

Pre-service Secondary teachers' learning styles

R. Sanz Ponce¹, I. Hernando Mora²

^{1,2}Universidad Católica de Valencia "San Vicente Mártir"

Abstract: Every student copes with his own learning in a particular way and teaching style can determine learning style. This research is developed at a Faculty of Education Sciences where pre-service teachers are being trained. The aim is to analyze the different students' learning styles in the Master for Secondary Teachers' Training. We have used the VARK Questionnaire that includes 4 different learning styles (or sensory modalities): visual, aural, read/write, and kinesthetic. Participants, who were graduated in different degrees, studied in 9 different specialities of the master at Catholic University of Valencia. Results indicated that girls were more likely to prefer a read/write learning style than boys. Furthermore, the most important learning style was aural one, irrespectively of specialities. We conclude that our results can be caused by Master classes, in which students listen to the teacher and teacher explains without a feed-back. Differences among these findings and other researches are discussed.

Keywords: Learning styles, teachers, VARK Questionnaire, Master for Secondary Teachers' Training.

Introduction

Right to Education is not attending to school but learning (UNESCO, 2013). That means that there must be "learning" to consider the educational process as right (Piaget, 1974), to recognize the right to Education. That is why there are many researches who test teachers' practices and learning processes (Bain, 2006; Jarante y Medina, 2012; Escámez, 2013).

Every student copes with his own learning in a particular way. Knowledge about different learning styles can help to enhance achievement and motivation (Hervás, 2003; Martín y Rodríguez, 2003; Martínez-Fernández y García-Ravidá, 2012), to adapt teaching style in order to enhance educational process.

In this respect, a teacher must think about his own learning style and how this one determines his teaching style. The way in which a teacher learns determine the way in which he teaches. In addition, his styles affect the way in which their students learn (Martínez, 2007).

Learning styles are the strategies or methods which a person uses to learn. These strategies are often stable but they depend on context and activities, and can be raised and changed (Revilla, 1998; Vermunt, 1996). Cognitive, emotional, and physiological features affect the way in which a person responds to the learning (Keefe, 1988). Castro and Guzmán (2005) introduced sociological and psychological factors as features that determine the different styles. Other authors explain that learning styles are a set of variables, half way between intelligence and personality that affect the way of learning (Camarero, Martín y Herrero, 2000). Teachers must bear in mind all of these essential factors to adapt their teaching styles to their students' learning styles (Martínez Geijo, 2007).

The purpose of the present study was to test the students' learning styles in Secondary Teachers' Training Master.

Material and Methods

The profile of student's learning preferences was assessed by *VARK* Questionnaire (Fleming & Mills, 1992; Fleming, 2006). This Questionnaire provides 16 questions and 4 options for every question because of there are 4 *VARK* modalities: Visual, Aural, Read/Write and Kinesthetic (Fleming, 1995; Fleming y Baume, 2006). Besides there are multimodal (bi, tri and tetra-modal) learning models, each respondent can choose more than one answer for each of the questions.

Participants were students from Secondary Teachers' Learning Master of the Catholic University of Valencia who were graduated in different degrees (Table 1) at some universities of Valencia (Spain). A total of 9 classes (one class for every speciality) were invited to participate in the investigation. The final sample consisted of 262 students (88,2% of the total population), 36,7% male and 63,3% female. The study was conducted between October and December of 2014.

The data were collected in 15 minutes sessions. An investigator administered the questionnaire to the students and gave instructions to fill out it.

Table 1: Percentage of participants

Master for Secondary Teachers' Training specialities	Enrolment	Participants	%
Business and Economy	26	25	96,1 %
English	40	34	85 %
Biology and Geology	31	30	96,8 %
Physical Education	34	30	88.2 %
Geography and History	36	25	69,4 %
Language and Literature	43	40	93,0 %
Mathematics	37	36	97,3 %
Technology	33	31	94,0 %
Educational Guidance	17	13	76,5 %
TOTAL	297	262	88,2%

Frequency analysis, Chi-square tests, and Least Square Means were calculated with SPSS/PC.

Results and Discussion

Figure 1 shows the frequency of different modalities. Chi-square analysis did not indicate significant differences between our distribution and a random distribution ($p = 0,0527$).

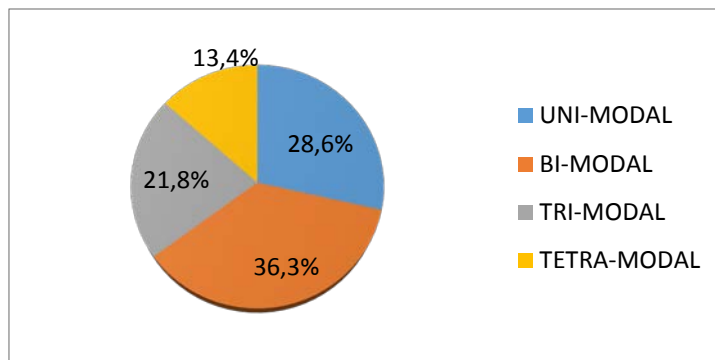


Figure 1. Students' distribution according to modalities.

