

## Assessing the Critical Thinking Styles of International Faculty

R. Kirby Barrick<sup>1\*</sup>, Catherine A. DiBenedetto<sup>2</sup>

<sup>1</sup>University of Florida, 3630 SW 86th Street, Gainesville, FL 32611, USA

<sup>2</sup>Clemson University, 105 Sikes Hall, Clemson, SC 29634, USA

\*Corresponding author: R. Kirby Barrick

| Received: 10.06.2019 | Accepted: 25.06.2019 | Published: 29.06.2019

DOI: [10.21276/jaep.2019.3.6.1](https://doi.org/10.21276/jaep.2019.3.6.1)

### Abstract

In addition to subject matter skills, today's college students need reasoning, problem-solving and thinking skills. Therefore, faculty need to understand the importance of those skills for students and themselves. As U.S. faculty engage in working with counterparts in foreign institutions to enhance curricula, teaching, and student learning, knowing more about faculty critical thinking styles should lead to more relevant professional development in international university settings. This project utilized the Critical Thinking Inventory (CTI) to ascertain the critical thinking styles of male and female faculty at King Saud University in Saudi Arabia during five, six-hour intensive workshops on teaching and learning. The CTI is a validated measure of CT style. The 20-item inventory was administered, and results were analyzed for separate groups, male and female, which is common in the Kingdom. Higher CTI scores indicate a "seeking information" style and lower scores indicate an "engagement" style. Female KSU faculty indicated on average a slight tendency toward the seeking style. Individually, 14 of the 22 females indicated a seeking style and 8 indicated an engaging style of critical thinking. On average, male KSU faculty indicated a slight tendency toward the engaging style, with 21 of the 39 males indicating the engaging style and the remaining 18 indicating the seeking critical thinking style. As U.S. faculty engage in international programs, faculty Critical Thinking styles can be used to inform activities. Administering the CTI to students would also provide insight into student learning needs. Likewise, a better understanding of CT style for international faculty and students in the U.S. could enhance their teaching and learning.

**Keywords:** Critical thinking, professional development, teaching strategies.

**Copyright © 2019:** This is an open-access article distributed under the terms of the Creative Commons Attribution license which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use (NonCommercial, or CC-BY-NC) provided the original author and sources are credited.

### INTRODUCTION

Critical thinking has become a central focus of education [1]. Ball [2] earlier documented the emergence of policies, programs and projects in European communities regarding the efforts to develop higher level competencies. Ball defined them in a variety of ways, including the need to know how to learn and relearn in addition to the actual learning.

Hager and Kaye enumerated several reasons why people need to be better at critical thinking, including: to compete effectively for educational opportunities and jobs; creating good citizenship; being better adjusted psychologically; and performing better in the workplace. Shim and Walczak [3] summarized several studies, concluding that colleges and universities recognize their important role in promoting students' ability to think critically. Indeed, critical thinking is one of the major intellectual and practical skills that should be fostered by higher education, as reported by the Association of American Colleges and Universities [4].

Van Zyl, Bays, and Gilchrist [5] indicated that the lack of clarity regarding critical thinking in higher education is problematic. Their work centered on attempts to create instruments that effectively measure the competence of faculty in assessing critical thinking skills based on undergraduate student and faculty perceptions.

In addition to subject matter skills, today's college students need reasoning, problem-solving and thinking skills. Therefore, faculty need to understand the importance of those skills for students and themselves. As U.S. faculty engage in working with counterparts in foreign institutions to enhance curricula, teaching, and student learning, knowing more about faculty critical thinking styles should lead to more relevant professional development in international university settings.

## Conceptual Framework

### *What is Critical Thinking?*

As Shim and Walczak [3] discussed, a difficulty in teaching and likewise assessing critical thinking skills is based on the disagreement over the definition and components of critical thinking. Assessment appears to concentrate on skills tests with self-report measures, perhaps adding to the debate over definition and assessment. Perhaps more valuable to the discussion, the researchers presented a conceptual model that portrayed the role of institutional characteristics, student background characteristics, and instructional practices in formulating student perceptions of gains in their critical thinking skills.

The American Philosophical Association published a qualitative study, as reported by Facione in 1990, that defined critical thinking as purposeful, self-regulatory judgement resulting in higher levels of cognition such as interpretation, evaluation and inference. Facione also shared that critical thinking includes cognitive as well as affective skill development. In general, critical thinking is the art of thinking about thinking [6].

