

## **Italian adaptation of the Kolb's Learning Styles Inventory-2: A preliminary study**

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### **Abstract**

The ability to understand Learning Styles, provided by Kolb's studies, suggests that the instrument can be used on the Italian population in a translated and adapted form. In this study, correlational and factorial re-analysis, in line with the psychometric evidence in the literature, shows how the four scales, Abstract Conceptualization (AC), Concrete Experience (CE), Reflective Observation (RO), Active Experimentation (AE), come together as in the original Kolb's hypothesis, in a bipolar dimension. The assessment of the Learning styles applied to the students of Medicine and Surgery, is interesting for the many different approaches into medical science and different professional choices.

Key words: Learning styles, LSI-2, Psychological types.

## Introduction

The Kolb's Learning Style Inventory-2 (1985), is an improved version of the original work, whose purpose is to study the learning styles. The inventory is based on Kolb's theory of experiential learning (1976) which suggests different degrees upon concrete experience, reflection, abstraction and experimentation. His model is founded on Jung's concept of types (Jung, 1921) or styles where development is accomplished by higher level integration and expression of not-dominant modes of dealing with the world (Loo, 1999). In this way, the research has highlighted four internal scales to the instrument, respectively Concrete Experience (CE), Abstract Conceptualization (AC), Reflective Observation (RO) and Active Experimentation (AE). The scales refer to new situations and experiences, in particular: CE refers to the interpretation or reinterpretation of new experience; RO gives importance to any inconsistency between experience and understanding; RO rises to a new idea or alternation of an abstract concept existing; AE involves the learning about external application to get results.

Several studies have analyzed the characteristics, including Willcoxson and Prosser (1996) providing that factor analysis suggests a bipolar dimensions, AC-CE and AE-RO. Other authors suggested the possibility that the factors were three and that you could not bring the results of factor analysis to the bipolar dimension (Yahya, 1998), while confirming the Willcoxson and Prosser's analysis, the two factor solution was found to be preferable.

The factor analyses suggested full evidence that the validity of the Kolb's instrument was based precisely on the bipolar dimension. The purpose of the present work is that of adaptation of the instrument in the Italian language, the way through which it will be possible to highlight the psychometric properties and extend the use of the Italian population.

## Method

The group of observation consists of 104 subjects attending the V year of Medicine and Surgery at the University of Messina, respectively, with female dominance (51.9%) on male group (48.01%). Factor and correlation analysis of the four scales, CE, RO, AC, and AE, was obtained with SPSS 16.0 for Windows.

## Results

The first analysis (Table 1, 2) deals with a descriptive and correlational study of the whole observation group to observe the behavior of the four scales with reference to the original analysis of Kolb (1984) and subsequent studies (Wilcoxson, Prosser, 1996; Yahya, 1998).

*Table 1 Descriptive Statistics*

|                    | N   | Mean  | Std. Deviation |
|--------------------|-----|-------|----------------|
| AC-CE              | 104 | 60,02 | 6,497          |
| AE-RO              | 104 | 59,87 | 6,436          |
| Valid N (listwise) | 104 |       |                |

*Table 2 Correlations*

| <i>Scale</i> | CE | RO     | AC   | AE     |
|--------------|----|--------|------|--------|
| CE           |    | -368** |      |        |
| RO           |    |        | -112 |        |
| AC           |    |        |      | -397** |

\*\* . Correlation is significant at the 0.01 level (2-tailed).

As it is known in Wilcoxon and Prosser' s re-analysis studies (1996), correlation analysis suggests a bipolar dimension involving AC with CE and subsequently AE with RO.

Factorial analysis with varimax rotation procedure, conducted on the whole observation group and with particular reference to the previous correlation analysis (strong bipolar dimension AC-CE, AE-RO), validates the current hypothesis (Table 3 , 4, 5).

*Table 3: Total Variance Explained*

| Component | Initial Eigenvalues |               |              |
|-----------|---------------------|---------------|--------------|
|           | Total               | % of Variance | Cumulative % |
| 1         | 1,685               | 42,135        | 42,135       |
| 2         | 1,223               | 30,579        | 72,714       |
| 3         | 1,073               | 26,825        | 99,539       |
| 4         | ,018                | ,461          | 100,000      |

Extraction Method: Principal Component Analysis.

*Table 4: Rotated Component Matrix<sup>a</sup>*

|     | Component |       |       |       |
|-----|-----------|-------|-------|-------|
|     | 1         | 2     | 3     | 4     |
| C E | -,202     | -,183 | ,961  | -,048 |
| R O | -,071     | ,974  | -,214 | -,024 |
| A C | ,940      | -,117 | -,322 | ,002  |
| A E | -,636     | -,561 | -,416 | ,329  |

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 13 iterations.

