

Transformational Learning Theory and Alternatives to Obstacles in the Development of Intelligence Professionals

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Editor's Note: Studies is committed to professional and substantive debate on issues relevant to the intelligence practitioner. In this commentary, Steven Shenouda, et al., offer a critique of Dr. Julie Mendosa's article, "Transformational Learning for Intelligence Professionals" (Studies in Intelligence 66, no. 3 (September 2022)), which explored how students at the National Intelligence University make meaning and suggested that intelligence organizations should create developmental cultures by providing opportunities for discourse, collaboration, and sharing. We include Dr. Mendosa's response and a rebuttal by Shenouda, et al. Developing new knowledge is integral to Studies' mission, and we invite readers' comments on any article or media review.



In her September 2022 article, Dr. Julie Mendosa seeks to understand how students learn at the National Intelligence University (NIU) and puts forward that they should be able to think autonomously and adaptively with concrete and abstract thinking abilities. Mendosa reports, albeit from a severely underpowered study in which only a few subjects completed the retest questionnaire, that there appears to be more concrete, rules-based thinking than independent abstract thinking on campus.

But there are many problems with Dr. Mendosa's study. For instance, there are methodological problems with test/retest protocols. Without proper controls, internal validity is compromised, making it impossible to determine whether observed changes are due to the experimental condition or to one of the other possible sources of change, including maturation effects, history effects, regression to the mean, and experimenter bias. Furthermore, conceptual and theoretical issues limit the application of Mendosa's findings. For these reasons, and because she did not include an adequate control, causal inferences are tenuous at best, and therefore caution should be taken when considering the application of Transformational Learning Theory in the IC or NIU.

Compromised Internal Validity

Student responses and the changes in them perceived by Mendosa could easily have occurred without NIU experience. Mendosa's study falls short of demonstrating that students' answers to the protocol questions and the purported changes were in fact due to the NIU experience. Unfortunately, Mendosa collected responses from one group of students at two points in time. In the methodological literature, this approach to data collection is known as a one-group pretest-posttest design, which Campbell and Stanley (1963) in their now classic analysis of research designs used for assessment of higher education outcomes, referred to as a "bad example" (7).

The problem is that factors other than NIU experience are capable of producing the same responses observed by Mendosa, which also means that the same outcomes might be observed in students enrolled somewhere other than NIU. Research findings cannot be trusted if the design used to collect data lacks internal validity, and therefore, curricula ought not be built on them. Internal validity depends on the extent to which treatments, conditions, or programs to which participants are exposed are in fact responsible for the observed outcomes. As Campbell and Stanley remind us, internal validity is "the basic minimum without which any experiment is uninterpretable." (7) One-group pretest-posttest designs fall short on the

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criterion of internal validity for at least four important reasons, meaning that Mendosa's study cannot be taken as evidence regarding anything about the NIU experience.

First, the administration of a pretest produces changes in behavior and cognition in study participants even when treatments or programs have no independent effect. Campbell and Stanley point out that "on achievement and intelligence tests, students taking the test for a second time, or taking an alternative form of the test, etc., usually do better than students taking the test for the first time... these effects... occur without any instruction." (9) Indeed, reviews of research conducted over 50 years ago underscore the numerous ways in which pretesting affects outcomes. (Lana, 1966) The Solomon four-group design was proposed so that pretest effects can be detected. (Campbell & Stanley, 1963) It is impossible to separate pretest effects from NIU experience effects in Dr. Mendosa's study.

Second, the one-group pretest-posttest design is particularly susceptible to history effects, meaning that some event occurring between the pretest and the posttest other than NIU experience was actually responsible for the observed outcomes. Imagine, for example, that graduate students enrolled in an advanced statistics course are confused and anxious because the instructor is an ineffective lecturer. In response, the students locate and master a set of online advanced statistics learning modules. The students then make As on the exam. Clearly in this example, student performance on the exam was not due to the instructor; the students' extracurricular online adventure constitutes a history effect. Control groups are used in research precisely to detect history effects. Unfortunately, Mendosa failed to include appropriate control groups.

Third, biological and psychological processes such as being more or less hungry, bored, tired, motivated, anxious and stressed, etc., typically vary across time and can affect participant responses to protocol materials. Campbell and Stanley refer to these factors as maturation effects. Thus, for example, if NIU students were more anxious and stressed about the novelty of attending NIU during Time 1 but habituated to the environment and the culture later in the semester, more in depth and sophisticated responses could be expected during Time 2 because of the reduction in stress and anxiety that occurs with familiarity of the environment.