In proposing a definition, Facione [7] further stated that critical thinking is the process of purposeful, reflective judgment that manifests itself in giving reasoned and fair consideration to various evidences to make a sound decision. Scriven and Paul [8] included the intellectually disciplined process of actively and skillfully using higher cognitive abilities as a guide to beliefs and action. Halpern [9] described critical thinking in similar terms, including solving problems forming inferences and making decisions when thinkers are using skills that are thoughtful and effective. Brookfield in 1987 stated that critical thinking involves more than cognitive activities; critical thinking involves recognizing assumptions, justifying actions, and judging the rationality of those justifications.

Critical thinking is a concept that addresses reasonable and reflective thinking that is purposeful and goal-directed [10]. Students must be directed toward higher levels of cognition, and instructors must address this issue in today's learning environment [11]. University agricultural teacher educators should take the lead in these efforts, considering the diverse subjects and audiences with agriculture [12].

### **Critical Thinking and Learning Styles/Preferences**

Some debate exists regarding the relationship, or lack thereof, between critical thinking ability and a learner's learning style or learning preferences. Hager and Kaye [1] summarized several studies that address the issue. For example, critical thinking and decision-making may be associated with inductive and deductive reasoning while others view critical thinking as less scientific. Still others equate critical thinking with reflection. Under the assumption that critical thinking

and problem solving are similar, Kirton [13] found a relationship between critical thinking and learning style. Reflection was associated with adaptors and action was associated with innovators.

### **Critical Thinking in Teacher Preparation and Professional Development**

Hager and Kaye [1] indicated that if critical thinking skill is vital, then it should also be important in fields such as teacher preparation. They posited that little attention has been paid to critical thinking in the processes within teaching and learning; there is little known about the relationship between being an effective teacher and being a critical thinker in the subject matter. Shim and Walczak [3] reported research findings that demonstrate how formal and informal teaching practices facilitate the development of critical thinking. Rowles, Morgan, Burns and Merchant [14] concluded that experts acknowledge that critical thinking skills and concepts can be taught and learned. If faculty foster critical thinking skills as part of the curriculum, then they should have a personal understanding of what critical thinking is, offering that faculty should be prepared to teach critical thinking after they acquire a clear understanding of what it is. Halpern [15] agreed; when critical thinking instruction is done well, students think more critically and become thinkers.

### **Critical Thinking Inventory**

Researchers at the University of Florida developed the Critical Thinking Inventory (UFCTI) in an attempt to help educators identify their Critical Thinking style and consequently to utilize that understanding in their teaching [16]. Most other researchers have utilized similar instruments, primarily in describing student critical thinking abilities and relationships with other teaching and learning strategies and attributes [17-21]. Burbach *et al.*, [21] concluded that teachers can influence their students' critical thinking. Further, they posited that agricultural education instructors, including college instructors, need to provide opportunities for students to practice their critical thinking skills. Similar discussion by Lamm *et al.*, [16] included a variety of concepts regarding how critical thinking is related to other important learning strategies. They concluded that educators need to be aware of critical thinking characteristics and attend to those students who may be lacking those skills. However, most university instructors, in the U.S. and abroad, are well-trained in a specific discipline and not proficient in a broad understanding of learning, including critical thinking. Faculty must first become aware of the concept of critical thinking so they, in turn, can utilize new knowledge in improving their teaching and, therefore, student learning.

**Statement of the Problem**

In addition to subject matter skills, today’s college students need reasoning, problem-solving and thinking skills. Therefore, faculty need to understand the importance of those skills for students and themselves. As U.S. faculty engage in working with counterparts in foreign institutions to enhance curricula, teaching, and student learning, knowing more about faculty critical thinking styles should lead to more relevant professional development in international university settings. Critical thinking is a concept that addresses reasonable and reflective thinking that is purposeful and goal-directed [10]. Students must be directed toward higher levels of cognition, and instructors must address this issue in today’s learning environment [11]. University teacher educators should take the lead in these efforts, considering the diverse subjects and audiences [12]. And while a few critical thinking inventories address the assessment of student critical thinking abilities, little has been done to assess faculty abilities in this arena [5]. The best way to stimulate critical thinking in students is to have an instructor who is a critical thinker [12]. Typically, faculty teach at lower levels of cognition, which does little to promote critical thinking among their students [21]. Additional research is needed to examine what teaching strategies lead to increasing student critical thinking. For example, problem-based learning can help develop critical thinking skill [19].

