

A Model for Teaching Critical Thinking

by

Marnice K. Emerson

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## Abstract

In an age in which information is available almost instantly and in quantities unimagined just a few decades ago, most educators would agree that teaching adult learners to think critically about what they are reading, seeing, and hearing has never been more important. But just what is critical thinking? Do adult learners agree with educators that there is a need to think critically? What types of skills does a critical thinker possess? Can these skills be taught? If so, what are some strategies that educators can use to teach these skills? The purpose of this paper is to attempt to answer these questions before concluding with a proposed model of best practices for teaching critical thinking to adult learners.

*Keywords:* critical thinking, adult education, teaching critical thinking skills

In an age in which information is available almost instantly and in quantities unimaginable just a few decades ago, most educators would agree that teaching adult learners to think critically about what they are reading, seeing, and hearing has never been more important (Brookfield, 2005; Connor-Greene & Greene, 2002; Dunn, Halonen, & Smith, 2009; Halpern, 2009; Johanson, 2010). But just what is critical thinking? Do adult learners agree with educators that there is a need to think critically? What types of skills does a critical thinker possess? Can these skills be taught? If so, what are some strategies that educators can use to teach these skills? This paper will attempt to answer these questions before concluding with a proposed model of best practices for teaching critical thinking to adult learners.

### **Critical Thinking Defined**

While the plethora of information may have prompted a surge of urgency among educators to teach critical thinking skills to adult learners in the past two decades (Halpern, 2009; Kurfiss, 1988), critical thinking is not a new concept. Nearly 2,500 years ago, Socrates philosophized on a method for intense, probing questioning aimed at analyzing and evaluating ideas commonly believed to be true but that often had little to no scientific merit (Hecht, 2004). In the early twentieth century, John Dewey (as cited in Broderick & Blewitt, 2010) established the idea of reflective thinking and examining one's own beliefs as well as putting scientific inquiry at the forefront of questioning both self and others. In the middle of the twentieth century, the term *critical thinking* was introduced by B. Othanel Smith (as cited in Buffington, 2007) as a process for evaluating the accuracy of information. A decade later, Robert Ennis (1985) and Richard Paul (Paul & Elder, 2006) followed up by including ideas of creative thinking and choosing the right answer based on the given information; in the eighties these authors further defined critical thinking by adding in the concepts of problem-solving and

metacognition. Gradually, these and other theorists expanded the concept of critical thinking to include evaluating different perspectives and examining the beliefs and assumptions behind those perspectives (Brookfield, 2005; Buffington, 2007; Ennis, 1985; Paul & Elder, 2006).

Building on these foundational concepts, the following are some of the contemporary definitions of critical thinking offered by different scholars:

- “Reflective and reasonable thinking that is focused on deciding what to believe or do” (Ennis, 1985, p. 45).
- “The propensity and skills to engage in activity with reflective skepticism focused on deciding what to believe or do” (Halonen, 1995, p. 76).
- “The process of unearthing, and then researching, the assumptions one is operating under, primarily by taking different perspectives on familiar, taken-for-granted beliefs and behaviors” (Brookfield, 2005, viii).
- “The art of thinking about thinking in order to make thinking better” (Paul & Elder, 2006, p.xvii).

Synthesizing these definitions, it would seem that whether the focus is on self or others, critical thinking is about digging deeper and questioning what is offered on the surface (Downing, 2008; Ellis, 2009). However, the ability to dig deeper and question is not an innate trait in most people (Broderick & Blewitt, 2010; Kitchener, & King, 1981; Paul & Elder, 2006). By nature, people tend to feel first and think second; this process generally leads to perceptions and thinking being shaped by emotions rather than critical thought (Bussey & Bandura, 1999; Crain, 2005; Edman, 2009). Therefore, critical thinking must also be about the ability to identify emotions and then separating these emotions from the process of digging deeper and questioning (Paul & Elder, 2006).

