INSIGHT ASSESSMENT

Advancing THINKING Worldwide

The focus on critical thinking is global.
Here is a selection of independent research studies focused on
Training Critical Thinking and Leadership

The Assessment	*The Citation*	*The Findings*
HSRT	***Enhanced numeracy skills following team-based learning in United States pharmacy students: a longitudinal cohort study.*** Carpenter RE, Coyne L, Silberman D, Takemoto JK. 2022. J. Educ Eval Health Prof. 19. 29. *USA*	***Pharmacy:*** This study explored the impact of Term-Based Learning (TBL) instruction on numeracy development in 2 cohorts of pharmacy students. The students' (n=163) Numeracy skills measured by HSRT-N improved significantly after 2 years of TBL instruction. Initial data suggest that TBL instruction may be an adequate proxy for advancing numeracy in a cohort of pharmacy students. TBL may encourage a social practice of mathematics to improve pharmacy students' ability to numerate critically.
CCTST	***Instructional effects on critical thinking: Performance on ill-defined issues.*** Angeli C & Valanides N. 2009. Learning and Instruction. Volume 19, Issue 4, 322-334. *Cyprus*	***Education:*** The teaching method was significant. Infusion and Immersion groups outperformed the control group. students assigned to the different teaching groups exhibited diverse understandings of critical thinking.
HSRT	***Applying digital storytelling in the medical oncology curriculum: Effects on students' achievement and critical thinking.*** Zarei A, et al. Ann Med Surg (Lond) 2021. 70, 102528. *IRAN*	***Medicine:*** This study examined Digital storytelling (DST), which combines traditional storytelling with digital tools, to determine whether it can provide a narrative pedagogy that promotes critical thinking (CT), in a matched pairs pretest-postest design. HSRT scores, not different at pretest, rose in the DST experimental group, but did not improve in the control group. We recommend the use of DST to promote CT in clinical education placements.
MDCTI *Skills & Mindset*	***An Assessment of the Command and General Staff Officer Core Course Effectiveness in Developing Student Critical Thinking.*** Civils, TH (Dissertation). *USA*	***Officer Training:*** Pretest posttest evaluation study of the U.S. Army Command and General Staff Officer Common Core Course to change student critical thinking skills and habits of the mind attributes in eight student staff groups (n=120). Statistically significant changes in analysis, induction, deduction, and overall critical thinking skills, and in the Communicative Confidence, Professional Confidence, Expression, and Directness habits of the mind attributes.
HSRT	***Does Use of an Electronic Health Record with Dental Diagnostic System Terminology Promote Dental Students' Critical Thinking?*** Reed S, Adibi SS, Coover M, Gellin RG, et al. J Dent Educ 2015m 79 (6), 686-696. Collaborative investigation by the Consortium for Oral Health Research and Informatics (COHRI). *USA*	***Dentistry:*** COHRI is leading the way in use of the Dental Diagnostic System (DDS) terminology in the axiUm electronic health record (EHR). This study was a natural experiment with cross-sectional data collection using the HSRT for 15 classes (2013–17) of students at three dental schools. Characteristics of students who had been exposed to the DDS terms were compared with students who had not been exposed. Exposure was significantly related to OVERALL HSRT score (p=0.01), with not-exposed students having lower scores. This study demonstrates a positive impact of using the DDS terminology in an EHR on the critical thinking skills of predoctoral dental students.
BCTST	***The Use of Argument Mapping to Enhance Critical Thinking Skills in Business Education.*** Kunch DW, Schnarr K, van Tyle R. 2014 J Educ Business. *USA*	***Business:*** In a dedicated, in-person critical thinking class, argument mapping techniques were used in conjunction with business and nonbusiness case studies to build the critical thinking skills of a group of master students in business administration. Results demonstrated that the critical thinking ability of the student sample improved significantly as measured by the BCTST. The use of argument mapping techniques may be a useful tool to assist practitioners in business settings with complex decision making.
CCTST	***Improvement of nursing students' critical thinking skills through problem-based learning in the People's Republic of China.*** Yuan H, et al. Nurs. Hlth. Sci. 2008 Mar;10(1): 70-6. *Taiwan, China*	***Nursing:*** Problem-based learning improved critical thinking skills. Problem-based learning students had a significantly greater improvement on OVERALL score, as well as the Analysis and Induction scale scores compared with the lecture students at posttest.

