

# **Report on Critical Thinking Assessment**

**Fall 2020 Semester**

**Southwest Virginia Community College**

**Critical Thinking Assessment Team**

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**February 3, 2020  
(Revised June 14, 2021 and August 27, 2021)**

## **Contents**

I. Critical Thinking Assessment Plan and Modifications	3
--SWCC's Definition of "Critical Thinking"	
--Assessment Plan and Pandemic Modifications	
II. SWCC Critical Thinking Assessment Test ("CTAT") Results—Fall 2020	4
--Overview	
--Summary and Analysis of Results	
III. Conclusions	7
IV. Proposed Action Plan—Suggested Curriculum Changes	8

# I. SWCC Critical Thinking Assessment Plan and Modifications

## **SWCC's Definition of "Critical Thinking":**

Because the term "critical thinking" can be interpreted broadly, SWCC's Critical Thinking Assessment Workgroup ("CTAW") defines this competency using the definition and learning outcomes developed by the college in 2015-2016 for its Quality Enhancement Plan ("QEP"), which are as follows:

Definition: "Critical thinking is the internalized and recursive process of decision-making using acquisition, analysis, synthesis, and application to solve problems creatively. In addition, critical thinking is the ability to use information, ideas and arguments from relevant perspectives to make sense of complex issues and solve problems. Degree graduates will locate, evaluate, interpret, and combine information to reach well-reasoned conclusions or solutions."

## Learning Outcomes:

"A degree graduate at Southwest Virginia Community College shall be able to:

1. Identify appropriate resources and synthesize academic information with their personal experiences.
2. Collect and analyze data.
3. Form and evaluate arguments."

## **Assessment Plan and Pandemic Modifications:**

Initially, SWCC's Critical Thinking Assessment Workgroup ("CTAW") planned to assess a sample of 50 students under the stipulations of its original critical thinking assessment plan during the final two weeks of March 2020. However, precautions related to the COVID-19 pandemic forced the SWCC campus to lockdown shortly before the assessment was scheduled to begin. Virtually all instruction for the students who were to be assessed moved online and remained there through Spring 2021. In fact, the lion's share of SWCC's course offerings still remain online.

The Test of Everyday Reasoning—Numeracy ("TER-N"), a proprietary test developed and distributed by Insight Assessment, had been the instrument chosen for the original assessment. However, the TER-N must be given under proctored supervision. Closing SWCC's campus, particularly its testing center, made administering the TER-N impossible and forced the CTAW to develop an alternate assessment instrument and methodology.

To assure that comparable and useful data could be collected in 2020, in April 2020 the CTAW chair devised a plan to develop an in-house test that could be administered to a similar cohort of students. A pilot version of this test, the SWCC Critical Thinking Assessment Test ("CTAT"), was piloted in Summer 2020. The questions on the CTAT, although different in content and presentation from those on the TER-N, are designed to assess the same eight critical thinking capacities it measures: analysis, inference, evaluation, induction, deduction, interpretation, explanation, and numeracy.

For the pilot, the CTAT was placed in the Canvas LMS modules of three Summer 2020 courses—ENG 111-W1, ENG 111-W2, and ENG 112-W1—and students were asked to participate voluntarily with the incentive of a nominal number of extra credit points being added to their final course average for participating. The results were used (1) to assess the feasibility of the CTAT as a possible alternative assessment instrument to the TER-N, (2) to obtain data about the critical thinking skills of SWCC students that could potentially be used as a baseline for future assessments involving the CTAT, and (3) to obtain revealing, useful insights into the critical thinking skills of representative SWCC students.

After conducting and analyzing the Summer 2020 pilot, the CTAW chair concluded that it yielded valid and reliable data that could be used to better inform future decisions about how to improve critical thinking instruction at SWCC. (For details, refer to the CTAW “Report on Critical Thinking Assessment 2019-2020”, issued 8/14/20.)

However, the chair also determined that collecting an additional semester of CTAT data on ENG 111 and 112 students would be relatively feasible and could provide an even more representative sample and more informative data. Thus, in Fall 2020, 79 additional students were given the same version of the CTAT used in Summer, using the same methodology. In ENG 111, 61 students from five course sections participated. In ENG 112, 18 students participated, all from the one available section. Incidentally, five of the students participating in the ENG 112 test had also tested in the Summer pilot. Since the ENG 112 course involves a greater emphasis on critical thinking skills and content, the data obtained from each iteration of the test revealed meaningful insights into the impact of critical thinking instruction on SWCC students who had taken both courses.

## **II. SWCC Critical Thinking Assessment Test (“CTAT”) Assessment Results—Fall 2020**

### **Overview:**

In the CTAT’s Summer 2020 pilot, 41 Associates degree students from two ENG 111 sections and one ENG 112 section were tested, offering a sample size that is comparable to the sample stipulated by SWCC’s original assessment plan, which planned to test 50 Associates degree students. After the CTAT was administered, test results were reviewed for any significant validity and reliability issues. It was concluded that the test yields reasonable and useful information of our students’ critical thinking capacities.