### **Educators and Learners: Do They Agree on the Need for Critical Thinking?**

Educators of adult learners observe this emotional thinking on a daily basis (Buskist & Irons, 2009; Ellis, 2009; Wade, 2009). Manifesting itself in ways such as stereotyping, all-or-nothing beliefs, conformity, group-think, and jumping to conclusions, emotional thinking quite often blocks the ability to critically think about most topics (Brookfield, 2005; Kassin, Fein, & Markus, 2008; Paul & Elder, 2006). Couple emotional thinking with a barrage of information of questionable quality obtained from television and the Internet, and it is easy to understand why educators perceive a strong need to teach their students the whys and how of critical thinking (Buffington, 2007; Wade, 2009). As Connor-Greene and Greene (2002) posit, “Critical thinking is not an academic fad; it is an essential skill for living in the information age” (p. 324).

Unfortunately, students often resist the concept of critical thinking (Buskist & Irons, 2009). Some students perceive critical thinking as a difficult process that does not yield benefits that outweigh the effort (Kurfiss, 1988; Lawrence, Serdikoff, Zinn, & Baker, 2009). Others do not want to discover information that might make them question their existing beliefs or introduce gray areas in which there is no right answer (Buskist & Irons, 2009; Halpern, 2009). Still others do not have confidence in their ability to critically think and would prefer to rely on the thinking of those whom they perceive as expert or authority figures (Buskist & Irons, 2009; Connor-Greene & Greene, 2002).

Educators understand that critical thinking is indeed a difficult process (Halpern, 2009; Wade, 2009); as Henry Ford once said, “Thinking is hard work, and that’s why so few people do it” (as cited in Kurfiss, 1988, p. xv). However, educators must find ways to overcome resistance to the process in order to arm students with the tools needed to make informed decisions, see new possibilities, minimize prejudice by maximizing understanding, and contribute wisely and

effectively to a global society (Brookfield, 2005; Halpern, 2009; Kassin et al., 2008; Paul & Elder, 2006; Wade, 2009).

One way to overcome this resistance stems from educational motivation theories which suggest that learners generally need to be motivated to exert extra effort that difficult processes, such as critical thinking, may require (Driscoll, 2005; Huett, Kalinowski, Moller, & Huett, 2008; Keller, 2006; Weiner, 1979, 1990). Additionally, according to expectancy-value theory, learners will be more likely to exert this extra effort when they see a value or benefit to be gained (McConnell, Hoover, & Sasse, 2001). By helping learners discover how the process of critical thinking has relevance to their personal lives (i.e., better decision making with fewer substantial mistakes), and what the personal consequences might be if they do not think critically (i.e., vulnerability to con-artists), educators have the opportunity to get learners to concur that the skills involved in critical thinking are a necessity and well worth the effort (Buskist & Irons, 2009; Connor-Greene & Greene, 2002; Lawrence et al., 2009).

### **Skills of a Critical Thinker**

The skills involved in critical thinking can easily be extrapolated from the definitions presented earlier: the ability to think reflectively and reasonably (Ennis, 2985), the ability to reflect with skepticism (Halonen, 1995), the ability to unearth assumptions (Brookfield, 2005), and the ability to think about thinking (Paul & Elder, 2006). However, to be of use to educators who need to teach these skills to their adult learners, it would be helpful to break these skills down into components that potentially minimize the perceptual difficulty generally associated with critical thinking.

Brookfield (2005) suggests that critical thinkers are able to analyze their own and others' arguments in order to challenge assumptions, recognize false inferences and logical fallacies, and

discern bias and opinions from facts and evidence. Edman (2009) concurs but adds the concept of contextualization to the analysis; who, what, where, when, and why also need to be considered. Dunn et al. (2009) build on the contextual nature by suggesting that critical thinkers should be able to evaluate issues from a variety of perspectives; they also view creative, practical, and scientific problem-solving as integral skills of critical thinkers. Cotter and Tally (2009) and Paul and Elder (2006) frame the entire act of critical thinking as a metacognitive process, and suggest that just becoming aware of and thinking about one's own thinking can improve a person's ability to evaluate arguments and challenge assumptions in others. Agreeing with the other theorists, Wade and Tavris (as cited in Wade, 1997) believe that critical thinkers should use metacognition, challenge assumptions, and analyze arguments contextually; they also add that critical thinkers should avoid reasoning based on emotions and be willing to accept that there may frequently be uncertain conclusions. Appleby (2006) suggests that critical thinking skills should reflect Bloom's Taxonomy and build from lower level thinking such as retention and comprehension to higher level thinking such as application, analysis, synthesis, and evaluation.