*Table 5: Component Transformation Matrix*

| Component | 1     | 2    | 3     | 4     |
|-----------|-------|------|-------|-------|
| 1         | ,680  | ,578 | -,439 | -,108 |
| 2         | -,047 | ,598 | ,769  | -,222 |
| 3         | -,716 | ,538 | -,429 | ,114  |
| 4         | ,150  | ,139 | ,179  | ,962  |

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

## Discussion

The perplexities referred by the different authors regarding the coupling of scales in a double dimension are perhaps more susceptible to the name attributed to the scales by Kolb than to the content they represent. As suggested by Yahya (1998), the confusion produced by the combination of abstract-concrete terms, suggested recursive practices, with different observation groups. The results suggest that the original pair remains in force and can be considered as a good method of analyzing learning styles. Ultimately, as suggested by the authors, the first coupling, Attentive Attitude (AE) & Reflective Observation (RO), respectively, is a typically transformative dimension. The second pair, respectively, consisting of Abstract Conceptualization (AC) & Concrete Experience (CE), is more oriented towards perceptual prerogatives.

This knowledge applied i.e. to the students of Medicine and Surgery is interesting for the many different approaches into medical science, which ultimately translate into different professional choices. In fact, professional medical training is merely generic, a medical graduate can go through different ways in which each of the attitudes studied can prove to be important. For example CE is interesting for surgical practice; AC for research; RO for psychiatric practice; AE for laboratory studies. Evidently all four skills are needed, but it is in the prevalence of one of them that one can express the talent.

## Conclusion

Knowing it together with information and training is useful to medical students and can help to reflect on their learning styles that, together with other tools we use, such as the Myers-Briggs Type Indicator (Myers, 1962), enhance the student's awareness of the searching for an individual course, finding answers in accordance with professional wishes.

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## Appendix 1. Kolb's LSI- Italian adaptation

|                                  |  |                                   |   |  |
|----------------------------------|--|-----------------------------------|---|--|
| <b>1. Quando apprendo</b>        | Preferisco essere in accordo con i miei sentimenti | Preferisco ascoltare ed imparare  | Mi piace pensare alle idee                                    | Mi piace essere attivo                       |
| <b>2. Apprendo meglio quando</b> | Mi fido delle mie impressioni e sentimenti         | Ascolto con cura e guardo         | Mi rivolgo al pensiero logico                                 | Mi impegno fortemente per completare le cose |
| <b>3. Quando sto apprendendo</b> | Sperimento forti sentimenti e reazioni             | Sono calmo e riservato            | Tendo a ragionare sulle cose                                  | Sono responsabile in riferimento alle cose   |
| <b>4. Apprendo attraverso</b>    | Sentimenti   | Stimoli visivi                    | Il pensiero   | L'azione                                     |
| <b>5. Quando apprendo</b>        | Sono aperto/a a nuove esperienze                   | Valuto tutte le immagini sul tema | Mi piace analizzare le cose, riducendole in parti più piccole | Mi piace sperimentare                        |
| <b>6. Quando sto apprendendo</b> | Sono una persona                                   | Sono una persona che              | Sono una persona  | Sono una persona                             |

| <b>o</b>                             | intuitiva                            | osserva                            | logica                     | attiva                                      |
|--------------------------------------|--------------------------------------|------------------------------------|----------------------------|---|
| <b>7. Apprendo meglio attraverso</b> | Relazioni con le persone             | Osservazione                       | Teorizzazione e razionale  | La possibilità di provare e praticare       |
| <b>8. Quando apprendo</b>            | Mi sento personalmente e coinvolto/a | Prendo il mio tempo prima di agire | Mi piacciono idee e teorie | Mi piace vedere i risultati dei miei lavori |
| <b>9. Apprendo meglio quando</b>     | Mi riferisco ai miei sentimenti      | Mi riferisco all'osservazione      | Mi riferisco alle mie idee | Posso sperimentare e fuori dalla teoria     |
| <b>10. Quando sto apprendendo</b>    | Sono una persona aperta              | Sono una persona riservata         | Sono una persona razionale | Sono una persona responsabile               |
| <b>11. Quando apprendo</b>           | Vengo coinvolto/a                    | Mi piace osservare                 | Valuto le cose             | Mi piace essere attivo/a                    |
| <b>12. Apprendo meglio quando</b>    | Sono ricettivo/a e di mente aperta   | Sono prudente                      | Analizzo le idee           | Sono pratico/a                              |
| <b>Punteggi totali</b>               |                                      |                                    |                            |   |