An average or “baseline” score was determined by tabulating the average pilot score for all test participants. This average, 62.29%, was used as a preliminary benchmark for Fall 2020 assessment activities, as were other relevant figures culled from the pilot. (See “Summary and Analysis of Results” below.)

Individual questions were scrutinized for their relative level of difficulty. “Easy” questions were defined as those answered correctly by 90% or more participants, while “difficult” questions were defined as those answered correctly by fewer than 30% of participants. Four questions ranked as “difficult” (questions 6, 11, 31 and 33) and five as “easy” (questions 2, 4, 5, 8 and 16). However, no CTAT questions were missed by all participants, and none was answered correctly by all of them.

Since results from the pilot suggested that the CTAT questions were reasonably fair, clearly written, and thus could generate meaningful insights into the critical thinking skills of SWCC’s students, the CTAT was once again administered in Fall 2020. This time the test was given to a larger cohort of ENG 111 and 112 students (79 total), as it was readily available and could produce a larger student sample and even more useful data.

Because of its limited nature, results from the Summer 2020 pilot did not differentiate between ENG 111 and 112 students. However, in Fall 2020 separate results were collected for ENG 111 and 112 students. Since ENG 112 emphasizes critical thinking content more than ENG 111 does, the differences in results between the two courses offer additional insight into the effectiveness of ENG 112 instruction in improving critical thinking proficiency.

**Summary and Analysis of Results:**

The following tables summarize the quantitative results obtained from the Fall 2020 assessment and provide analysis of some interesting trends. It should be noted that student participation in this assessment was voluntary but incentivized with a nominal amount of extra credit. In the five ENG 111 sections, 61 out of 98 students participated (62.2%), while in the one ENG 112 section 18 out of 28 students participated (78.2%).

<b>Proficiency Rating</b>	<b>CTAT Score Range</b>	<b>% of Students Earning Score (ENG 111)</b>	<b>% of Students Earning Score (ENG 112)</b>	<b>Increase/Decrease between ENG 111 and 112 (%)</b>
Highly proficient	81% or higher	3.27 (2 out of 61)	11.1 (2 out of 18)	+ 7.83
Proficient	62.29-80.99%	44.26 (27 out of 61)	50 (9 out of 18)	+ 5.74
Competent	50-62.28%	31.14 (19 out of 61)	27.7 (5 out of 18)	- 3.44
Weak/Not Manifested	49.99% or below	21.31 (13 out of 61)	11.1 (2 out of 18)	- 10.21

In this assessment, 78.67% of ENG 111 CTAT participants achieved a proficiency rating of “Competent” or higher. For students completing ENG 112, the figure is 88.8%--an increase of

10.13%. Likewise, 61.1% of ENG 112 students scored either in the “Proficient” or “Highly Proficient” range on the CTAT, while only 47.5% of ENG 111 students in either of these top two ranges. For this figure, the increase from ENG 111 to 112 is 13.6%.

**These figures suggest that, overall, student achievement in the critical thinking competencies measured by the CTAT increase markedly between ENG 111 and 112.**

Proficiency Rating	% of Students Achieving This Rating or Higher	Original Plan Goal	Goal Met?	% Increase Needed to Reach Goal
Highly Proficient	ENG 111: 3.27 ENG 112: 11.1	25% or above	ENG 111: No ENG 112: No	ENG 111: 21.73 ENG 112: 13.9
Proficient	ENG 111: 47.53 ENG 112: 55.5	50% or above	ENG 111: No ENG 112: Yes	ENG 111: 2.47 ENG 112: N/A
Competent	ENG 111: 81.94 ENG 112: 83.2	95% or above	ENG 111: No ENG 112: No	ENG 111: 13.06 ENG 112: 11.8
Weak/Not Manifested	ENG 111: 21.31 ENG 112: 11.1	5% or lower	ENG 111: No ENG 112: No	ENG 111: 16.31 ENG 112: 6.1

As indicated by the table above, only one of the originally stipulated rating targets—the 50%-or-above standard for a rating of “Proficient” or above—was reached. However, one should keep in mind that these standards are somewhat arbitrary by nature and were only intended as relative guideposts. As mentioned in the pilot report, this may suggest that further adjustment of these targets may be needed based on the results of future CTAT testing, as some of them may be too ambitious (see “Conclusions”, #2).