While compiling a list of the desirable skills of a critical thinker is somewhat helpful to educators, it is only the first step toward helping facilitate these skills in adult learners. The next step is to determine if these skills can be taught, and if so, how.

### **Teachable Skills?**

Is it possible to teach critical thinking skills to adult learners? Can they be shown how to dig deeper and recognize logical fallacies, distinguish fact from opinion, uncover assumptions, and separate emotions from reasoning? Given the abundance of scholarly literature on how to teach critical thinking skills, it would seem that there are many theorists who would answer, yes

it is possible (Brookfield, 2005; Buskist & Irons, 2009; Connor-Greene & Greene, 2002; Cotter & Tally, 2009; Dunn et al., 2009; Halpern, 2009; Johanson, 2010; Lawrence et al., 2009; McKeachie & Svinicki, 2006; Paul & Elder, 2006). However, what is perhaps even more convincing to the argument that it is possible to teach critical thinking skills to adult learners is the preponderance of research providing evidence that it can be done, and can be done successfully. Experimental research (i.e., Bensley, Crowe, Bernhardt, Buckner, & Allman, 2010; Bensley & Haynes, 1995; Penningroth, Despain, & Gray, 2007) has suggested that *explicitly* teaching thinking skills improved adult learners' abilities to critically analyze course content and arguments. Additional experimental studies (i.e., Gray, 1993; Greenlaw, 2003; Yang, 2008) suggested that *implicitly* teaching thinking skills also improved adult learners' abilities to critically analyze content and arguments. In fact, a meta-analysis of over 1,300 experimental studies from 1960-2005 (Abrami et al., 2008) showed that, overall, instruction that included critical thinking components, whether delivered implicitly or explicitly, improved learners' critical thinking skills. It seems clear that information from theorists and data from the research are in concurrence: Teaching adult learners critical thinking skills is possible and does work to improve thinking.

### **Strategies for Educators**

Once it is accepted that critical thinking skills can be taught to adult learners, it is important to examine how educators can teach these skills. In their meta-analysis, Abrami et al. (2008) discovered that certain instructional strategies did appear to be slightly more effective than others at improving critical thinking skills. The authors borrowed Ennis' (1989) typology of critical thinking and categorized instructional strategies in four ways: (a) a mixed approach, in which critical thinking was taught as a separate unit within a course of other content; (b) an

immersion approach, in which critical thinking was a by-product of instruction; (c) a general approach, in which critical thinking was taught as the explicit course outcome; and (d) an infusion approach, in which critical thinking skills were embedded into the course content and explicitly stated as an outcome (Abrami et al., 2008). For example, in an introductory instructional design course, a mixed approach would involve a separate unit on critical thinking skills, isolated from the subject-matter of instructional design. In that same instructional design course, an immersion approach would involve a discussion on a contentious topic, such as instructivism versus constructivism (see Sweller, Kirschner, & Clark, 2007, for complete discussion), and the act of digging deeper for assumptions and analyzing the topic from multiple perspectives would simply occur as the topic was being explored. An example of a general approach would be a completely separate course on critical thinking skills. Finally, an infusion approach in an instructional design course would involve the explicit instruction of critical thinking skills being directly applied to the subject-matter of instructional design (i.e., “This is how to distinguish causation from correlation when evaluating whether the instructional strategy caused the outcome, or was merely correlated with the outcome”) (Ennis, 1989).