Table 2 shows that the most frequent uni-modal learning style is the Aural one (58,6%) and the most frequent bimodal learning style is the AK one.

Table 2. Frequency of different modalities.

UNI-MODAL		BI-MODAL		TRI-MODAL		TETRA-IMODAL	
V weak	2	VA	4	VAR	4	VARK	35
V strong	1	VR	4	VAK	11		
A weak	20	VK	4	VRK	3		
A strong	24	AR	20	ARK	39		
R weak	5	AK	44				
R strong	2	VK	19				
K weak	11						
K strong	10						
TOTAL	75		95		57		35

According to Horton, Wiederman y Saint (2012) most students have multi-modal styles, irrespective of sex. Wehrwein, Luján y DiCarlo (2006), instead, reported that most girls have uni-modal styles and most boys have multi-modal styles. Because of there are more multi-modal than uni-modal styles, students appear to be less likely to show an uni-modal style. We believe that it is more important to know what the most favourite learning styles of students are.

Because of the preferences are weaker when combined we have calculated V, A, R, and K proportions. Each single answer counts as 1.0, each double answer counts as 0,5, each triple answer counts as 0,33, and each quadruple answer counts as 0,25. There is not a clearly predominant style: 16,6% of students are classified as Visual, 32,2 % as Aural, 22,8 Read/Write and 28,4% as Kinesthetic.

Table 3 gives the percentages of V, A, R, and K profiles and the percentages of uni-modal, bi-modal, tri-modal and tetra-modal preferences in every Master speciality.

Tabla 3. Percentages of every learning style and every modality

ESPECIALIDAD	LEARNING STYLES				MODALITIES			
	V	A	R	K	Uni-modal	Bi-modal	Tri-modal	Tetra-modal
Business and Economy	16%	36%	22%	26%	24%	44%	24%	8%
English	16%	34%	23%	27%	19%	36%	26%	19%
Biology and Geology	18%	32%	21%	29%	43%	24%	24%	9%
Physical Education	17%	32%	24%	27%	45%	31%	24%	0%
Geography and History	16%	31%	22%	31%	32%	20%	28%	20%
Language and Literature	14%	32%	26%	28%	25%	50%	12%	13%
Mathematics	19%	29%	23%	29%	9%	48%	26%	17%
Tecnology	16%	33%	23%	28%	39%	35%	13%	13%
Educational Guidance	17%	33%	20%	30%	31%	23%	15%	31%

The most frequent modalities are uni-modal and bi-modal ones. The most frequent style is the Aural one at all specialties. This learning style is maximum in Business and Economy (36%). The least frequent style is the Visual one, whose maximum is 19% in Mathematics. Kinesthetic style is maximum in Geography and History (31%). Read/Write style is maximum in Language and Literature speciality, in which Visual style is minimum. Despite that, we did not find significant differences among specialties. The most important one is the Aural style. Furthermore, all the participants are graduated. That means that they are, at least, twenty years old. If we take into account that master class is the most important teaching style in Spain for last few decades in almost any degree, we believe that this teaching style has could determine the students' learning style irrespectively of their initial learning style. According to Revilla (1998) and Vermunt (1996), their learning style has could be changed.

Results from the Least Square Means analysis exploring for possible sex differences, revealed that girls are more likely to prefer a Read/Write style than boys (24,1 and 21,6 per cent, respectively). Horton et al. (2012) reported similar results (28,9 and 25,3 per cent, respectively). Instead, Dobson (2009) found that boys tended to prefer a Read/Write learning more than girls.

There are no more significant differences in the rest of styles.

Tabla 4. Ls means by sex

Learning style	Sex	LS Mean	Std Error	p
Visual	0	16,3639	0,9567	0,8221
	1	16,6347	0,7292	
Aural	0	32,7649	1,1958	0,6147
	1	32,0072	0,9114	
Read-Write	0	21,5649	1,0102	0,0471*
	1	24,0982	0,7699	
Kinestthetic	0	29,3165	1,0526	0,1245
	1	27,2766	0,8022	

Note. Sex 0 = male, Sex 1 = Female; LS mean = Least Square Means; Std Error = Standard Error; p = Probability of error; *Significant difference.

Conclusions

Martínez Geijo (2007) pointed out that teachers generally used the text book and the master class as the only teaching tools. This teaching style has determined the learning style of our students, who got used to learn in a very specific way for fair or fail. According to Rodríguez and Vázquez (2013), learning style of every teacher affects his teaching style which has an influence on his students learning style. Thus, our results can be caused by master classes, in which students listen to the teacher and teacher explains without a feed-back.

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