

The Relationship between Leadership Development and Critical Thinking Skills

John C. Ricketts
Assistant Professor
110 Four Towers
University of Georgia
Athens, GA
jcr@uga.edu

Abstract

The primary purpose of this correlational study was to explain the relationship between discipline specific critical thinking skills and leadership training and experiences of selected FFA youth leaders. Researcher-developed measures of critical thinking skills and leadership were used to discover low, but positive relationships between critical thinking skills and each leadership variable of leadership training, leadership experience, and total leadership score. The relationship between leadership training and Evaluation and Total Critical Thinking Skill was significant. Similarly, the relationship between leadership experiences and Analysis and Total Critical Thinking Skill was significant. Finally, the relationship between combined leadership score and Analysis, Evaluation, and Total Critical Thinking Skill was also significant. Recommendations include more student exposure to formal teaching and training in leadership, more research to substantiate the connection between leadership and critical thinking, and more encouragement for students to be more active in non-formal activities.

Introduction

Leadership development is crucial for youth on the verge of becoming productive citizens, but one of the key competencies of leadership development is the ability of those youth to make sound decisions and judgments, which incorporate critical thinking (Ricketts & Rudd, 2003). How valid is this claim? Is critical thinking related to leadership development, leadership education, or leadership status? These are the questions this study attempts to address.

Theoretical Framework

Youth Leadership Development

Studies that specifically address leadership and youth while incorporating some measure of critical thinking in their conceptualization of leadership development are limited. DesMaria, Yang, and Farzenhkia (2000) indicated certain elements that

were necessary in the development of youth leadership. They listed the critical elements as:

- Youth/adult partnerships.
- Granting young people decision making power and responsibility for consequences.
- A broad context for learning and service.
- Recognition of young people's experience, knowledge and skills.

Some such as vanLinden and Fertman (1998) believed that leaders are those who think for themselves, can communicate their thoughts and feelings effectively, and help others to understand and be able to act on their own beliefs. They also suggested leaders influence others in an ethical and socially responsible manner. Research by vanLinden and Fertman on leadership development in youth was the theoretical framework prompting the development of the Model of Youth Leadership Development (Ricketts & Rudd, 2003).

To understand the group and context being studied, Ricketts and Rudd (2003) developed the *Model of Youth Leadership Development*. Based on the research of Fertman and Long (1990), Fertman and Chubb (1993), Wald and Pringle (1995), and Long, Wald, and Graff (1996), the model demonstrated a way of fostering leadership in youth in career and technical education programs, such as agricultural education, general secondary education curricula, agricultural extension programs, and even post secondary undergraduate study. Each dimension of the conceptual model of youth leadership development suggested a curricular unit for each stage (awareness, interaction, and integration). The model recommended that the dimensions be taught on three different hierarchical levels that engage higher order thinking. The model seeks to build on the experience and perception of students in order to enhance cognition and behavior in leadership development. The five constructs or dimensions of youth leadership development in the model are:

- Leadership knowledge and information: The dimension of leadership knowledge and information represents what youth need to know about leaders and leadership before they can proceed with their application of leadership concepts.
- Leadership attitude, will, and desire: Leadership attitude, will, and desire is the dimension designed to stress the importance of disposition, motivation, self-realization, and health in fulfilling a student's leadership capacity.
- Intrapersonal and interpersonal skills: Conflict resolution, stress-management, teamwork, and ethics combined with knowledge regarding diversity, personality types, communication styles, leadership styles, and other human relations abilities all fall into the final dimension. This human relation dimension prepares students to look inward and to work with others in the most optimum ways possible.
- Oral and written communication skills: Oral and written communication skills are the media for sharing knowledge, interests, attitudes, opinions, feelings, and ideas in order to influence and ultimately lead others (vanLinden & Fertman, 1998).

- Decision-making, reasoning, and critical thinking skills: Critical thinking is a reasoned, purposive, and introspective approach to solving problems or addressing questions with incomplete evidence and information, and for which an incontrovertible solution is unlikely.

Decision-making, reasoning, and critical thinking skills as a principal component of leadership development represented the dimension which was evaluated in this study. Based upon an extensive literature review, the author determined that critical thinking research is limited in youth leadership education and findings in this area will provide the most immediate and direct benefit to the leadership education discipline.