Abrami et al.’s (2008) meta-analysis revealed that the mixed method approach, in which critical thinking skills were explicitly taught as a separate unit but within a topical course, seemed to have the largest impact on improving learners’ critical thinking skills. The immersion approach, in which critical thinking skills were implicitly taught as simply a by-product of content instruction, had the smallest impact – although still a positive impact on thinking skill development. Research on the other two approaches, the general and the infusion, in which instruction of critical thinking skills was also explicit, also suggested a positive impact on learners’ critical thinking skills, yielding moderately more improvement than the implicit

instructional strategies. Abrami et al. summarized that research from over 1,300 studies suggested that explicit instruction of critical thinking skills appeared to be a more effective method than implicit instruction when teaching those skills to adult learners.

Beyer's (2008) summary of critical thinking research corroborated the findings of Abrami et al.'s (2008) meta-analysis. Explicit or direct instruction of critical thinking skills was more effective than implicit instruction at improving those skills (Beyer, 2008). Beyer contended that direct instruction of how experts apply critical thinking skills could "accelerate skill mastery by minimizing novices' development of dysfunctional [thinking] skill procedures" (p. 225) – a contention that has been supported by other researchers on expert versus novice behavior (Ertmer et al., 2008; Hardré, Ge, & Thomas, 2006; Rowland, 1992).

Given that the research provides evidence that educators should use explicit instruction when teaching critical thinking skills to their adult learners, the next step is to identify specific instructional strategies that will not only teach the skills, but also teach learners how and when to use the skills (Bensley et al., 2010; Halpern, 2009). Recall that learners need to be motivated to put forth the extra effort that critical thinking requires by understanding what is in it for them to think critically – or what they will be risking by not thinking critically (Buskist & Irons, 2009; Connor-Greene & Greene, 2002; Lawrence et al., 2009). Additionally, instructional design research (Gagné, 1985; Keller, 1987a) suggests that learner motivation is activated by gaining the learner's attention. Two strategies that have been successfully used to get learners interested in what critical thinking can do for them are surprise and disequilibrium, both of which activate self-referential thinking, or finding personal relevance (Edman, 2009; Lawrence et al., 2009; Mason & Budge, 2011).

The first attention-getting strategy in teaching critical thinking skills to adult learners is introducing the element of surprise. Surprise can be elicited by the Barnum effect, which is the tendency to believe statements are about the self when they could easily apply to anyone (Lawrence et al., 2009; Mason & Budge, 2011); as P. T. Barnum put it, “There’s a sucker born every minute” (as cited in Beins, 2000, p. 151). Studies (Baillargeon & Danis, 1984; Beins, 2000; Boyce & Geller, 2002; Emery & Lilienfeld, 2004; Lawrence et al., 2009; Miserandino, 2006; Wyman & Vyse, 2008) have shown that when participants completed some type of personality assessment and were given generic results, they believed the results were personal to them. When it was revealed that the results were merely a “one-size fits all personality description” (Lawrence et al., 2009, p. 26), adult learner participants become motivated to learn about and begin using critical thinking skills.

A second attention-getting strategy for educators to use with their adult learners is placing their learners in a mild state of disequilibrium. Defined by developmental theorist Piaget (as cited in Driscoll, 2005), disequilibrium is “an imbalance between . . . current cognitive structures and new information to be assimilated” (p. 215). Research (Attard, 2008; Edman, 2009; Lawrence et al., 2009; Sandi-Urena, Cooper, & Stevens, 2011; Siller, 2001; Zygmunt-Fillwalk, 2009) has suggested that challenging learners’ current beliefs placed them in a conflicted mindset. For example, educators can begin with a presentation of a number of commonly held beliefs in the content area of the course (beliefs that most learners typically have) and then ask learners to rate the validity of the beliefs before disclosing the research that suggests the beliefs are really myths; adult learners then become ready to resolve this conflicted mindset and become motivated to begin applying critical thinking skills to avoid future disequilibrium (Edman, 2009; Lawrence et al., 2009).

