SPEARMAN CORRELATIONS BETWEEN LEARNING STYLES FROM RATIONAL LEVEL AND GARDNER INTELLIGENCE TYPES[*]

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Abstract

Perspectives on education are changing and expanding beyond the classroom, to an augmented environment, where are facilitated processes such as information access, expert opinions on the same subject, detailed analyzes of certain aspects, etc. This extension implies in different ways both teachers and learners in relation to the variety of learning styles and types of intelligence presented by H. Gardner. In current learning offerings and information access opportunities, students can effectively use their natural inclinations (converted to styles) to exploit learning, analyze information that is uninfluenced by aspects of a particular group, develop collaborative personality traits, and these aspects may indirectly cause teachers to adapt the methods used for the class. The purpose of the research is to observe the possible correlations between learning styles that predominantly use rational area from Kolb and Honey-Mumford models and Gardner intelligence types. Observing these correlations teachers can be helped in better understanding of students' attitudes towards the educational process.

Key-words: *Learning style, types of intelligence, correlations*

1. INTRODUCTORY CONSIDERATIONS

At the present, speciality studies have synthesized about 71 patterns of learning styles, 13 of them being more common (Coffield et al., 2004). Within these models, cognitive style and learning strategies can change depending on various factors and contexts of learning places. The classification of these styles is usually done on three levels: the sensory or perceptual level, which presents the styles according to the predominant implied or dominant receptor; the level of information processing, which relates to how information is decoded, memorized,

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analyzed and used later to solve problems, leaving its mark on certain analytical or global attitudes, values and interpretations of events; and the mixed level when equivalence between the used receptors and equality between specific information processing functions or the first two levels interrelate and give rise to what is called the „personal style of learning" (Semionov, 2011), or naturally results a combination of existing styles (Focşa-Semionov, 2009).

David Kolb has made a classification of learning styles in relation to the external environment, styles that represent the best adaptation of the individual to the world around him, and so these styles symbolize the form of resolving the tension between the adaptation modalities and the solutions found (Kolb, 1981). The typology of the psychological characteristics of learning proposed by D. Kolb uses four styles or forms, namely concrete experience, reflexive observation, abstract conceptualization and active experimentation. The four learning styles based on concrete experience, reflected observation, abstract conceptualization and active experimentation can be treated either individually (in the case of the first model) or by combining them. Thus, we can have: the divergent style (obtained from the combination of the concrete experience + reflected observation); assimilation style (obtained from the combination of reflected observation + abstract conceptualization); the convergent style (obtained from the combination of abstract conceptualization + active experimentation) and the acomodor style (obtained from the combination of active experimentation + concrete experience).

The Honey-Mumford Model. This model started by working on Kolb's model and adding higher levels through which the individual perceives, processes and represents the information. Thus, four styles were developed as individual learning preferences: theoreticians, pragmatics, activists and reflectives (Bernat, 2003; Duff, 2001; Penger & Tekavčič, 2009).

From the perspective of use and addressability of learning styles, the models developed by D. Kolb and Honey-Mumford are thought to be models that address and evaluate the capacity for rationalization, analysis, comprehension and information processing (Bernat, 2003;Cassidy, 2004). These models along with Gardner's multiple intelligence model are vital features in the process of acquiring information.

Howard Gardner's multiple intelligence theory is considered to be one of the most remarkable access of the human psyche. Gardner has defined intelligence as „the ability to solve problems or to create products that are valued by multiple cultures" and this definition, as Gardner continues, „does not say anything about the sources of these abilities or appropriate means of" testing „it." (Gardner, 2011). In fact, Gardner has proposed three distinct uses of the term intelligence: a property of all human beings, a dimension that differentiates human beings and a way in which a certain activity takes place (by virtue of the proposed goals) (Gardner, 2011). Building on this definition and on these distinctions, eight different criteria for multiple intelligences have been outlined on the basis of

biological and anthropological evidence (Gardner, 2011). Thus, eight types of intelligence have been identified: verbal / linguistic intelligence, logical / mathematical intelligence, visual / spatial intelligence, body / kinesthetic intelligence, musical / rhythmic intelligence, interpersonal intelligence, intuitive intelligence and naturalistic intelligence (Gardner, 2006). These are also different ways to discover and explore the environment, ways that have been labeled by Gardner as human intelligence (Armstrong, 2009; Gardner, 2011; Rizeanu, 2016).

2. OBJECTIVES AND IPOTES

The objective of the research is observation of the possible correlations between rational learning styles and Gardner intelligence.

Research hypothesis: There are Spearman correlations between rational learning styles and Gardner intelligence types among students at the faculty of psychology.

