questions and objectives in lesson introductions. Students were graded on their understanding of the readings by taking a multiple-choice question, timed quiz. Next students responded to questions in an online discussion for based on the readings for each lesson. Students were graded based on their initial response (250 words with references) and on two substantive responses to other students’ comments. They were required to do one major paper, describing any state and/or local homeland security policy that has helped achieve one of the strategic objectives outlined in the National Strategy for Homeland Security. The final project was to reflect upon what they learned, how they learned it, the importance of what they learned, and how they will apply what they have learned.

The analysis considered responses of 19 students to the question, “How did I learn it?” Their responses showed that the objective of encouraging critical thinking in the course was achieved. Students reported they learned more because of the reading and discussion process. Students reported that they carefully read the assignments, researched other sources, and read the discussion comments of other students, before adding their own responses. The following comments describe their learning experience:

“The real world examples and readings of current events allow for a true understanding. Initially, reading pertinent, real life accounts of current events helped bring to light that freedom is a worthwhile quest. Analyses of the readings were completed via course discussion questions. In support of true understanding, students were required to view others discussion posts and analyze them.”

“The majority of learning came from reviewing the required reading in the course and from there going on line to find case studies and examples of it in action. Through this course I have been exposed to so many different threats and different manners in which those threats present themselves....”

“For me the required readings can be difficult to understand or hard to interpret. I would always scan through the reading and then read quite a few of the other students’ posts to help me understand what I had read. Having access to the other students’ comments was very helpful to me in the fact that they were more in layman terms and easier for me to understand.”

“Reading the assignments and writing my thoughts about the subjects and concepts in this class have broadened my knowledge base. As I read comments from my classmates about each of the reading assignments, it helped me explore another point of view.”

“What was most helpful for me to learn the different concepts about Homeland Security was the discussions that I did with my fellow classmates. After reading an article I would always have my own opinions on what it meant, and how I should apply it. After reading what my other classmates had posted helped me to get a different perspective on the subject. I feel that this really helped me to understand a lot more about what each article was actually trying to say.”

“I started to feel that personal freedoms are extremely important early on, when reading the Constitution, and the Bill of Rights. As I read from our founding fathers and learned how much they believed in the idea of each person having certain freedoms, I realized how much they should be protected and not taken lightly. The idea [of personal freedoms] would keep coming up in our class discussions, a few times early on in the class but quite a bit towards the end.”

3. Why does it matter?

Students frequently referred to their learning in responding to the question “Why does it matter?” They also identified values that made their learning activities worthwhile. Twenty student comments were analyzed in response to this question.

For one student the course encouraged her to “think outside the box.” Another student felt the course helped her “embrace new ideas and try new options.” The readings helped another student become “intelligently informed.” A fourth student wrote that the course helped him “understand the role of governments in preparing for and responding to natural and man-made disasters.”

Other comments included: “Through understanding, knowledge, and learning we create an educated department of professionals who take great passion and pride in service to people and in keeping them safe.” And, “No one policy can protect us from every future threat. Only through adaptation will we always be able to keep our homeland secure.”

“Values and ethics are an important part of public service,” wrote one student. Another student identified respect and trust as important values. One of the rewards, a student learned, was that “the benefits to citizens we serve will far outweigh the challenges.” A student indicated, “One of the worst things to have to witness or experience would be seeing my wife and children suffer because of unpreparedness.” Another felt responsible for learning of others. “Ultimately the values learned will be modeled in my life and transmitted to those that surround me,” he wrote.

4. What will I do in light of it?

Twenty-four student comments were analyzed in response to the question “What will I do in light of it?” Students were asked to set specific and assessable goals when responding to the question, ones that they could come back to and check on to see if they were being met. However, few of the goals were truly specific or measurable. The goals centered around four themes: keeping informed, being prepared, helping others be prepared, and improvement or direction.

Six students wrote that they would keep better informed because of their learning. One student wrote, “I would hope to maintain awareness and develop some mechanisms for myself and the group in which I work to understand the time to act against terrorist threats.” Another indicated that he planned “to continue to find, read and study information” to help him as an emergency responder and manager. He also wanted to help educate the public “that they also have a responsibility to prepare for natural and man-made disasters.”

A total of nine students mentioned preparedness as their goal. Five of these saw helping others be prepared as their purpose. “I now understand that we must include preparation for terror in our training schedule,” wrote one student. Another student wrote about how he planned “to be more ready to deal with a disaster and recover from it.”