Surprise and disequilibrium can continue as the educator begins to weave in explicit instruction of critical thinking skills. For example, educators can explain how and when they would employ the skill of discerning fact from opinion or truth from fiction by modeling through a think aloud process – the next instructional strategy. Research (Bensley et al., 2010; Beyer, 2008; Buskist & Irons, 2009; Paul & Elder, 2006) has suggested that using a think aloud approach to model a behavior was an effective strategy for teaching expert behavior. Additionally, this same research provided evidence that when learners were given an opportunity to apply that same behavior – the instructional strategy that should immediately follow the modeling – learning was higher. Instructional design theorists corroborate this principle by positing that practicing a skill is an integral part of instruction, leading to significantly higher retention and transfer learning (Gagné, 1985; Huitt, Monetti, & Hummel, 2009; Lindsey & Berger, 2009; Merrill, 2009). As an example, an instructor might think aloud how they would use basic questioning strategies to evaluate a specific credible website, separating factual elements from opinions. The learners would then be given an opportunity to apply those strategies on an assignment in which they repeated the website evaluation process on their own. Assigning the learners a different website – one that appears to be credible, but this time is actually not – affords the opportunity to add in additional surprise and disequilibrium. After the learners completed the assignment, the instructor would model how *they* would evaluate the credibility of that second website through a think-aloud process; the learners would discover that they must dig even deeper than the first modeling demonstrated. This process serves two critical purposes: it further motivates the learners to see the need for critical thinking in their lives (i.e., they do not want to be fooled again) (Buskist & Irons, 2009; Connor-Greene & Greene, 2002;

Lawrence et al., 2009), and it presents critical thinking skills in increasing difficulty, rather than all at once.

Learners already understand that critical thinking is more difficult than the superficial thinking they may have been doing in the past (Kurfiss, 1988; Lawrence et al., 2009; Paul & Elder, 2006). An additional effective instructional strategy would be to teach critical thinking skills in stages, so that learners' thinking evolves from novice to more expert-like without experiencing cognitive overload (Klatzky, 1980). In addition to avoiding a feeling of overwhelm in which cognitive structures might shut down, research (Dunn et al., 2009; Edman, 2009; Ennis, 1989; Yang, 2008) suggests that when instructors model metacognition, or how they think about thinking, with increasing levels of complexity and in a variety of contexts, learners will also begin to observe that critical thinking skills have a contextual element; i.e. different types of content require different types and levels of critical thinking skills. As with the first modeling exercise, instructors should follow-up each level of metacognition with opportunities for learner applications (practice) in order to maximize retention and transfer of those skills (Beyer, 2008; Gagné, 1985; Huitt et al., 2009; Lindsey & Berger, 2009; Merrill, 2009).

An additional instructional strategy that research (Golding, 2011; Greenlaw, 2003; Wass, Harland, & Mercer, 2011; Yang, 2008) has shown to be effective for teaching critical thinking skills is the process of instructors offering reflective feedback on learners' practices of their thinking skills; a strategy also widely supported by instructional design theorists for maximizing transfer learning (Gagné, 1985; Huitt et al., 2009; Lindsey & Berger, 2009; Merrill, 2009).

While there are many methods for providing feedback, two strategies in particular have received research attention in the area of teaching critical thinking skills: scaffolding (Beyer, 2008; Paul & Elder, 2006; Wass et al., 2011) and Socratic dialoging (Golding, 2011; Greenlaw, 2003; Yang,

2008). Feedback using scaffolding offers instructors the opportunity to shift learners' zone of proximal development, a move from what they can presently do without help to what they can do with gradually decreasing guidance (Vygotsky as cited in Driscoll, 2005; Wass et al., 2011). When instructors employ a Socratic dialog feedback strategy (i.e., "Why?," "What makes that true?"), learners begin to increase their awareness of hidden assumptions as the instructor helps them question supposed concrete assertions and what might have led a person to those suppositions; as the dialog continues, learners' critical thinking skills improve, as does their ability to transfer those skills to new contexts (Golding, 2011; Greenlaw, 2003; Knezic, Wubbels, Elbers, & Hajer, 2009; Yang, 2008).