Critical Thinking

Paul (1995) defined critical thinking as “a unique and purposeful thinking in which the thinker systematically and habitually imposes criteria and intellectual standards upon the thinking, taking charge of the construction of thinking, guiding the construction of the thinking according to [critical thinking] standards, and assessing the effectiveness of the thinking according to the purpose, criteria, and the standards [of thinking]” (p. 21). Rudd, Baker, and Hoover (2000) provided the description of critical thinking guiding this study. They described critical thinking as “a reasoned, purposive, and introspective approach to solving problems or addressing questions with incomplete evidence and information and for which an incontrovertible solution is unlikely” (p. 5).

Facione (1990), who conducted a national Delphi study of experts to define critical thinking, developed the following definition: “We understand critical thinking to be purposeful, self-regulatory judgment, which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based” (p.2).

Following the lead of Facione (2000), three critical thinking skills were the skills measured in this study – analysis, evaluation, and inference. These skills were selected to represent critical thinking skill because of their orientation to objective measurement, their indicativeness of all critical thinking skills, and because subsequent studies have been conducted to validate their usage (Facione, 1990; Jones, Hoffman, Ratcliff, Tibbetts, & Glick, 1994).

A student competent in the critical thinking skill of Analysis can effectively identify the relationship between statements, questions, concepts, or descriptions to express beliefs, judgments, or reasons. Students excelling at Inference consistently demonstrate the ability to draw reasonable conclusions and hypotheses based on facts, judgments, beliefs, principles, concepts, or other forms of representation. Finally, students competent in the skill of Evaluation can effectively assess the

credibility of statements and representations of others, and are proficient at assessing the logical strength of statements, descriptions, or questions (Facione, 1998).

Relationship between Leadership and Critical Thinking

Rollins (1990) sought to determine the critical thinking skills of high school students in Iowa, and found that held leadership positions accounted for a percentage ($r = .25$) of the variance. Another study that may have indicated the value of leadership for explaining critical thinking skills was done by Duchesne (1996). He studied ($N = 119$) organizational leaders. The only significant predictor of critical thinking in the leaders was the years of education and developmental leadership learning experiences which is really in the realm of the next variable, leadership training.

Leadership training is the variable representing the amount of formal leadership training participants received. Empirical research making the connection between critical thinking skills and leadership training does not exist. Sources dealing with the contextual nature of critical thinking may give credence to formal leadership instruction (Ennis 1989; Kintsch 1994; Anderson, 2001), but Garcia and Pintrich (1992) conducted the only known study to identify correlations between critical thinking and leadership. They specifically looked at the relationship to motivation, learning strategies, and classroom experiences. Students ($n = 758$) in 12 different classrooms in three different institutions were studied. Intrinsic goals and critical thinking were positively related.

Purpose and Objectives

The primary purpose of this correlational study was to explain the relationship between discipline specific critical thinking skills and leadership training and experiences of selected youth leaders in the National FFA Organization. To accomplish these purposes the following research objectives were used to guide this study:

- Determine the relationship between level of leadership training (FFA and/or other activities designed to develop leadership) and critical thinking skills in selected youth leaders in the National FFA Organization.
- Determine the relationship between leadership experiences (FFA activities and/or other activities, which may develop leadership) and critical thinking skills in selected youth leaders in the National FFA Organization.
- Determine the relationship between combined leadership score and critical thinking skills in selected youth leaders in the National FFA Organization.

Methods and Procedures

Since the purpose of this study was to explain the relationship between critical thinking skills and leadership training and experiences, the research design was correlational. The target population for the study consisted of the 2002 National FFA Convention delegates specifically selected because of their leadership record in

the FFA organization and status as a leader in their state, as represented by their nomination to serve as a voting delegate for the organization. A pilot test of the researcher-developed critical thinking skills test was administered to 33 subjects at the Florida State FFA Convention in Orlando, Florida. The pilot sample was purposively selected because of their similarities to the target population.

The researcher-developed critical thinking skills test measured the discipline-specific skills of analysis, inference, and evaluation (Facione, 1990). Prior to pilot testing, a panel of faculty experts in critical thinking and leadership education at the University of Florida checked the researcher-developed multiple-choice skills test for content and face validity. After pilot testing and item analysis, Cronbach's alpha for each critical thinking sub-skill was 0.83 for Analysis, 0.66 for Inference, and 0.63 for Evaluation. These reliability ratings were deemed appropriate since Norris and Ennis (1989) recommended reliability ratings of 0.65 and 0.75 for any instrument testing a variety of critical thinking aspects.