**Purpose**

The purpose of the study was to ascertain the critical thinking preferences of university faculty in a foreign institution. Specifically, the project was designed to determine the critical thinking styles of the faculty and to compare the men and women faculty on the measure, utilizing the Critical Thinking Inventory (UFCTI) to ascertain the critical thinking styles of male and female faculty.

**METHODOLOGY**

This study was conducted at King Saud University (KSU) in Riyadh and King Faisal University in Al-Ahsa, the Kingdom of Saudi Arabia. Faculty from across the two universities participated in workshops focused on curriculum and teaching and learning. Men and women faculty attended separate but similar workshops. The instrument was administered in person using a paper form; no instruction related to critical

thinking occurred in the workshops prior to the inventory administration.

The UFCTI is a validated measure of CT style [10]. The 20-item inventory was administered to the groups separately, and results were analyzed for separate groups, male and female, which is common in the Kingdom. The instrument allows participants to be described as those Seeking Information and those of Engagement [22]. The inventory measures critical thinking style rather than skill on a continuum from seeking to engaging. According to the developers, people who score higher on the Seeking Information side of the scale are aware of their own predispositions and biases and recognize their current opinions and positions have been influenced by his or her environment and experiences. They are “hungry learners,” open to the opinions of others and take care to seek out divergent points of view. Seekers have a desire to know the truth, even if the truth conflicts with presently held beliefs and opinions. People who score higher on the Engagement side of the continuum are aware of their surroundings and able to anticipate situations where good reasoning will be needed. They look for opportunities to use their reasoning skills and are confident in their ability to reason, solve problems, and make decisions. They are also confident communicators and able to explain the reasoning process used to arrive at a decision or problem solution.

Data were analyzed using Excel to determine frequency and percent of responses for each group on each item. Based on the UFCTI instructions, specific items referred to Seeking style and the remainder referred to Engaging styles. Engagement scores were adjusted using the formula described in the Lamm and Irani directions. In describing the UFCTI, Lamm and Irani [10] indicate that higher overall UFCTI scores (78.5 and higher) indicate a “seeking information” style and lower scores (78.4 and lower) indicate an “engagement” style.

**RESULTS AND DISCUSSION**

Seeking scores were analyzed for each of the four groups: Male and female faculty at King Saud and male and female faculty at King Faisal. As seen in Table-1, nearly all Seeking scores fell within the typical range identified by Lamm and Irani, from 35 to 60. Female faculty tended to score higher than male faculty, indicating a tendency toward a Seeking style.

**Table-1: Seeking Scores**

Faculty Group	N	Number and Percent					
		13-39	40-44	45-49	50-54	55-59	60-65
King Saud Males	38	1 (3%)	2 (5%)	6 (16%)	12 (32%)	10 (26%)	7 (18%)
King Saud Females	22	0 (0%)	0 (0%)	0 (0%)	6 (27%)	9 (41%)	7 (32%)
King Faisal Males	39	0 (0%)	1 (3%)	6 (15%)	11 (28%)	13 (33%)	8 (21%)
King Faisal Females	40	0 (0%)	1 (3%)	6 (15%)	12 (30%)	15 (38%)	6 (15%)

Note: Percents may not total 100% due to rounding. Typical range: 35-60 [10]

Engaging scores were also analyzed for each of the four groups, as seen in Table-2. All scores fell within the typical range of scores, as noted by Lamm

and Irani. Male faculty tended to score higher than female faculty, indicating a tendency toward an Engaging Critical Thinking style.

**Table-2: Engaging Scores**

Faculty Group	Number and Percent					
	N	10-19	20-24	25-29	30-34	35-40
King Saud Males	38	6 (16%)	16 (42%)	10 (26%)	5 (13%)	1 (3%)
King Saud Females	22	8 (36%)	7 (32%)	5 (23%)	2 (9%)	0 (0%)
King Faisal Males	39	6 (15%)	12 (31%)	16 (41%)	4 (10%)	1 (3%)
King Faisal Females	40	8 (20%)	15 (38%)	9 (23%)	5 (13%)	3 (7%)

Note: Percents may not total 100% due to rounding. Typical range: 10-40 [10]

Female faculty at King Saud University indicated on average a slight tendency toward the Seeking style (Table-3). Females indicated a Seeking style score of 57 and male faculty indicated a Seeking score of 53. More male KSU faculty indicated a slight tendency toward the Engaging style (25.3) than female faculty (22.9). Male faculty at King Faisal University scored higher in both Seeking style (55.1) and Engaging

style (25.1) than female faculty (54.9 and 24.9, respectively). Overall, three of the four faculty groups achieved an overall score on the UFCTI instrument above 78.5, indicating an overall Seeking style. Male faculty at King Saud university scored just below the division between Seeking and Engaging with an overall score of 78.3.