### **A Model of Best Practices**

A model is a visual representation of any tangible or intangible structure (Dick, Carey, & Carey, 2009; Gustafson & Branch, 2002; Pashke, 2003). In the field of instructional design, models are "typically a result of the combination of abstract principles . . . and analyses of practitioner experience" (Tracey & Richey, 2007, p. 372). In order to develop a model of best practices for teaching critical thinking to adult learners, it is important to synthesize relevant theoretical principles with the research literature on effective practices for teaching critical thinking.

A survey of the research literature has suggested that learners often resist critical thinking because it is a difficult process, learners are not confident they can perform the process, and the benefits of the extra required effort are not always perceived (Buskist & Irons, 2009; Connor-Greene & Greene, 2002; Halpern, 2009; Kurfiss, 1988; Lawrence et al., 2009). Educational motivation theorists suggest that people need to be motivated to exert extra effort in the learning process, and that learners' motivation is generally a malleable construct that can be influenced by

different instructional events or strategies (Driscoll, 2005; Huett et al., 2008; Keller, 2006; Weiner, 1979, 1990). Therefore, it seems prudent that motivational theory be at the crux of a model for teaching critical thinking skills.

When dealing with specific instructional constructs or contexts, such as the present discussion on teaching critical thinking skills to adult learners, Tracey and Richey (2007) suggest an overlay model development approach which “involves taking an existing general ID [instructional design] model and embedding an additional layer of design procedures to address [those] special concerns” (p. 386). While there are a number of motivation models, Keller’s (1987b) ARCS (Attention, Relevance, Confidence, Satisfaction) design model of instructional motivation will be used as the overlay, or framework, because it is based on the premise that adding in very specific motivational strategies throughout the instruction will produce predictable behavior – in this case, the effective use of critical thinking skills.

The guiding principle of Keller’s (1987a) ARCS design model of instructional motivation is an understanding of what motivates people. The model is based on the expectancy-value theory which posits that people’s effort levels are directly related to the value placed on the outcome as well as the confidence in the ability to reach that outcome (Kassin et al., 2008). Numerous studies (Huett et al., 2008; Lim, Morris, & Yoon, 2006; Pittenger & Doering, 2010) have validated the model as effective for improving student motivation (Curless, 2004; McConnell et al., 2001; Tuckman, 2005). The ARCS model provides a framework for the design and articulation of very specific instructional strategies for gaining and holding attention (A), showing personal relevance (R), creating confidence of success (C), and providing practice opportunities that produces satisfaction that the skills have been learned (S) (Keller, 1987b; McConnell et al., 2001).

The research literature on effective practices for teaching critical thinking to adult learners can be summarized with the acronym SMART; instructional strategies must be **S**elf-referential (Edman, 2009; Lawrence et al., 2009; Mason & Budge, 2011), include **M**etacognitive activities (Cotter & Tally, 2009; Dunn et al., 2009; Paul & Elder, 2006; Wade, 1997), present multiple opportunities for **A**pplication (Beyer, 2008; Gagné, 1985; Huitt et al., 2009), provide learners with **R**eflective feedback (Greenlaw, 2003; Lindsey & Berger, 2009; Yang, 2008), and maximize **T**ransfer of skills to different contexts (Knezic et al., 2009; Merrill, 2009; Yang, 2008).

Embedding the SMART principles into the framework of Keller's (1987b) ARCS model, reveals a new model for teaching critical thinking skills to adult learners (see Figure 1).

ARCS/SMART MODEL FOR TEACHING CRITICAL THINKING	
<b>Attention</b>	<b>Self-Referential</b> <ul style="list-style-type: none"> <li>• explicit</li> <li>• surprise</li> <li>• disequilibrium</li> </ul>
<b>Relevance</b>	
<b>Confidence</b>	<b>Metacognition</b> <ul style="list-style-type: none"> <li>• think aloud modeling</li> <li>• increasing complexity</li> </ul>
	<b>Application</b> <ul style="list-style-type: none"> <li>• segmenting and sequencing</li> <li>• increasing complexity</li> </ul>
	<b>Reflective feedback</b> <ul style="list-style-type: none"> <li>• scaffolding</li> <li>• Socratic dialog</li> </ul>
<b>Satisfaction</b>	<b>Transfer of skills</b>

Figure 1. Model for best practices for teaching critical thinking to adult learners (on the basis of Keller's (1987b) ARCS model of instructional motivation and best practice research on teaching critical thinking skills).