Last, changes in the coding and categorization of data produced by human observers can result in differences

in pretest and posttest scores if coders' biological and psychological processes change from pretest to posttest. In this way, changes from pretest to posttest could reflect changes in Mendosa rather than changes in the students, a conclusion contrary to her intent. (For example, Mendosa could have become an easier grader between Time 1 and Time 2.) Among behavioral and social-science researchers, there is general agreement that a panel of independent coders, blind to the hypotheses of the study if not the purpose of the study, should be used to code data so that the reliability of measurement can be calculated.

Before important decisions about program content and pedagogical practice are based on research, it is critical that findings and conclusions from that research are generalizable beyond one coder's subjective evaluation, especially if those findings happen to support the coder's ideological or theoretical preference. However, the reliability and validity of Mendosa's perceptions of the themes embedded in student responses remain a matter for speculation.

In sum, it is possible for any or all of the threats to internal validity to have occurred in Mendosa's study, but it is impossible to detect those threats within a one-group pretest-posttest design. A serious assessment of learning outcomes requires that a valid research design is used to gather data consisting of measures of known psychometric qualities such as reliability and validity. Basing educational and training materials on research findings by seriously flawed research designs and relying on measures of undemonstrated quality is nothing short of a recipe for disappointment, especially if the students who opted out of the study (about half of those initially contacted) respond differently to NIU than to the study volunteers. (For research regarding the differences between volunteer and non-volunteer study participants, see, Rosenthal & Rosnow, 1966.)

Cognition and Learning Models

Mendosa suggests that a Transformational Learning approach can lead to better learning outcomes, given specific intelligence professionals' requirements for skillsets/tradecraft. While Mendosa's efforts and goals are laudable, it is unclear that a Transformational Learning approach is an appropriate approach, because, in addition to the methodological errors in Mendosa's study, it is important to note that domain-general theories of human

cognition and learning, like this one, are, by their nature, much weaker at explaining and, therefore, predicting or shaping any specific human behavior.

Educational decision makers searching for an empirically supported instructional program should first note that the social and behavior sciences are dominated by theories (like TLT) and models that lack conceptual integration, that are often based on patent falsehoods, and championed by faculty at even the most prestigious universities. (Lieberman and Shenouda, 2022) This is due mostly to a paucity of sound interdisciplinary training in education at all levels, resulting in an over-reliance on folk intuitions to guide scientific questions, particularly those that relate to human thinking and decisionmaking.

The matter is compounded by researchers studying the wave tops of human behavior, examining what appears to be evident—as opposed to the biological information-processing architecture beneath the surface. Without an accurate theory and model of how the brain and behavior work, attempting to augment intelligence professionals’ competence will be merely a haphazard endeavor. Without explicitly searching below the wave tops when considering human behavior, to identify and recalibrate the underlying architecture (in this case in relation to mission requirements) researchers take the path of least resistance and rely on intuitions to inform the unseen—the below the surface—leading us to make poor inferences. And when world-renowned academics succumb to these intuitions, correcting them can be difficult given the coalition politics of academic publishing.

Transformational Learning Theory was developed to understand how women entering university as adults best learn and is therefore not a comprehensive theory best able to aid the IC in understanding, predicting, or shaping human activity. According to Jack Mezirow (2003), “Transformative learning is learning that transforms problematic frames of reference—sets of fixed assumptions and expectations (habits of mind, meaning perspectives, mindsets)—to make them more inclusive, discriminating, open, reflective, and emotionally able to change.” (58, Mezirow, 2003) At its core, TLT is a theory that advocates a simplistic, dualistic approach to human nature (see Pinker, 2003). TLT and its kin are useful insofar as they identify that all humans come to a situation with their own experiences and “frames of reference.” Beyond this obvious realization, such theories hold little value as

comprehensive learning theories for understanding the internal procedures that enable and pattern “learning” and that influence human behavior.

What is needed is a model that sidesteps the offering of merely another set of dichotomous labels and provides a framework for understanding why a system (e.g., competence, behavior, emotion) exists, what its information-processing structure is, including the optimal range of inputs the system accepts, and how it develops and individually varies within and across cultures.

Instead of utilizing well-worn labels (e.g., nature versus nurture; innate versus learned; biology versus culture), TLT merely uses alternative dichotomous labels, namely the terminology of instrumental processes (characterized as being closed, genetically determined, and inflexible) versus communicative processes (characterized as being open, culturally unbounded, and flexible). It is important to note that TLT focuses purely on the latter, the discourse and communicative side of “knowing.” Accordingly, TLT emphasizes the non-objectivity of knowledge, suggesting there is no basic framework for understanding human nature. But, just as biologists will attest that there exists such thing as spider nature, lion nature, and chimp nature, there is indeed such thing as human nature, replete with cultural artifacts and formal language.

We suggest there is much to be gained by starting with a conceptually integrated framework for understanding why a system exists, what its information-processing structure is, and how it develops and, in tandem, much to be gained by avoiding alternate frameworks where the whys, whats, and hows are inconsistent.