Measuring leadership is a difficult task, but based upon the research of Townsend and Carter (1983), Ricketts (1982), and Dormody and Seevers (1999), this study works within the assumption that the frequency and level of participation in FFA activities is a measure of leadership. Townsend and Carter (1983) found FFA activity participation had a positive correlation with the leadership of 12th grade students in Iowa. Similarly, Ricketts (1982) gathered data from 12th grade male students in Tennessee and found that FFA members from both superior and non-superior chapters possessed significantly more leadership and personal development abilities than students not associated with the youth leadership organization. Lastly, in an attempt to predict Youth Leadership Life Skill Development, Dormody and Seevers (1994) found a weak, but positive relationship between participation in the FFA and students' Youth Leadership Life Skills Development.

To collect data for the leadership variables, a researcher-developed instrument was used to determine leadership training score, leadership experience score, and total leadership score. To measure leadership, participants were asked to write the number of times they had participated in a given list of leadership activities that are available in the FFA. Additionally, participants wrote responses to the following two questions: (a) what other activities in the FFA, not listed above have contributed to your leadership development and (b) what activities outside of the FFA have contributed to your leadership development?

A panel of faculty experts at the University of Florida classified responses as either formal leadership training (i.e., leadership workshops, leadership conferences, or formal leadership courses) or as leadership experiences (i.e., public speaking, livestock judging, state FFA convention). An index method of scoring leadership participation inspired by Dormody and Seevers (1982) was utilized whereas Local activities were given a value of one point, District and Area activities were given a value of two, Regional activities were given a value of three, State activities were

given a value of four, and National and International activities were given a value of five. A formal leadership development course was also given a value of five.

Survey implementation followed Dillman's (2000) system of five compatible contacts. The data were collected in the Fall of 2002. There were 229 responses from a population frame of 462 possible participants for a response rate of nearly 50%. Twenty-seven of those respondents were removed from the database because of missing or erroneous data which left 202 usable responses. To account for non-response, early respondents were compared to late respondents on each of the critical thinking and leadership variables (Lindner, Murphy, & Briers, 2001; Miller & Smith, 1983) and no significant differences were found.

Data were analyzed using the SPSS[®] for Windows[™] statistical package. Pearson's Product Moment (r) statistics were conducted to identify the magnitude of relationship of critical thinking skills to the other variables in the study. The Coefficient of Determination (R^2) was used as an index of the proportion of variance in critical thinking skills explained by the independent variables.

Results

Critical thinking skill scores ranged from a low score of 67.86 to a maximum score of 300. The mean total critical thinking skill score was $M = 227.86$, $SD = 37.91$. The scores for *Analysis* ranged from a low of 25 to the highest possible score of 100. *Inference* scores ranged from 0 to 100, and *Evaluation* scores ranged from 14.29 to 100. The highest scores were recorded for the *Analysis* ($M = 82.17$, $SD = 5.12$) construct. All of the skill scores were above 70 for the possible range of 0 to 100. Students also scored in the upper range of scores for the *Inference* ($M = 73.40$, $SD = 20.74$) and *Evaluation* ($M = 71.50$, $SD = 7.70$) skills.

Objective 1 - Relationship between level of leadership training and critical thinking skills.

Leadership training scores ranged from 0 to 64, with an average score of $M = 17.11$, $SD = 9.84$. Table 1 displays critical thinking skill scores at six different levels of leadership training.

Table 1.
Mean critical thinking skill score by leadership training (N = 210)

Leadership Training Score	N	Analysis M	Analysis SD
0-9	42	81.25	13.87
10-19	98	82.36	15.10
20-29	49	84.18	17.45
30-39	15	83.33	12.20
40-49	3	91.67	14.43
50+	3	95.83	7.22
Leadership Training Score	N	Inference M	Inference SD
0-9	42	76.19	20.36
10-19	98	72.65	20.98
20-29	49	71.02	21.63
30-39	15	70.67	19.81
40-49	3	80.00	.00
50+	3	93.33	11.55
Leadership Training Score	N	Evaluation M	Evaluation SD
0-9	42	72.45	15.18
10-19	98	68.66	18.75
20-29	49	73.47	16.50
30-39	15	76.19	18.44
40-49	3	90.48	16.50
50+	3	76.19	8.25
Leadership Training Score	N	Total CT Skill M	Total CT Skill SD
0-9	42	229.89	34.40
10-19	98	223.67	38.12
20-29	49	228.67	41.39
30-39	15	230.19	34.58
40-49	3	262.15	30.93
50+	3	265.36	6.26

Note: Leadership training scores ranged from 0 to 64.