Proficiency Rating	% Change: ENG 111 to 112	Improvement?
Highly Proficient	+ 2.23	Yes
Proficient	+ 5.74	Yes
Competent	- 3.44	No
Weak/Not Manifested	- 15.81	Yes
Overall CTAT Test Score	+ 8.45	Yes

Four of the five indicators above show improvement in CTAT performance in ENG 112 students over ENG 111 students, which presumably indicates that students’ critical thinking capacities increase demonstrably after completion of ENG 112. The 3.44% dip in scores for the “Competent” rating is probably explained not by decreased student achievement but by the corresponding increases in the higher “Proficient” and “Highly Proficient” ratings achieved by the ENG 112 cohort.

Finally, of the 79 students assessed in Fall 2020, five were identified as having taken the CTAT in both Summer and Fall. Although this is a relatively small cohort, their difference in average CTAT score from ENG 111 to 112 was measured and turned out to be an average increase of 14.55%, another encouraging figure.

### III. Conclusions

Although data of the type collected for this report may be interpreted in myriad ways, the opinion of SWCC's critical assessment team is that the results presented above merit the following conclusions:

1. In this assessment, ENG 112 students performed significantly better on the CTAT than did those in its prerequisite course, ENG 111. Because the content of the ENG 112 sections tested for this assessment contained a greater emphasis on the specific critical thinking competencies assessed by the CTAT, it seems reasonable to conclude that the critical thinking content incorporated into ENG 112 sections improved markedly the assessed students' critical thinking skills.
2. Despite such positive results, the originally stipulated target set for the percentages of ENG 112 students who should obtain proficiency ratings of "Competent" or above (95% of all students) seems unrealistically high, making the results of this assessment appear less of an achievement than they actually are. If the CTAT is used for future assessments, these targets should be re-examined and perhaps revised downward.
3. Since the critical thinking content incorporated into ENG 112 appears to have a markedly positive impact on critical thinking skills (see Conclusion #1), other courses in SWCC's general education curriculum potentially could benefit from the introduction of—or greater emphasis on—similar content. SWCC's Quality Enhancement Plan ("QEP"), which has been in place since 2016, stipulates SDV 100 as a required entry-level course for the majority of students enrolled in transfer programs. Developing critical thinking skills is a core learning outcome of this course. Since as many as 10-20% of SWCC's transfer students take SDV 100 in any given semester, it follows that this course may be the first in which such enhancements could be incorporated.
4. As stated before, CTAT results clearly indicate that improvements to students' critical thinking skills are clearly taking place in the assessed ENG 112 cohort—and at a substantial level. Also, CTAT results suggest that critical thinking instruction in this course impacts the majority of SWCC's transfer students, since ENG 112 is a core general education course taken by the vast majority of them. However, it should also be taken into consideration that mandating the incorporation of additional critical thinking content to all sections of ENG 112 may negatively impact an instructor's capacity to address the course's other learning outcomes.

Thus, ENG 112's content probably should not be modified at this time, at least to any substantial degree.

5. It is possible, however, that a variety of other general education courses could make room in their curricula for additional critical thinking content. Nonetheless, identifying how and where to best do this is a complex issue, one that merits further study.

## **IV. Proposed Action Plan—Suggested Curriculum Changes**

As discussed above in Conclusion #3, SDV 100 is probably the best course for which to consider making initial curriculum modifications to improve students' CTAT scores and thus their critical thinking capacities.

In January 2021, committee chair Greg Horn solicited feedback from Academic Vice President Dr. Robert Brandon about the findings summarized in this report. Dr. Brandon suggested that beginning with the 2021-2022 academic year, this assessment should only be conducted only in Fall semester of each year, since collecting and reporting additional data for each Spring and Summer semester would probably be unnecessarily excessive. Also, Dr. Brandon suggested that the committee consider identifying other courses in which the CTAT could be administered to obtain further insight into the critical thinking capacities of SWCC students.

It was also suggested that the chair meet with the QEP's Director and Critical Thinking Implementation Specialist, Julia Dotson, to discuss ways to modify SDV 100's curriculum—which is already routinely revised—to potentially improve CTAT scores. Plans could then also be made to assess the efficacy of any changes made to SDV 100.

Committee chair Greg Horn subsequently consulted with Julia, who indicated that no plans were in the works to change SDV 100's curriculum at the time. However, she did mention that changes would perhaps be considered in the 2021-22 academic year. Horn suggested that data from this assessment could be taken into account when considering these changes.

Follow-up is ongoing. In April 2021 instructor Aranda Vance's ENG 242 class was assessed using the CTAT in order to obtain data on a cohort of students with higher numbers of earned credit hours than those earned by ENG 112 students. Results for this cohort will be incorporated into next year's report. Also, a set of practice CTAT questions has been developed for use with ENG 112 students taking future iterations of the test. Since it is SWCC's intention to foster improvement in critical thinking skills in students who have had at least two semesters of college-level instruction—but not to do so in a way that impedes effectively addressing other learning outcomes—it seems best to provide this additional instructional content for ENG 112 students. These practice questions will be introduced in the Fall 2021 semester.