In sum, a biologically informed view of human nature provides a more enriched model of human cognition and learning than does TLT. The present state of the field suggests the mind contains rich structures of knowledge for understanding the physical, biological, and social domains. Learning, or more appropriately, calibration, is required in each domain. What this means is that learning, rather than being the explanation, is, in a conceptually integrated framework, an umbrella term for the functionally specialized systems that gather and integrate particular sets of information in a manner that is then used to make judgments and decisions in adaptive ways. Such a framework can be of great benefit to the IC.

Conclusions

Given as much, we offer suggestions for how to augment curricula to enhance autonomous and abstract independent thinking among graduating intelligence personnel at NIU. A larger downstream aim might be to

reconcile IC-specific structural requirements (emanating from compartmentalization imperatives) and the subsequent stove-piping culture this creates, with the need for information-sharing and collaboration, given the critical nature of the broader IC mission.



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Dr. Mendosa Responds

The critique by Shenouda, Lieberman, Beatty, Brown, and Atherton of my article applies inappropriate standards to the research in my study and discounts the theoretical framework based on apparent personal preference rather than knowledge of the theory.

The first section of the critique, “Compromised Internal Validity,” applies quantitative research expectations to the qualitative study. Yet the study was conducted from a clearly stated and described perspective within a robust qualitative social science research tradition.^a The study rigorously followed the recommended procedures within this research tradition. Further, Shenouda, et al. find fault with the use of a questionnaire used at Time I and Time II. They erroneously call it a pretest and post-test, and appear to believe it was meant to assess NIU students’ proficiency in meeting curricular learning outcomes. It was not. The purpose of the questionnaire was clearly stated in the article:

A questionnaire collected short answers to questions related to the students and their workplaces that were designed to draw out indications of how students made meaning.

The study was about how the participants made meaning.

Shenouda et al., would have valid procedural and causal concerns if the study had claimed to be measuring or testing causal relationships, had stated the findings were generalizable beyond the participants in the study, or meant to assess student performance of learning outcomes. But it did not.

The second section of the critique, “Cognition and Learning Models,” discounts the theoretical framework of the study, cognitive developmental theory from within the Transformative Learning Theory framework. Shenouda, et al. favor cognitive or biological-based research of human behavior, learning, and, apparently, all of human nature. The critique seems to say human learning must be studied via biological processes and not by intuition (apparently

meaning interpretive research methods and theories built from such methods).

Additionally, the critique discounts the transformational learning theoretical framework without demonstrating any recent familiarity with it. But the critique does contain outright insulting language (without citations) about theories and researchers that come from traditions other than Shenouda, et al.’s stated predictive and determinant scientific preferences. The critique apparently encompasses much of the qualitative interpretive tradition in scholarship, which would be a bit much to rebut here. But a reasonable proposal can be made: humans and our learning are best understood with a variety of research approaches from many scholarly traditions. Certainly we have room to learn about humans, as this study did, by asking them what’s on their minds.^b

In summary, the bottom line might simply be that Shenouda, et al. don’t like qualitative interpretive research or theoretical frameworks that fail to make definitive pronouncements. The study only proposed to offer something to think about, which is a valuable invitation for many *Studies in Intelligence* readers. The study itself might appeal more to conceptual, abstract, and adaptive forms of thinking than to concrete, black-and-white thinking.^c Shenouda, et al. could have saved us all a lot of valuable time by simply agreeing among themselves: “Gee, we really don’t like this kind of research.” Though curiously enough, Shenouda, et al. make a parting recommendation that looks very much like a recommendation in the study: they suggest breaking down stove-piping cultures in the Intelligence Community to allow information-sharing and collaboration. This is very similar to the study’s recommendation that intelligence organizations should create developmental cultures by providing opportunities for intelligence professionals to have discourse, collaborate, and share ideas.



a. J. W. Creswell, *Qualitative Inquiry & Research Design: Choosing among Five Approaches*, 3rd ed. (Sage, 2013); J. A. Maxwell, *Qualitative Research Design: An Interactive Approach* (Sage, 2013); S. Merriam and E. Tisdell, *Qualitative Research: A Guide to Design and Implementation*, 4th ed. (Jossey-Bass, 2016).

b. See inter alia P. Dominicé, *Learning from Our Lives: Using Educational Biographies with Adults* (Jossey-Bass, 2000); E. Drago-Severson and J. Blum-DeStefano, *Tell Me So I Can Hear You: A Developmental Approach to Feedback for Educators* (Harvard Education Press, 2016); C. Moustakas, *Phenomenological Research Methods* (Sage, 1994); C. K. Riessman, *Narrative Methods for the Human Sciences* (Sage, 2008); I. Seidman, *Interviewing as Qualitative Research: A Guide for Researchers in Education & the Social Sciences*, 4th ed. (Teacher’s College Press, 2013).

c. E. Drago-Severson, *Becoming Adult Learners: Principles and Practices for Effective Development* (Teachers College Press, 2004); E. Drago-Severson and J. Blum-DeStefano.