3. METHOD
3.1. PARTICIPANTS

In this research participated 101 students from the Faculty of Psychology at Hyperion University in Bucharest.

3.2. INSTRUMENTS

- The Kolb questionnaire contains 12 items with four answer possibilities;
- The Honey-Mumford Questionnaire (Serea, 2006), (MAAN and A.N.F.P:, 2012), (Pasaniuc, 2014), (weebly) contains 80 items with a single answer. At the end, the points (or ticked items) are added and the predominant style is deduced from the following scales:

Tabel 1 – Honey-Mumford model scales

Active	Reflexive	Theorist	Pragmatic	Scale
13-20	18-20	16-20	17-20	Very strong preference
11-12	15-17	14-15	15-16	Strong preference
7-10	12-14	11-13	12-14	Moderate preference
4-6	9-11	8-10	9-11	Low Preference
0-3	0-8	0-7	0-8	Very low preference

- The questionnaire of the eight types of intelligence has 80 items (Bernat, 2003;Dediu, 2010) and aims to frame the subjects in one of eight types of intelligence (Bernat, 2003) proposed by Howard Gardner (Gardner, 1991), namely: verbal / linguistic intelligence; logical / mathematical intelligence; visual / spatial intelligence; body / kinesthetic intelligence; musical / rhythmic intelligence; inter-personal intelligence; Intra-personal Intelligence and Naturalistic Intelligence (Gardner & Moran, 2006). Depending on the score, the subjects are framed by the

dominant intelligence type, with no interpretations of scores within each type of intelligence, but only the predominance of a certain type of intelligence. Multiple intelligences can also be understood as different ways of learning. In general, the education system tends to favor two of these ways: the logical / mathematical and the verbal / linguistic. Each of the learning modalities involves specific abilities (Bernat, 2003).

3.3. EXPERIMENTAL DESIGN

The design of the research consisted in the application of the questionnaire and later the data obtained were processed in SPSS v.22.

4. RESULTS

Spearman correlations between the models of Kolb and Honey-Mumford, on one hand, and Gardner's intelligence, on the other hand, were designed to determine the possible correlations between ranks between learning styles and types of intelligence.

Tabel 2 – Synthesis of intelligence types and measured styles based on which Spearman correlations were made

The type of intelligence	Style measured
Verbal / linguistic intelligence	Divergent style (CE / RO)
Logical / mathematical intelligence	Asimilator style (AC / RO)
Visual / Space Intelligence	Convergent style (AC / AE)
Body / kinesthetic intelligence	Acomodor style (CE / EA)
Musical / Rhythmic Intelligence	Active
Intelligence inter-personal	Reflexive
Intra-personal Intelligence	Theorist
Naturalist intelligence	Pragmatic

According to Spearman's correlation analysis, types of intelligence correlate with various styles in different proportions as follows:

Verbal-linguistic intelligence has a positive correlation (median proportional relation between values) of mean intensity with Reflexive (Honey-Mumford) (ro = 0.445, p = 0.000, N = 101).

The logic-mathematical intelligence has a positive correlation of low-intensity correlation with Reflexive (Honey-Mumford) (ro = 0,382, p = 0,000, N = 101) and with Theoretician (Honey-Mumford) (ro = 0.296, p = 0.003, N = 101).
Visual-space intelligence has a positive correlation of low intensity with Reflexive (Honey-Mumford) (ro = 0.300, p = 0.002, N = 101).

Inter-personal intelligence has a positive correlation of low intensity correlation with Reflexive (Honey-Mumford) (ro = 0.391, p = 0.000, N = 101) and Pragmatic (Honey-Mumford) (ro = 0.255, p = 0.010, N = 101).

Intra-personal intelligence has a positive correlation of mean intensity with Reflexiv (Honey-Mumford) (ro = 0.412), p = 0.000, N = 101), positive intensity correlation with Active (Honey-Mumford) = 0.014, N = 101) and with Pragmatic (Honey-Mumford) (ro = 0.224, p = 0.024, N = 101).

Naturalist intelligence has a positive average intensity correlation with Reflexive (Honey-Mumford) (ro = 0.526), p = 0.000, N = 101); positive correlation of low intensity with Theoretician (Honey-Mumford) (ro = 0.228, p = 0.022, N = 101).

Otherwise, the 8 types of intelligences had insignificant positive or negative correlations and varied intensities with other learning styles.

5. CONCLUSIONS

In constantial research and in relation to the assumed objective, the results obtained have shown that in Kolb we do not have any type of intelligence that correlates with the learning styles. For the Honey-Mumford model three medium intensity correlations and eight low intensity correlations were obtained between six types of intelligence and four learning styles. Thus, we can conclude that the assumed hypothesis has been validated.

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