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HSRT	***Investigating the clinical decision-making of nursing students using high-fidelity simulation, observation and think aloud: A mixed methods research study.*** Abdulmohdi N & Mcvicar A. J Adv Nurs 2023 79(2) 811-824. *United Kingdom*	***Nursing:*** This study investigated the efficacy of a 'think aloud' training technique to improve nursing students' clinical decision-making. The students were audio-video recorded and observations were collected by the researcher. The HSRT measured reasoning skills before and after a high-fidelity simulation of a deteriorated patient scenario. HSRT Deduction and Analysis scores increased significantly after the training.
CCTST	***Learning to Improve: Using Writing to Increase Critical Thinking Performance in General Education Biology.*** Quitadamo IJ, Kurtz M. CBE Life Sci Educ. 2007 Summer; 6(2): 140–154. *USA*	***Biological Sciences:*** Students experiencing a laboratory writing treatment significantly improved critical thinking skills whereas the traditional quiz-based laboratory students did not. Other co-variables such as gender, ethnicity and age were not significant.
CCTDI	***Critical thinking of nurse managers related to staff RNs' perceptions of the practice environment.*** Zori S, et al. 2010. Journal of Nursing Scholarship. 42, 305-313. *USA*	***Nursing Professionals:*** Results of the study support the positive relationship between strength in critical thinking dispositions of nurse managers and their respective staff RNs' perceptions of the practice environment. Nurse managers with stronger CT dispositions may be better able to create positive practice environments that are conducive to job satisfaction and thus the retention of staff RNs.
HSRT	***Incorporation of an Explicit Critical-Thinking Curriculum to Improve Pharmacy Students' Critical-Thinking Skills.*** Cone C, Godwin D, Salizar K, et al. Am J Pharm Educ. 2016, 80(3) 41. *USA*	***Pharmacy:*** Significant improvement in HSRT scores occurred following student immersion in an explicit critical-thinking curriculum. The HSRT was useful in detecting these changes, showing that critical-thinking skills can be learned and then assessed over a relatively short period using a standardized, validated assessment tool like the HSRT.
CCTDI	***Critical Thinking Disposition and transformational leadership behaviors: A correlational study. Godzyk KE. 2008. Dissertation. Book. Management in Organizational Leadership. USA***	***Business Professionals:*** The current explanatory, quantitative study examined the correlation between the critical thinking disposition and leadership behaviors of leaders in service industries in the United States. The study results indicate a moderately positive correlation between the critical thinking disposition and transformational behaviors of the study participants. The finding supports further research into whether critical thinking disposition could be used to predict leadership emergence. The study result has potential implications for trait theory of leadership and leadership development and may provide the foundation for a new model of leadership assessment: leadership disposition.
CCTDI	***Building the Critical Thinking Mindset with Training in Argument Mapping.*** Eigenauer JD. Inquiry: Critical Thinking Across the Disciplines, Summer 2016. Vol.31. *USA*	***Community College Liberal Arts:*** Instruction in argumentation was studied for its ability to improve critical thinking. In a pretest post design, a sample of 78 community college Students demonstrated significantly stronger critical thinking mindset at posttest. Significant growth occurred for Truth-seeking, Open-Mindedness, Systematicity, and Maturity of Judgment. 90% of students moved from ambivalent scores to strong scores in Truth-seeking, and 61% from ambivalent to strong in Maturity of Judgment.
HSRT	***Do knowledge, knowledge sources and reasoning skills affect the accuracy of nursing diagnoses? a randomised study.*** Paans w, et al. 2012. Determinants of the accuracy of nursing diagnoses: Influence of ready knowledge, knowledge sources, disposition toward critical thinking and reasoning skills. 2010. Paans W, et al. J Prof Nurs 26(4), 232-41. *The Netherlands*	***Nursing:*** This paper reports a study about the effect of knowledge sources, such as handbooks, an assessment format and a predefined record structure for diagnostic documentation, as well as the influence of knowledge, disposition toward critical thinking and reasoning skills, on the accuracy of nursing diagnoses. The use of a predefined record structure resulted in a significantly higher accuracy of nursing diagnoses. A regression analysis reveals that almost half of the variance in the accuracy of nurses' diagnoses was explained by the use of a predefined record structure, a nurse's age and the HSRT reasoning skills scores of `Deduction' and `Analysis'. CCTDI Systematicity and Maturity of Judgment scores, and HSRT Inference and Induction scores were also significant predictors of the accuracy of nursing diagnoses.