According to Davis (1971), a Pearson Product Moment correlation coefficient of 0.01 - 0.09 represents a negligible relationship; 0.10 - 0.29 represents a low relationship; and 0.30 to 0.49 represents a moderate relationship. Using Davis' terminology for magnitude of the relationship, there was a low relationship between leadership training score and each sub-skill and the total critical thinking skill score. However, the relationship was positive. Table 1 depicted a trend of higher critical thinking scores for higher levels of leadership training. Table 2 indicates that this low and positive relationship with leadership training is significant for *Evaluation*, $r(209) = 0.14$, $p < 0.05$, $R^2 = 0.02$ and total critical thinking skill score, $r(209) = .15$, $p < 0.05$, $R^2 = 0.02$, explaining only 2% of the variance for each respective variable. The positive relationship was approaching significance with *Analysis*, $r(209) = 0.14$, $p > 0.05$, and not significantly related to *Inference*, $r(209) = 0.06$, $p > 0.05$. R^2 was reported for the statistically significant relationships to determine practical significance (Miller, 1998).

Table 2.

Pearson Product Moment correlation between critical thinking skills and leadership training score (N = 210)

Skill	R	df	Sig.(2-tailed)
Analysis	0.14	209	0.06
Inference	0.06	209	0.41
Evaluation	0.14	209	0.04
Total critical thinking	0.15	209	0.03

Objective 2 - Relationship between leadership experiences and critical thinking skills.

Leadership experience scores ranged from 4 to 87 with an average score of $M = 31.25$, $SD = 12.81$. According to Table 3, the total critical thinking skill scores improved from $M = 206.28$, $SD = 29.56$ at the lowest level of leadership experience to $M = 241.01$, $SD = 42.98$ at the highest level of leadership experience.

There was also a low relationship between leadership experience score and critical thinking skills. However, the relationship was positive. Table 3 depicted a trend of higher critical thinking scores for higher levels of leadership experience. Table 4 shows that this relationship is significant for *Analysis*, $r(209) = 0.14$, $p > 0.05$, $R^2 = 0.02$ and total critical thinking skill score $r(209) = 0.16$, $p < 0.05$, $R^2 = 0.03$, explaining 2% and 3% of the respective variance in each critical thinking variable. The relationship was positive, but insignificant for *Inference*, $r(209) = 0.11$, $p > 0.05$, and *Evaluation*, $r(209) = 0.08$, $p > 0.05$, when alpha was set at 0.05.

Objective 3 - Relationship between total leadership score and critical thinking skills.

The total leadership score is an additive result of the leadership training score and the leadership experience score. Total leadership scores ranged from four to 111 with an average score of $M = 48.36$, $SD = 18.03$. Table 5 also shows an increase in critical thinking skill scores with increases in total leadership score. The lowest total critical thinking skill scores ($M = 220.19$, $SD = 34.80$) were at the 25-34 leadership score level. The highest critical thinking skill scores ($M = 240.15$, $SD = 34.60$) were at the 75+ leadership score level.

Table 3.
Mean critical thinking skill score by leadership experience (N = 210)

Leadership Experience Score	n	Analysis M	Analysis SD
0-9	4	84.38	6.25
10-19	23	76.55	11.43
20-29	81	81.92	17.67
30-39	62	84.07	13.42
40-49	24	86.98	13.02
50+	16	86.72	15.46
Leadership Experience Score	n	Inference M	Inference SD
0-9	4	60.00	23.09
10-19	23	71.30	22.42
20-29	81	70.37	23.90
30-39	62	76.77	17.06
40-49	24	75.00	16.94
50+	16	77.50	17.70
Leadership Experience Score	n	Evaluation M	Evaluation SD
0-9	4	61.91	12.90
10-19	23	67.50	13.05
20-29	81	71.96	18.52
30-39	62	71.66	17.45
40-49	24	71.43	15.19
50+	16	76.79	22.66
Leadership Experience Score	n	Total CT Skill M	Total CT Skill SD
0-9	4	206.28	29.56
10-19	23	215.35	36.24
20-29	81	224.25	42.06
30-39	62	232.51	33.10
40-49	24	233.41	30.40
50+	16	241.00	42.98

Note: Leadership experience scores ranged from 4 to 87.