**Table-3: Styles and Total Scores**

Faculty Group	Score			
	N	Seeking	Engaging	Total
King Saud Male Faculty	38	53.0	25.3	78.3
King Saud Female Faculty	22	57.0	22.9	79.9
King Faisal Male Faculty	41	55.1	25.1	80.2
King Faisal Female Faculty	40	54.9	24.9	79.8
Possible Range		13-65	13-75	26-130

Engaging = 26-78.4; Seeking = 78.5-130

Overall the two groups of faculty in the study were similar. The overall means for both groups were very close to the dividing point on the scale between Seekers and Engagers. Within each group, there was more variability in scores among the male faculty than among the female faculty.

**CONCLUSIONS AND RECOMMENDATIONS**

Unfortunately, there are few studies available that would allow for a comparison between U.S. faculty and faculty outside the U.S. A study conducted by the Center for Public Issues Education in Agriculture and Natural Resources investigated the critical thinking skills of opinion leaders, using the UF CTI instrument [23]. The researchers reported critical thinking scores

similar to those in the Saudi Arabia study, although there were some internal differences among sub-groups. Additional study is needed to investigate critical thinking skills among broader groups to help determine what steps could be taken to improve their teaching as well as student learning. One avenue of inquiry could address the critical thinking styles of similar U.S. faculty and examine any differences between the two groups.

Gay, Terry and Lamm [24] suggested teaching practices that address different critical thinking styles (Table-4). They provide recommendations for teaching strategies that address differences in critical thinking styles.

**Table-4: Critical Thinking Styles and Teaching Strategies**

Critical Thinking Style	Qualities of Style	Recommendations for Activities that Engage by Style
Seeking Information	<ul style="list-style-type: none"> <li>Need to learn all sides of a topic</li> <li>Investigative approach to learning</li> <li>Prefer static resources for information</li> <li>Aware of own personal biases</li> <li>Attempt to make objective decisions</li> </ul>	<ul style="list-style-type: none"> <li>Incorporate lectures or video tutorials</li> <li>Make take-home resources available</li> <li>Include reflective activities, like concept mapping and journal writing</li> <li>Use memory games or have participants create presentations</li> </ul>
Engaging	<ul style="list-style-type: none"> <li>Need interaction with the concept</li> <li>Communicate ideas effectively and thrive on group discussion</li> <li>Prefer interactive resources for information</li> </ul>	<ul style="list-style-type: none"> <li>Have workshops featuring hands on experiences</li> <li>Incorporate active projects</li> <li>Encourage debate and group discussion</li> <li>Use social media as an online forum for communication and learning</li> </ul>

Adapted from Gay, Terry and Lamm, 2015 [24]

Faculty are experts in their respective fields; they know the science but by and large have not been prepared as teachers. Nothing can be more frustrating than being assigned a role for which one is not prepared to carry out. As Perry, Retallick and Paulsen [25] suggested in their study, faculty need expertise in

critical thinking and how that relates to their students' style and the teaching strategies they employ. Future faculty workshops in the Kingdom and elsewhere should focus on how faculty Critical Thinking styles can be used to inform their teaching. Administering the UFCTI to their students would also provide insight into

student learning needs. As Lamm *et al.*, [16] implied, educators should be at the forefront in assisting other faculty in utilizing what is known about critical thinking, teaching and learning.