The first two parts of Keller's (1987b) ARCS model of instructional motivation are gaining learners' attention (A) and employing strategies that show learners how the content is

personally relevant (R) (Keller, 1987b). Synthesizing these principles with the literature on best practices for teaching critical thinking to adult learners, strategies should involve self-referential activities, beginning with explicit description of critical thinking skills, why they are important, and when they should be used (Beyer, 2008). These descriptions should be followed by surprise to gain attention and then creation of a state of disequilibrium in the learner to hold their attention and, according to expectancy-value theory (McConnell et al., 2001), help learners see the personal relevance and value of the content, motivating them to expend more effort in the learning process (Attard, 2008; Baillargeon & Danis, 1984; Beins, 2000; Boyce & Geller, 2002; Edman, 2009; Emery & Lilienfeld, 2004; Lawrence et al., 2009; Miserandino, 2006; Sandi-Urena et al., 2011; Siller, 2001; Wyman & Vyse, 2008; Zygmunt-Fillwalk, 2009).

Once attention is gained and relevance is perceived, the next part of Keller's (1987b) ARCS model is to employ strategies to promote learners' confidence (C). With a higher level of confidence, learners will put forth greater effort than they will if they perceive the task as unachievable (Smith & Ragan, 2005). Integrating confidence with the best practice literature on teaching critical thinking, instructional strategies should include metacognitive activities such as think aloud modeling of critical thinking skills that progress in complexity of skill as well as context (Bensley et al., 2010; Beyer, 2008; Buskist & Irons, 2009; Paul & Elder, 2006). Presenting the think aloud modeling in segments, and sequenced with increasing complexity, helps learners minimize cognitive load, as well as improve confidence (Mayer, 2008; Sweller, 2005). Additionally, providing multiple opportunities for learners to apply the critical thinking skills with increasing levels of complexity as well as in multiple contexts will also improve their confidence (and thus effort) (Beyer, 2008; Gagné, 1985; Huitt et al., 2009; Lindsey & Berger, 2009; Merrill, 2009). To further improve learners' confidence, instructors should provide

ongoing constructive and supportive feedback by employing scaffolding and Socratic dialog techniques – techniques that continue to build on expectancy-value theory and the idea that learners will exert more effort if they are confident in their ability to achieve the outcomes (Beyer, 2008; Golding, 2011; Greenlaw, 2003; Kassin et al., 2008; McConnell et al., 2001; Paul & Elder, 2006; Wass et al., 2011; Yang, 2008).

Finally, Keller's (1987b) model of instructional motivation proposes that strategies address learners' satisfaction (S) that the skills have been learned and can transfer to multiple contexts. Literature on best practices for teaching critical thinking proposes that an instructional approach that combines strategies of self-referential approaches, metacognition, application, and reflective feedback maximizes transfer of critical thinking skills to new contexts (Abrami et al., 2008; Beyer, 2008; Dunn et al., 2009). "For students to grow in their thinking and to transfer those thinking skills across contexts they should be able to evaluate their own and other's thinking . . . [by learning] explicit standards by which to evaluate their thinking" (Edman, 2009, p. 46).

### **Conclusion**

Learning to critically think, to dig deeper and question what is offered on the surface, is an essential skill for adult learners (Connor-Greene & Greene, 2002; Downing, 2008; Ellis, 2009). By employing best practice strategies, educators can provide their learners with tools to make better decisions, see new possibilities, minimize prejudice by maximizing understanding, and (hopefully) be able to contribute wisely and effectively to a diverse society.

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