Table 4.
Pearson Product Moment Correlation between critical thinking skills and leadership experience score (N = 210)

Skill	R	df	Sig.(2-tailed)
Analysis	0.14	209	0.05
Inference	0.11	209	0.10
Evaluation	0.08	209	0.23
Total critical thinking	0.16	209	0.03

There was a low relationship between total leadership score and critical thinking skills. However, the relationship was again positive. According to Table 6, this relationship was significant for *Analysis*, $r(209) = 0.17, p < 0.05, R^2 = .03$ explaining 3% of the variance; for *Evaluation*, $r(209) = 0.14, p < 0.05, R^2 = .02$,

explaining 2% of the variance; and for total critical thinking skill score $r(209) = 0.19$, $p < 0.05$, $R^2 = 0.04$, explaining 4% of the variance. This positive relationship was not statistically significant for *Inference*, $r(209) = 0.11$, $p > 0.05$ when alpha was set at 0.05.

Table 5.

Mean critical thinking skill score by combined leadership score (N = 210)

Combined Leadership Score	n	Analysis M	Analysis SD
0-24	18	80.46	13.66
25-34	21	83.93	11.28
35-49	86	79.49	17.87
50-74	70	86.61	12.65
75+	14	87.50	12.01
Combined Leadership Score	n	Inference M	Inference SD
0-24	18	72.22	25.80
25-34	21	68.71	22.43
35-49	86	71.86	21.56
50-74	70	76.00	18.84
75+	14	77.14	15.41
Combined Leadership Score	n	Evaluation M	Evaluation SD
0-24	18	70.24	12.71
25-34	21	67.69	13.85
35-49	86	70.10	19.18
50-74	70	73.67	16.43
75+	14	75.51	22.71
Combined Leadership Score	n	Total CT Skill M	Total CT Skill SD
0-24	18	222.92	38.32
25-34	21	220.19	34.80
35-49	86	221.45	40.47
50-74	70	236.28	34.87
75+	14	240.15	34.60

Note: Total Leadership scores ranged from 4 to 110.

Table 6.

Pearson product moment correlation between critical thinking skills and combined leadership score (N = 210)

Skill	R	df	Sig.(2-tailed)
Analysis	0.17	209	0.02
Inference	0.11	209	0.11
Evaluation	0.14	209	0.05
Total critical thinking	0.19	209	0.01

Discussion and Conclusions

The statistically significant positive relationship between leadership training and total critical thinking skill score could be attributed to the content of the leadership training workshops, seminars, and courses, which participants listed as contributory to their leadership development. Topics such as conflict resolution, problem-solving, and interpersonal communication seemed to be laced with scenario-based educational activities that develop a leader's ability to evaluate circumstances and make critical decisions.

The positive relationship between leadership training and critical thinking, although low, is a new finding in leadership and critical thinking studies as only one other piece of research, conducted at the University of Connecticut (Duchesne, 1996) has found a connection between leadership training and critical thinking. The connection between leadership and critical thinking seems natural and presumably necessary because leaders who do not use critical thinking as they make decisions that affect and influence others are dangerous (Facione, Facione, & Giancarlo, 1998). Facione, Facione, and Giancarlo list several ways that we can protect ourselves from leaders who lack the willingness or the ability to make good judgment, but the most important way cited was simply, educating persons to think.

Activities classified as leadership experience involved any competitive events, experiences as an officer, committee member, or any other activity in the FFA that was not a formal leadership training experience and any other activities participants listed that they believed contributed to their leadership development that was not a formal leadership training experience. Although gains in critical thinking are not as pronounced for the leadership experience variable, an examination of the total critical thinking scores demonstrates a steady increase in critical thinking skill scores at each level increase in leadership experience. This low, but positive relationship was significant for Analysis and total critical thinking skill score.

It is possible that the more leadership experiences (FFA activities) students are exposed to, the more their mind, and the skill it has for critical thought improves. Participation in contests seemed to be a major determining factor of the leadership experience variable. The competition could be the reason for improved critical thinking. The Analysis and quick thinking those contests require may also foster critical thinking.

