

**CRITERION-RELATED VALIDATION OF THE CORE LOTI LEVELS:
AN EXPLORATORY ANALYSIS**

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Introduction

The new Levels of Teaching Innovation (LoTi) Framework, previously known as Levels of Technology Implementation, is a 21st century educational model designed to capture classroom teachers' digital-age literacy in keeping with the National Educational Technology Standards for Teachers (NETS-T) (<http://www.loticonnection.com/lotilevels.html>). As the most recent iteration of an ongoing developmental process begun by Dr. Chris Moersch in 1994, the Levels of Teaching Innovation Framework is rooted in the previously content- and construct-validated LoTi Survey for inservice teachers that led to creation of the DETAILS Survey (<http://www.loticonnection.com/validandreliable.html>).

At present, this framework is used to create data-driven professional development plans for teachers as they seek to provide meaningful technology-based learning experiences for their students. In order to accomplish this objective, each teacher receives a final “LoTi” score based on a series of multi-step calculations that capture how frequently he/she reports certain activities occurring in the classroom. These final Levels of Teaching Innovation scores are then expressed through the eight original LoTi Levels that align with the new LoTi Framework. The first four levels (Awareness, Exploration, Infusion, Integration: Mechanical) represent the core factors, while the remaining levels (Integration: Routine, Expansion, Refinement) are an extension of the Integration subcategories (<http://www.loticonnection.com/lotilevels.html>).

While the components of the new LoTi Framework have demonstrated both content and construct validity as per the aforementioned validation study, the degree to which the framework coordinates with an external measure of K-12 educators' “teaching innovation” proficiency has not yet been established empirically. This step is especially important for instruments that depend solely on participant responses (Standards for Educational and Psychological Testing,

1999). Therefore, the current study seeks to demonstrate exploratory criterion-related validity for the core LoTi Level scores as a key component of the new LoTi Framework.

Methodology for the Criterion Validation Analysis

Participants and Procedure

For this preliminary study, data were obtained from a total of 3,556 teacher surveys representing 125 elementary and secondary schools from 10 largely urban and suburban districts in Texas. These schools were selected because Texas's technology evaluation process for teachers closely mirrors both the original and new LoTi Framework. In keeping with the Texas Long-Range Plan for Technology, 2006-2020, all teachers are required to complete the Teacher School Technology and Readiness (STaR) Chart, a rubric-based assessment that measures teachers' levels of technology implementation in four key areas: 1) teaching and learning; 2) educator preparation and development; 3) leadership administration and instructional support; and 4) infrastructure for technology. The STaR Chart captures four levels of progress: 1) Early Tech, 2) Developing Tech, 3) Advanced Tech and 4) Target Tech (<http://starchart.esc12.net/>). These levels align conceptually with the first four LoTi Levels (which represent the core focus of the LoTi Framework, since anything higher than Level 4 is simply further refinement of the skill sets in this level. Scoring of the STaR Chart is also similar to the multi-step process used to obtain the final LoTi Levels, with results from six different categories tallied to produce the final STaR Chart level.

Statistical Analysis

The statistical analysis consisted of two parts. First, the within-school frequency distribution of STaR Chart and core LoTi Level scores was compared using separate z tests for proportions, with the assumption of a direct correspondence in content between the two

instruments' levels (e.g., the STaR Chart Early Tech level captures the same information as LoTi Level 1).

Second, since the STaR Chart and core LoTi Level data being compared were collected at approximately the same time in the spring of 2008, concurrent criterion-related validity was assessed. Given the ordinal nature and skewed distribution of both the STaR Chart and core LoTi level data, a Spearman's rank correlation coefficient, r_s (Hollander & Wolfe, 1999) was used to correlate ranked scores for both measures using SPSS version 14. This statistical test is similar conceptually to the standard Pearson's correlation coefficient r , with the difference being conversion of raw scores to ranks prior to the analysis. For all analyses, a Bonferroni-adjusted p -value $\leq .01$ denotes a statistically significant association due to the multiple comparisons.

Results

The vast majority of reported STaR Chart levels in the 125 schools were Developing Tech (110/125, or 88%), followed by Advanced Tech (9/125, or 7.2%); Early Tech (5/125, or 4%); and Target Tech (1/125, or .8%). The core LoTi Levels were similarly distributed in the 125 schools, with the vast majority at Level 2 (106/125, or 84.8%), followed by Level 3 (12/125, or 9.6%); Level 1 (6/125, or 4.8%); and Level 5 (1/125, or .8%). Based on separate z tests for proportions, none of these score distributions were significantly different (all p -values $> .05$).

Results of correlation analysis revealed a strongly significant positive association between the STaR Chart and core LoTi levels ($r_s = .704$, $p < .0001$). The corresponding Pearson's correlation coefficient $r = .767$ ($p < .0001$) supports this finding, which indicates that the two instruments share a robust degree of overlap in terms of what they are measuring, thereby providing initial evidence of the core LoTi Levels' criterion-related validity.

Conclusions

The fact that the core LoTi Levels demonstrate external validity based on a large number of educators from a diverse range of school districts speaks to the appropriateness of the levels in accurately capturing K-12 practitioners' teaching innovation. To further reinforce and strengthen these exploratory results, future data collection from additional school systems is being planned.

References

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