## REFERENCES

1. Hager, P., & Kaye, M. (1992). Critical thinking in teacher education: A process-oriented research agenda. *Australian Journal of Teacher Education*, 17(2), 4.
2. Ball, C. (1989). *Towards an Enterprising Culture, A Challenge for Education and Training*. Paris: OECD/CERI.
3. Shim, W., & Walczak, K. (2012). The impact of faculty teaching practices on the development of students' critical thinking skills. *International Journal of Teaching and Learning in Higher Education*. 24(10), 16-30.
4. Association of American Colleges and Universities. (2011). *The LEAP Vision for Learning: Outcomes, Practices, Impact, and Employers' Views*. Retrieved from <http://www.aacu.org/leap>.
5. van Zyl, M. A., Bays, C. L., & Gilchrist, C. (2013). Assessing Teaching Critical Thinking with Validated Critical Thinking Inventories: The Learning Critical Thinking Inventory (LCTI) and the Teaching Critical Thinking Inventory (TCTI). *Inquiry: Critical Thinking Across the Disciplines*, 28(3), 40-50.
6. Paul, R., & Elder, L. (2006). *Critical Thinking: Tools for Taking Charge of Your Learning and Your Life* (2<sup>nd</sup> ed.) Upper Saddle River, NJ: Pearson Prentice Hall.
7. Facione, P. A. (2010). Critical thinking: What is it and why it counts. *Measured Reasons and the California Academic Press*.
8. Scriven, M., & Paul, R. (1987). *Defining critical thinking*. Retrieved from The Critical Thinking Community website: <http://www.criticalthinking.org/pages/defining-critical-thinking/766>
9. Halpern, D. F. (2014). *Thought and knowledge: An introduction to critical thinking*. New York, NY: Psychology Press.
10. Lamm, A. J., & Irani, T. (2011). *UFCTI manual*. Gainesville, FL: University of Florida.
11. Whittington, M. S. (1991). *Aspired cognitive level of instruction, assessed cognitive level of instruction and attitude toward teaching at higher cognitive levels* (Doctoral dissertation, The Ohio State University).
12. Whittington, M. S. (1995). Higher order thinking opportunities provided by professors in college of agriculture classrooms. *Journal of Agricultural Education*, 36(4), 32-38.
13. Kirton, D. (2000). *Race, ethnicity and adoption*. Open University Press.
14. Rowles, J., Morgan, C., Burns, S., & Merchant, C. (2013). Faculty perceptions of critical thinking at a health science university. *Journal of the Scholarship of Teaching and Learning*, 13(4), 21-35.
15. Halpern, D. F. (1993). Assessing the effectiveness of critical thinking instruction. *Journal of General Education*, 50(4), 270-286.
16. Lamm, A. L., Rhoades, E. B., Irani, T. A., Roberts, T. G., Unruh Snyder, L. J., & Brendemuhl, J. (2011). Utilizing natural cognitive tendencies to enhance agricultural education programs. *Journal of Agricultural Education*, 52(2), 12-13.
17. Rollins, T. J. (1990). Levels of critical thinking of secondary agriculture students. *Journal of Agricultural Education*, 31(2), 47-53.
18. Cano, J., & Martinez, C. (1991). The relationship between cognitive performance and critical thinking abilities among selected agricultural education students. *Journal of Agricultural Education*, 32(1), 24-29.
19. Burris, S., & Garton, B. L. (2007). Effect of instructional strategy on critical thinking and content knowledge: Using problem-based learning in the secondary classroom. *Journal of Agricultural Education*, 48(1), 106-116.
20. Lamm, A. J., Shoulders, C., Roberts, T. G., Irani, T. A., Snyder, L. J. U., & Brendemuhl, J. (2012). The Influence of Cognitive Diversity on Group Problem Solving Strategy. *Journal of Agricultural Education*, 53(1), 18-30.
21. Burbach, M. E., Matkin, G. S., Quinn, C. E., & Searle, T. P. (2012). The impact of preparing agriculture faculty to influence student critical thinking. *Journal of Agricultural Education*, 53(2), 1-14.
22. UFCTI. (No date). *UF Critical Thinking Inventory*. Gainesville, FL: UF/IFAS Center for Public Issues Education. Retrieved from <http://www.ufcti.com>.
23. Putnam, B. B., Lamm, A. J., & Lundy, L. K. (2017). Using critical thinking styles of opinion leaders to drive Extension communication. *Journal of Agricultural Education*, 58(3), 323-337.
24. Gay, K. D., Terry, B., & Lamm, A. J. (2015). Identifying critical thinking styles to enhance volunteer development. *Journal of Extension*, 53(5).
25. Perry, D. K., Retallick, M. S., & Paulsen, T. H. (2014). A critical thinking benchmark for a Department of Agricultural Education and Studies. *Journal of Agricultural Education*, 55(5), 207-221.