Additionally, the leadership experience of being an FFA officer may have contributed to the leadership experience variable. One could reason that the officer experience may contribute to the relationship between total critical thinking and Analysis. One explanation for the relationship between Analysis and critical thinking might be the nature of the Analysis critical thinking construct. According to Facione (1990), Analysis involves examining ideas, identifying arguments, and analyzing arguments. Perhaps FFA officers and contest participants are engaging in

analysis types of activities as part of their responsibilities to the FFA members or competitive team.

Lastly, the high level of motivation this group of students seemed to exhibit compared to similar FFA members not a part of this sample was not accounted for in the study. Perhaps the variable of motivation may be the reason that leadership and critical thinking are related (Garcia & Pintrich, 1992). Recall that Garcia and Pintrich sought to identify correlations between critical thinking and motivation, learning strategies, and classroom experiences. Their study supported the positive relationship between critical thinking and motivation. The students in this study should be highly motivated and therefore, according to Garcia and Pintrich (1992), adept at critical thinking as well.

Recommendations

The finding that critical thinking may be related to leadership training may be important for leadership educators and leaders responsible for curriculum development. Youth need to be exposed to formal teaching and training in leadership development that directly and indirectly affect their ability to make fair, informed, judicious, and critically thought out decisions.

If the National FFA Organization (2002) believes effective leaders in their organization should be able to think critically, think creatively, practice sound decision-making, be effective problem solvers, commit to life-long learning, articulate their opinions to persuade others, practice sound study skills and maximize mental assets as well as compensate for mental limitations as the task force reports suggests, then a greater effort should be put forth to substantiate the relationship between leadership education and critical thinking. A concerted effort to teach critical thinking in leadership training could yield greater impacts on critical thinking skills.

Because of the low, but positive relationship between leadership experience (FFA activities) and critical thinking, leadership educators should begin to foster critical thinking. They should do this by encouraging students to be more active and to participate in more activities that have been proven to develop leadership (Ricketts, 1982; Townsend & Carter, 1983; Wingenbach & Kahler, 1997). This activity should include competitive events and participation as a leader within student organizations.

Lastly, more research should be conducted to gain a better understanding of the relationship between leadership and critical thinking. This future research should include more quantitative, empirical, and reliable measures of leadership than the methods used in this study. They should also investigate the impact of training leaders in critical thinking.

References

- Anderson, T., Howe, C., Soden, R., Halliday, J., & Low, J. (2001). Peer interaction and the learning of critical thinking skills in further education students. *Instructional Science*, 29(1), 1-32.
- Davis, J. A. (1971). *Elementary survey analysis*. Englewood, NJ: Prentice Hall
- DesMarais, J., Yang, T., & Farzanehkia, F. (2000). Service-learning leadership development for youths. *Phi Delta Kappan*, 81 (9) 678-680.
- Dillman, D. A. (2000). *Mail and internet surveys: The tailored design method*. (2nd ed). New York: John Wiley & Sons.
- Dormody, T., & Seevers, B. (1982). Participation of FFA members in leadership development: A tri-state study. *Journal of Agricultural Education*, 35(1), 42-48.
- Dormody, T. J., & Seevers, B. S. (1994). Predicting youth leadership life skills development among FFA members in Arizona, Colorado, and New Mexico. *Journal of Agricultural Education*, 35(2) 65-71.
- Duchesne, R. E. J. (1996). *Critical thinking, developmental learning, and adaptive flexibility in organizational leaders*. Unpublished Dissertation, University of Connecticut, Storrs, CT.
- Ennis, R. H. (1989). Critical thinking and subject specificity: Clarification and needed research. *Educational Researcher*, 13(3), 4-10.
- Facione, P. A. (1990). *Critical Thinking: A Statement of Expert Consensus for Purposes of Educational Assessment and Instruction. Research Findings and Recommendations*. (Report No. RIEJUN1990) Millbrae, CA: California Academic Press. (ERIC Document Reproduction Service No. ED315423).
- Facione, P. A. (1998). *Critical thinking: A statement of expert consensus for purposes of educational assessment and instruction: Executive Summary: The Delphi Report*. Millbrae, CA: California Academic Press.
- Facione, P. A. (2000). *The test of everyday reasoning: A measure of critical thinking skills; TER support material*. Millbrae, CA: California Academic Press.
- Facione, P. A., Facione, N. C., & Giancarlo, C. A. F. (1998a). *Professional judgment and the disposition toward critical thinking*. California Academic Press. Retrieved January 5, 2002, from the World Wide Web:
http://www.calpress.com/pdf_files/Prof_jmn.pdf

Fertman, C. I., & Chubb, N. H. (1993). The effects of a psycho educational program on adolescents' activity involvement, self-esteem, and locus of control. *Adolescence*, 27 (107), 517-526.

