



The California Critical Thinking Skills Test (CCTST) is a graduation requirement for all ETSU undergraduate students. Students are eligible to complete the CCTST will result in having your diploma held until this condition is met. What is the CCTST? The California Critical Thinking Skills Test (CCTST) is an approved standardized test administered by ETSU to fulfill Quality Assurance Funding (OAF) Standard 1: General Education Assessment, The General Education Assessment is designed to provide incentives to institutions for improvement in the guality of their undergraduate general education program as measured by the performance of graduates on an approved standardized test of general education. Each year ETSU's average is compared to the national average for that year. All undergraduate students graduating in the fall, spring, or summer semesters are required to take the CCTST, but some exemptions may apply. The CCTST is a 45 minute, 34-item, multiple-choice test that evaluates students' ability to analyze, infer, explain, evaluate, and interpret information. Contact: Megan MillerTelephone: (423) 439-6712E-Mail: millerme2@etsu.edu The CCTST (Facione, 1990; P. A. Facione & N. C. Facione, 1994) was developed, validated, and used for assessing students' CT skills. It is a standardised, 34-item multiple choice test, non discipline-specific that targets core critical thinking skills. Each item on the CCTST is assigned to one of three subscales: Analysis, Evaluation, and Inference. Note: The overview provided for this instrument includes content that may have been sourced from the instrument publisher's or author's website (or other site providing information about the instrument). This information is presented for educational and informational purposes only. If you have any questions about the content or its permitted uses, please contact annenberg@brown.edu. American Institutes for Research® partnered with the Annenberg@brown.edu. student well-being. California Academic Press Insight Assessment 650-697-5628 1735 N 1st Street, Suite 306 San Jose, CA 95112-4511 USA Facione, Peter A. (1990) The California Critical Thinking Skills Test--College Level. Technical Report #1. Experimental Validation and Content Validity (ED327549). Facione, P. A. (1990). The California Critical Thinking Skills Test--College Level. Technical Report # 2. Factors Predictive of CT Skills. CCTST was developed based on the results of the Delphi Project which was mentioned in Chapter one. The test is now a commercially produced and standardised test from Insight Assessment ( . It is widely used to evaluate learners' critical thinking skills at universities and colleges in many countries (Facione, Facione, & Winterhalter, 2011; Wheeler & Collins, 2003; Yang, 2008; Zhou, Wang, & Yao, 2007). CCTST was available in more than 20 languages, but not Vietnamese. Due to the work of this researcher, a Vietnamese version was developed and became an authorised translation (Facione Research Phases Research questions Data collecting and analysing methods 1. The Development of the CSI Model Online evaluation 2. The Implementation of the pedagogic model increase interaction within the learning environment? Observation scheme (to evaluate the degree of interaction): t-test, Cohen's d Questionnaire: descriptive statistics, graph, t-test Interview 2. Does the application of the pedagogic model improve students' critical thinking skills? CCTST: t-test, Cohen's d Questionnaire: descriptive statistics and graph et al., 2011; Insight Assessment, 2011). The process of translation of the test contained six stages: 1. Translation of the test was reviewed by three Vietnamese lecturers. 3. Independent translation of the Vietnamese version back into English. 4. Revisions to the Vietnamese version of the test requested by Insight Assessment. 5. Revision of the Vietnamese version. 6. Approval by Insight Assessment of the final version. The test containing 34 multiple choice questions assesses critical thinking skills that are measured through the scores of five individual scales: analysis & interpretation, inference, evaluation & explanation, inductive reasoning and deductive reasoning. The reliability and validity of the test were ensured and outlined in the test manual. Reliability According to Streiner (2003), in a test the score of a student should reflect a true score; however, the total score normally includes the true score and errors related to measurement. Therefore: = + In a simple way, reliability can be considered as the ratio of the variance of the true scores and total scores: 86 = where is variance of total scores, and is the variance of total scores, and is the variance of total scores and total scores. This equation is used in cases where a group of people with different characteristics is measured. If the group has the same characteristics which need to be measured, their true score would be the same. As a result,  $\sigma = 0$ , and the equation becomes meaningless. Internal consistency reliability is also an important measure, and reflects how well test items measure the same construct producing similar results (Cohen et al., 2011; Muijs, 2004). It was originally calculated by the split-half method (Cronbach & Shavelson, 2004; Streiner, 2003). Based on the idea of computing the mean of all probable split half reliabilities, Kuder and Richardson (1937) developed a more accurate formula 20 (KR20) 20 = ! - 1 \$1 -!  $\sum \&'(')$  where k is the number of items, &'the number of correct answers per total number of answers, ('the number of incorrect answers per total number of answers. Cronbach (1951) developed KR20 into the formula: \* = ! - 1 \$1 -!  $\Sigma$  ') where is standard deviation, the variance of total scores, ' the Alpha(\*) is the general formula of the Kuder-Richardson Formula 20 which is only applied for dichotomous (binary) variables (Cliff, 1984; Cronbach & Shavelson, 2004; Streiner, 2003). Both internal consistency reliabilities, Cronbach's Alpha and KR20 range from 0 to 1 (Cortina, 1993; Cronbach & Shavelson, 2004). These coefficient are equal to or large than 0.7 means that the tests are considered reliable (Cohen et al., 2011; Facione et al., 2011; Muijs, 2004). In the CCTST, KR20 was calculated. It varied from 0.78 to 0.82 (Facione et al., 2011) (reliable). Validity and criterion validity. Content validity reflects if a test covers the abilities or domain of content which is being measured (McGoey, Cowan, Rumrill, & LaVogue, 2010). Construct through observable variables (Jha, 2008). Criterion validity presents the precision of a test by comparing it with external criterion (Cohen et al., 2011). The three kinds of validity of the CCTST were ensured by the research group at Insight Assessment (Facione et al., 2011). Content validity was addressed by designing the test items based on definitions and descriptions of critical thinking skills and sub-skills from research of the America Philosophical Association (Facione, 1990a). Construct validity was reassured by considering many aspects such as excluding social class and sex-role contexts, reviewing by independent researchers, and proving the increase of learners' CCTST scores after attending 88 critical thinking courses and training programmes. There are two types of criterion validity. predictive validity and concurrent validity (Muijs, 2004). Predictive validity is defined if the test can predict theoretical expected outcomes; the CCTST scores significantly positively correlate with predicted graduate performance (Giddens & Gloeckner, 2005; McCall, MacLaughlin, Fike, & Ruiz, 2007; Williams et al., 2003). Concurrent validity refers to what extent the test agrees with other tests (Cohen et al., 2011); CCTST scores strongly correlate with the scores of other critical thinking and higher order reasoning tests (e.g. GRE total score: r = 0.719, p