CCTST	***Online discussion forums addressing problems in engineering mathematics improved critical thinking skills.*** *Procedia - Social and Behavioral Sciences.* Jacobs. Volume 31, 2012, Pages 805-809. *Malaysia*	***Engineering:*** Gains in critical thinking skills were observed at posttest. Gains were attributed to the pedagogical techniques embedded in the online discussion fora conducted to address problems in engineering mathematics.
CCTST, HSRT, BCTST, TER, MDCTI, CCTDI	***Strategies for Teaching Students to Think Critically: A Meta-Analysis.*** Abrami PC, Bernard RM & Persson T. 2015 Review of Educational Research. 85(2). *Canada*	***Multi-disciplinary:*** Critical thinking (CT) is purposeful, self-regulatory judgment that results in interpretation, analysis, evaluation, and inference, as well as explanations of the considerations on which that judgment is based. This article summarizes the available empirical evidence on the impact of instruction on the development and enhancement of critical thinking skills and dispositions and student achievement. The review includes 341 effects sizes drawn from quasi- or true-experimental studies that used standardized measures of CT as outcome variables. The weighted random effects mean effect size (g+) was 0.30 ($p < .001$). The collection was heterogeneous ($p < .001$). Results demonstrate that there are effective strategies for teaching CT skills, both generic and content specific, and CT dispositions, at all educational levels and across all disciplinary areas. Notably, the opportunity for dialogue, the exposure of students to authentic or situated problems and examples, and mentoring had positive effects on CT skills.
HSRT	***Critical Thinking in Dental Students and Experienced Practitioners Assessed by the Health Sciences Reasoning Test.*** Hanlon JP. and colleagues. Dental Educ. 2018, 82(9) 916-920. *USA*	***Dental Education & Dentists:*** The critical thinking skills of First-year dental students at the University of Texas Health Science Center at San Antonio (novices) were compared to a recruited sample of dental faculty and practicing dentists (experts). Mean scores for HSRT OVERALL in experienced general dentists (25.31 on the 33-point version) were significantly stronger than those of first-year dental students (22.64), suggesting the instrument was able to measure differences between novice and expert. The expert cohort scored higher in all scales (Induction, Deduction, Analysis, Inference, and Evaluation).
CCTST	***The Relationship Between College Experience at an Historically Black College and Students' Critical Thinking Skills.*** Little, I.P. 2017. Dissertation. *USA*	***Undergraduate Campus Life:*** Five dimensions of the undergraduate experience were measured: on/off campus residency, membership in a sorority or fraternity, participation in intercollegiate sports, participation in extracurricular activities, and year in school. Only year in school and strength in critical thinking were significantly related $F(3,159) = 4.04$, $p = .008$. Critical thinking skills were being strengthened in this cross-sectional sample.
CCTST and CCTDI	***Case studies combined with or without concept maps improve critical thinking in hospital-based nurses: a randomized-controlled trial.*** Huang YC. Et al 2012, Int. J Nurs Studies, 49 (6), 747-54. *Taiwan, China*	***Hospital Nurses:*** This study of a training program designed for Hospital Nurses examined the effectiveness of using concept-mapping (CM) as a technique for improving critical thinking skills and mindset. Critical thinking skills increased for both the CM group as well as the control group. Critical thinking mindset, as measured by the CCTDI, increased significantly more in the CM group.