Fertman, C. I., & Long, J. A. (1990). All students are leaders. *School Counselor*, 37 (5), 391-396.

Garcia, T., & Pintrich, P. R. (1992). *Critical thinking and its relationship to motivation, learning strategies, and classroom experience*. Paper presented at the Annual Meeting of the American Psychological Association, Washington, DC.

Jones, E. H., Hoffman, S., Ratcliff, G., Tibbetts, S., & Glick, B. (1994). *Essential skills in writing, speech and listening, and critical thinking for college graduates: Perspectives of faculty, employers, and policy makers*. (Project Summary OERI Contract No. 117G10037). University Park, PA: US Department of Education.

Kintsch, W. (1994). Test comprehension, memory, and learning. *American Psychologist*, 49(4), 294-303.

Lindner, J. R., Murphy, T. H., & Briers, G. E. (2001). Handling nonresponse in social science research. *Journal of Agricultural Education*, 42(4), 43-53.

Long, J. A., Wald, H. P., & Graff, O. (1996). Student leadership. *Keystone Leader*, 29 (1), 21-24.

Miller, L. E. (1998). Appropriate analysis. *Journal of Agricultural Education*, 39(2), 1-10.

Miller, L. E., & Smith, K. L. (1983). Handling nonresponse issues. *Journal of Extension*, 21, 45-50.

National FFA Task Force on Leadership and Personal Success (2002). *The cognitive and intellectual development that allows for the effective application of reasoning, thinking, and coping*. Unpublished manuscript, 6060 FFA Drive, Indianapolis, IN.

Norris, S. P., & Ennis, R. H. (1989). Evaluating critical thinking. In R. J. Swartz and D. N. Perkins (Ed.), *Teaching thinking*. Pacific Grove, CA: Midwest Publications.

Paul, R. (1995). *Critical thinking: How to prepare students for a rapidly changing world*. Santa Rosa, CA. Foundation for Critical Thinking.

Ricketts, S. C. (1982). *Leadership and Personal Development Abilities Possessed by High School Seniors Who are FFA Members in Superior FFA Chapters, Non-superior Chapters, and by Seniors Who Were Never Enrolled in Vocational Agriculture*. Unpublished doctoral dissertation, The Ohio State University, Columbus, OH.

Ricketts, J. C., & Rudd, R. D. (2003). A comprehensive leadership education model to train, teach, and develop leadership in youth. *Journal of Career and Technical Education*, 19 (1), 7-17.

Rollins, T. J. (1990). Levels of critical thinking of secondary students. *Journal of Agricultural Education*, 31 (3), 47-53.

Rudd, R., Baker, M., & Hoover, T. (2000). Undergraduate agriculture student learning styles and critical thinking abilities: is there a relationship? *Journal of agricultural education*, 41(3), 2-12.

Townsend, C., & Carter, R. (1983). The relationship of participation in FFA activities and leadership citizenship, and cooperation. *Journal of the American Association of Teacher Educators in Agriculture*, 24 (1) 20-25.

vanLinden, J. A., & Fertman, C. I. (1998). *Youth leadership: A guide to understanding leadership development in adolescents*. San Francisco, CA: Jossey-Bass Publishers.

Wald, H. P., & Pringle, J. L. (1995). *A report on the evaluation of the Mt. Lebanon Chemical Dependency Prevention Project for 1994*. Pittsburgh, PA: St. Francis Medical Center.

Wingenbach, G. J., & Kahler, A. A. (1997). Self-perceived youth leadership life skills of Iowa FFA members. *Journal of Agricultural Education*, 38 (3), 18-27.

Biography

John C. Ricketts is an Assistant Professor and the Coordinator of Agricultural Education at the University of Georgia. John teaches and advises undergraduate and graduate students in agricultural leadership, education, and communication. He is a graduate of the University of Florida (Ph.D.) and Middle Tennessee State University (M.S. and B.S.). Prior to his career in higher education John was a high school Agriculture teacher in Tennessee. John's research focuses on student achievement, and he believes that student skills in leadership and critical thinking are key achievement variables.