The most prominent theme was self-improvement and direction, mentioned by 13 students. One student wrote that he hoped his learning about Homeland Security would help in his career. He found “the writing exercises, reading and deadlines” have already helped him realize the goal of becoming more focused in his scholarly pursuits. Another stated that his goal was to not only improve his ability to care for officers under his command but to also help them improve “their ability to care for themselves in an emergency.” A third student wrote, “I am going to use Win-Win strategies so that I can broaden my understanding of other people and fine

more ways to make things work.” Another indicated, “I’m going to think of what the consequences and effects of decisions I make is going to have on those around.”

DISCUSSION

Non-traditional students require adult learning methodologies that account for different learning styles and recognize and validate their real-life experience (Pelletier, 2005; Knowles, 1984). Because adult learners are self-directed (Gibbons & Wentworth, 2001), online learning is particularly suitable for this group of students. Combined with critical reflection, the Introduction to Homeland Security course met the four stage cycle proposed by Kolb (1984). Students applied their experience with reflective observation to theory building and then considered how to use the learning in the work place. While traditional students are encouraged to relate their learning to future work experience, non-traditional students are able to apply their work experience to their learning. The knowledge brought by non-traditional students enriches the learning situation for all students. In the Introduction to Homeland Security course both traditional and non-traditional students benefited from the real-life experiences shared in discussions. As one student wrote, what he learned from other student comments he was able to apply to the more theoretical readings.

In the Homeland Security course students were encouraged through discussion and critical reflection to “construct” meaning from their experiences (Merriam & Caffarella, 2007; Mezirow, 1997). The critical reflection exercise required the students think about their learning experience, thus achieving metacognition (Maxfield, 2008). Students were able to go beyond cognitive knowledge acquisition to achieve affective learning (Krathwohl, Bloom & Masia, 1964). As Maxfield (2009) suggested students were able to move beyond the *can do* of the cognitive domain to the *does do* of the affective domain. In establishing goals as part of critical reflection, many students mentioned a desire, to improve and have greater self-direction in their lives and similarly to help others. As students achieve affective learning, it is likely that they also feel greater satisfaction with their experience.

The discussion and critical reflection exercises in the Homeland Security course are both an intellectual and affective learning activities (Boud, Keough & Walker, 1985) that take experience and interacts with it in a way that makes sense of what has occurred (Boud, 2001). Students are able to achieve “deeper” learning as Jarvis (2004; Merriam & Caffarella, 1999) suggests through contemplation, reflective practice, and experimental learning. As a form of journaling, discussion and critical reflection helps students become reflective learners and examine their own self-development and feelings of empowerment (Jarvis, 2001). Reflection encourages “portensive” practices and visualization (Hubbard and Fisher). Students reported thinking “outside the box” and embracing new ideas and trying new options as they reflected on their learning and thought about how they learned. They gained greater understanding and became more “intelligently informed.”

CONCLUSION

Using these tools and methodologies may prove to be the most effective strategies for developing thoughtful and effective emergency management and homeland security practitioners. The following propositions related to learning practices are suggested from the discussion of findings:

- Traditional students apply their learning to work experience; non-traditional students apply their experience to learning.
- By encouraging metacognitive practices, students can increase learning as they think about how they learn.
- Once a student attains “cognition,” true learning occurs as they have a change in attitude or are “affected” by the understanding.
- Students perceive greater learning and satisfaction when “affective” learning occurs.
- Online education of adults requires “affective” learning to be successful.
- Reflection needs to go beyond analysis of past experiences to presage future events. This is called “portensive” reflection.

This study suggests the value of the DEAL approach to critical reflection both as a learning tool and a form of assessment. The DEAL approach makes students aware of the metacognitive processes they are using to learn. Among the most effective in this course was the use of discussion. Students found that as they discussed their readings and the course concepts they gained better understanding of the material and its applications. Discussion also encouraged independent learning. Students took control of their learning, involving freely in discussion with each other and extending their research when they were uncertain of information. As a form of assessment, the DEAL approach provided feedback to the instructors about the student experience as well as information about what and how much students were learning.

When practitioners return to school, they come with different expectations than the traditional student. They bring experiences that they can apply to the course concepts and materials. They learn differently and want this taken into account in their course work. Critical reflection allows them to apply their experience to their learning and takes into account their different learning style.

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