Rebuttal to Dr. Mendosa

Dr. Mendosa's response to Shenouda, et al.'s commentary on her original article, *Transformational Learning for Intelligence Professionals*, attempts to frame our critique of her work as being based on "apparent personal preference rather than knowledge of the theory," while, as stratagem, presenting false dichotomies between quantitative and qualitative methods for artifice in contrasting approaches, merely for sake of constructing sanctuary.

As an initial matter, there is no distinction between research standards and expectations in qualitative or quantitative traditions. Factors impacting both quantitative and qualitative research studies do not discriminate by research approach. Indeed, factors such as history effects, maturation effects, experimenter bias, and regression to the mean can be equally damaging to the internal validity of qualitative or quantitative research studies, alike. Our focus is on validity of approach, collection, analysis and conclusion—-independent of theory choice.

Mendosa's use of "research tradition" as subterfuge for defending unreliable results is regrettable. Firstly, there is no quantitative research without qualitative perspicacity because if one is not well-versed in how to consider high context matters, framing any quantitative approach is impossible, save improbable luck. Second, our author group members, ironically, are trained in and have extensive experience in conducting and publishing valid qualitative research, teaching qualitative methods to Ph.D. candidates, business students, and law students. We also have a remarkable number of years of well-compensated practitioner experience in mentoring juniors in academia, military operations, business operations, and the law—in addition to our credentialing in quantitative methods. We are, characteristically, interdisciplinary and diverse bunch.

We do unapologetically champion standards-based approaches to drawing conclusions that could influence or inform any knowledge base, scientific, personal, or professional. We take special care when considering the national security—and in this case decisionmaking as it might relate to the training and education of intelligence officers. We take issue with Mendosa's implication that a well-intended peer review on an issue of significant consequence would be derived from an aversion to qualitative research, or other personal preference, but properly contextualize her quip as merely academic sniping.

Appropriately considered, the thrust of our critique emanates from observed flaws in Mendosa's research design (independent of theoretical framework, even if it were, arguing inuendo, improperly understood). The flaws, being fatal in nature, unfortunately (i) call into question Mendosa's study's results, and (ii) invalidate any recommendations that would be predicated thereupon. Mendosa's flawed data collection and analysis design betrays the fidelity of any subsequent recommendations that could follow, independent of the soundness or flaws of Transformational Learning Theory (TLT) as a theoretical framework, even though Mendosa purports in her response not to make generalizable recommendations.

Notwithstanding this, Mendosa tells us in her response that "Shenouda et al., would have valid procedural and causal concerns if the study had [stated findings that] were generalizable beyond the participants in the study." But Mendosa does in fact makes numerous recommendations "for intelligence professionals," for starters, even by virtue of her article's title. Mendosa declares that "Intelligence organizations must train, educate, and structure themselves to move beyond the traditional mechanistic views of leaders as people who occupy high-level positions and implement the will of the organization," (25) explicitly offering recommendations that potentially implicate the national security apparatus, with no explanation as to where these recommendations come from, or how they are linked to the results of her research.

While Mendosa claims in her response that she does not attempt to draw causal inferences between TLT and her research conclusions, on page 25 of her original piece she calls out her students' growth between Time 1 and Time 2 of administering her test questionnaires, asserting that TLT is responsible for explaining such growth. There is no way to tease this conclusion apart from one founded in fact and theoretically grounded, or from one stemming from simple experimenter interpretive bias. In the conclusion of her original article, Mendosa also states that "[T]hese patterns could potentially have relevance to intelligence professionals beyond the individuals sampled here" (Mendosa, 25). We do not know of any research tradition or profession in which the making of recommendations based on observations of one kind or another are not efforts to prescribe in generalization.

Conclusion

In his seminal work, *The Philosophy of Social Science*, Richard S. Rudner explains that “gaining knowledge” takes place within two contexts, the context of discovery and the context of validation. Rudner explains that the context of discovery is akin to qualitative research, encapsulating intuition, philosophy, and personal experience to gather information. However, Rudner goes on to suggest that information can only become knowledge through the process of validation, which requires controlling for threats to validity. In failing to implement necessary

controls that curb such threats, Mendosa’s study has fallen short.

Our group’s response is an invitation for Mendosa to validate her study via a contemporary, mixed methods approach that encompasses both qualitative and quantitative methods. Because regardless of research tradition, a glaring question remains—do we want decisions affecting our intelligence officers and national security organizations to be guided by validated scientific results, or merely by something to think about?

