Creative Thinking as a Foundation for Design Thinking

Implications for Creative Problem-Solving Competence and Psychological Capital in Management Education

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ABSTRACT

This study examines how creative problem-solving (CPS) competence and Psychological Capital (PsyCap) develop among management students taking Creative Thinking (CT) and Design Thinking (DT) at successive stages of the curriculum, and whether baseline PsyCap predicts later CPS performance. Using a quasi-experimental pretest–posttest design with two non-equivalent cohorts (n = 291), both improved in CPS competence and PsyCap. DT students gained more in Problem Understanding and Solution Coherence, whereas CT students gained more in Adaptability, self-efficacy, resilience and overall PsyCap. Overall CPS did not differ after baseline adjustment, and baseline PsyCap was a significant but modest predictor of CPS. The two courses appear to support different but potentially complementary aspects of student development.

Keywords: *Design Thinking; Creative Thinking; Psychological Capital; Creative Problem-Solving Competence; Management Education*

291	2	14	6
students	curricular cohorts	weeks per course	CPS dimensions

INTRODUCTION

Business schools are expected to prepare graduates who can frame ambiguous problems, evaluate alternatives and revise decisions as new information emerges. Experiential and design-oriented pedagogies respond to this need, yet many evaluations rely on students' self-reported creativity rather than observable performance.

Less is known about how sequential courses shape distinct competencies. In the studied curriculum, CT is a second-semester foundation in ideation, while DT extends it through user inquiry, prototyping and testing. This study therefore combines a performance-based CPS task with PsyCap, a developable set of psychological resources (self-efficacy, hope, resilience and optimism), to examine three hypotheses.

HYPOTHESES AND OUTCOMES

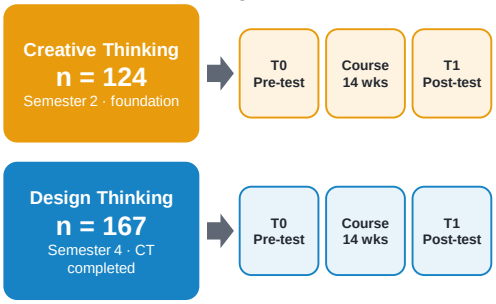
H1 Changes in CPS competence differ between the CT and DT cohorts — **Partially supported**

H2 DT students show greater improvement in PsyCap than CT students — **Not supported**

H3 Baseline PsyCap positively predicts post-intervention CPS — **Supported (modest)**

RESEARCH METHOD

Quasi-experimental non-equivalent-cohort pretest–posttest design at a private university in Indonesia. Both courses: 3 credits, same instructor, same assessment weighting. Analysis (jamovi): paired and independent t-tests, ANCOVA with baseline as covariate, hierarchical regression.



Picture 1. Research design: two non-equivalent curricular cohorts

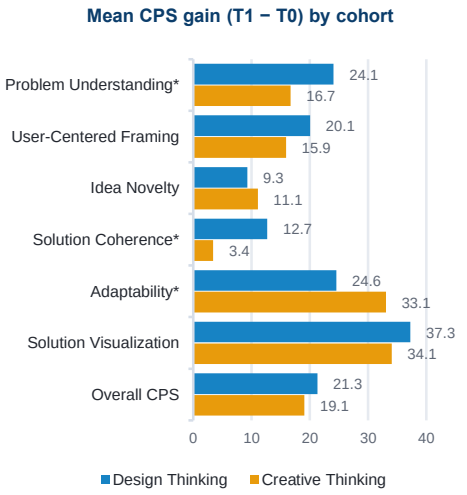
CPS competence	Psychological Capital
Adapted Design Thinking Creativity Test	Adapted PCQ, 12 items, 6-point scale
6-dimension rubric, 3 expert assessors (consensus)	α = .917 (T0), .937 (T1); CFA at T0 and T1

	Creative Thinking	Design Thinking
Output	2-D concepts	Medium–high fidelity prototypes
Market testing	None	Prototype testing with users
Iteration	Not required	Feedback-based refinement

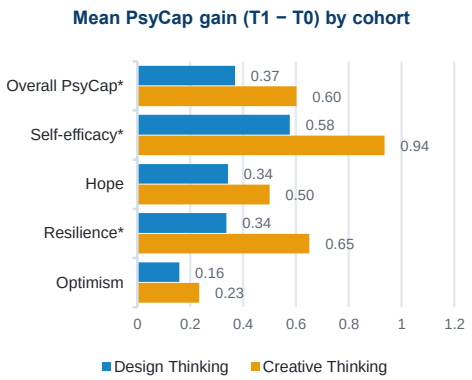
Table 1. Principal instructional distinction between the courses

RESULT AND DISCUSSION

Across the full sample, CPS (t(290) = 20.5) and PsyCap (t(290) = 11.6) rose significantly (p < .001). Between-cohort gains differed by dimension:



Picture 2. CPS gain scores; * p < .05 between cohorts (DT − CT). ANCOVA on overall CPS: F = 0.045, p = .832.



Picture 3. PsyCap gains; * p < .05 between cohorts. Significant group × baseline interaction in ANCOVA: interpret with caution.

β = .183 Baseline PsyCap → post CPS (p = .002)

R^2 = .045 Model 2; ΔR^2 = .033 modest explanatory power

DT's weekly cycle of field inquiry, user validation, prototyping and revision is consistent with its larger gains in Problem Understanding and Solution Coherence. CT's greater conceptual freedom may explain its stronger gains in Adaptability, self-efficacy and resilience, whereas repeated user feedback in DT may encourage more cautious self-evaluation. Because cohorts differed in curricular stage and prior coursework, these are adjusted between-cohort patterns, not causal course effects.

CONCLUSION

CT cohort: larger gains — Adaptability · Self-efficacy · Resilience · Overall PsyCap

+

DT cohort: larger gains — Problem Understanding · Solution Coherence

Picture 4. Significant between-cohort differences; overall CPS did not differ (ANCOVA p = .832)

Both courses were associated with positive gains, but in different competencies. After baseline adjustment, overall CPS did not differ (H1 not supported overall; partially supported at the dimension level). The DT cohort gained more in Problem Understanding and Solution Coherence, whereas the CT cohort gained more in Adaptability and in overall PsyCap, self-efficacy and resilience, contrary to H2. Baseline PsyCap was a significant but modest predictor of CPS (H3).

These are complementary profiles across successive curricular stages, not a trajectory within the same students or causal course effects. Longitudinal tracking of the same students is recommended.

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