

# The Development of Online Learning Style Inventory: An Exploratory Study

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**Abstract:** This study intends to develop an online learning styles inventory. We first developed 168 items, and 105 items were selected for the pilot study, then finally 64 items were chosen for the main study. In order to improve the reliability and validity of the subscales, continuous empirical study is required.

**Keywords:** Learning style, inventory development, online learning, distance education

## Introduction

Many countries have adopted e-learning into school education and life-long learning. However, is it suitable for all college students to take online learning courses? As different learning styles would affect students' learning effects, the present study recognized the importance to design an online learning styles inventory. Accordingly, instructors may use the outcome of the inventory to design effective online learning courses for students of different learning style preferences.

## Methodology

With reference to learning style categories in related learning style tests ([1], [2], [3], [4], [5]) and considering online learning feature (e.g., the unrestricted time and location and use of multiple media elements), we identified three categories consisting of 15 factors in the learning styles inventory: Perceptual types: 1. Text; 2. Visual; 3. Auditory;; 4. Active. Cognitive processing types: 1. Abstract; 2. Concrete; 3. Serial; 4. Random; 5. Holistic/Global; 6. Analytic. Personality types: 1. Study alone; 2. Study with group; 3. Guided; 4. Persistence; 5. Observer.

The original 168 items were assessed twice by three scholars in the related fields to achieve content validity. After items were modified according to their feedback, the inventory was administered to five undergraduate students from different colleges in Taiwan. Finally, from their response opinions and responses, 105 items were selected for the pilot test. A total of valid 372 questionnaires were returned from 10 universities in different areas of Taiwan.

## Results and Discussion

Based on the results of the factor analysis and researchers' judgment, 64 items were

selected from 105 items, with four to five items for each learning style.

Results from pilot sample internal consistency showed higher reliability, close to .60 or .70, in Active, Abstract, Concrete, Study alone, Study with group, Guided, and Observer styles. However, lower validity, mostly less than .50, was shown in Auditory, Serial, Random, Holistic/Global styles. Results were similar to the low reliability coefficients in the learning style inventories developed by Dunn and Kolb [6].

When we take out the 64-items from the 105-items inventory using the 372 pilot samples, we found those with lower Cronbach's  $\alpha$  (those less than .50) were found improved. Theoretically, with other factors remaining constant, Cronbach's  $\alpha$  is lower with less items. However, in our study, when we reduce the items from 105 to 64, This indicates the reduction of items improved the reliability of internal consistency.

The coefficients of the 5-week test-retest reliability (using 64-items from 35 humanities undergraduates in a private university samples) found only "Active", "Holistic/Goal" was less than .50, the Pearson correlation coefficients of the other 13 learning styles were more than .50.

## Conclusion and Recommendations

In the present study, we made an attempt to develop an online learning styles inventory with 15 factors. We began our development with 168 items, then 105 items were selected for pilot study.

After factor analysis and researchers' judgment, 105 items were reduced to 64 items (4 to 5 items in each factor). Learning style factors with lower reliability value in the 105-item scale showed increase in the revised 64-item scale. A new sample for the 5-week test-retest reliability analysis was conducted, the Pearson correlation coefficients showed 13 of 15 learning styles were more than .50.

Study on reliability of the present learning styles inventory is at the beginning phase. In order to improve the reliability and validity of the subscales, continuous empirical study is required. We hope to offer the present inventory to help instructors or online learning course designers understand students' learning styles, as a reference to design suitable course and teaching methods. However, it should not be used exclusively for student selection or categorization.

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