

Social Representations of Learning in Mexican High School Students: A Comparative Study

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ABSTRACT: *The quantity of studies of social representations in the field of Education in Mexico, is still lacking, then, understanding and interpreting the images and conceptions built by the Knowledge Society is a crucial point to make a more assertiveness Teaching intervention in students. The aim of this study was to compare the social representations on Mexican High School students by using the technique and theory of Natural Semantic Network (NSN). A cross-sectional and mixed paradigm study was made, it was used the method of research-action. There were included 77Mexican students from the first and second quarter of high school, which were divided into two different groups: first quarter and second quarter (FQ and SQ). Results showed that it exists similarities between the FQ and SQ social representations about the meaning of learn, with the words: learning, school and life (FQ and SQ M value = 71,40; 38,30; 30,13). The conclusion of the study was that students share social representations about learning, in three different categories: learn as a process, school and life.*

Keywords: *Social representations, learning, high school, natural semantic network, Mexico*

I. INTRODUCTION

Nowadays, education state of affairs in Mexico is controversial, some of the current politics are trying to make substantial changes on the educational system, but it is an opportunity to understand first the classroom process, because it is there were knowledge must be built by students and with the help of the teacher. In Mexico it does not exist too much information about social representations on the field of high school education, then, this study might be strength in order to improve the explanation of the educational phenomenon.

Cavallo (1993) affirms that Social Phycology, analyze the made up collective knowledge, taking meanings and mental constructions, being aware of the differences on the attitudes, believing's, stereotypes, or well know, the individual previously knowledge (Cavallo, 1993). This matches with the images built by the current *society of knowledge* (Torres,2014).

According to Serge Moscovici (1979, cited by Negursa,2006), whom introduced a new method on the knowledge exploration over the collective one, with his theory of Social Representations (SR) and the multiplicity and the multiplicity of experimental data, on the origin and organizations of those social representations, which can be merely varied, then, this representations and meanings are called by some current authors as social imaginaries (Torres,2014).

Teaching Sciences in high school, is not well-known on the Mexican culture, cause as it might be explained by some authors, the evolution of ideas is involved on the path of understanding the current marketing, and the with this, a progress could be restructured on the body of scientific information. (Alluin,2007). Inside the existing society, political decisions are trying to cover the lack of how to teach and learn sciences, and the with this developing educational competencies and techniques (Giordan,1994)

At the present time, in accordance with Giordan (1994), the democratic societies are in charge of making the best choice to insurance the education of democracy as a social regulation mechanism. Men nowadays, lives into a constantly transformative world, then the metaphysical explanations seem to be expired, in this way, traditional social values demand a restructuration and reformulation (Giordan, 1994). Other ways, social representations are taking an important lead on the comprehension of the educational processes (Torres,2014).

This article is organized on a first moment, with the theoretical framework and background about actual studies of social representations in Mexico, then on the second part, the complete methodology design, on the third section, the result analysis is stablished and at the end, the conclusion and discussion of the research.

In Mexico, the grasp of science teaching in high school is not enough yet, then, it is necessary to amplify the comprehension of currentstudent's mental constructions, and after this, interpret their meanings (Piña,2004)

The aim of this research was to compare the social representations on Mexican High School students by using the technique and theory of Natural Semantic Network (NSN), the scientific problem was design by the following research question: What differences exists on the social representation of learning in Mexican high school students with the usage of the Natural Semantic Network? It is important to mention that culture is a

main factor on the interpretation of the educational phenomenon, at that time, a better approach on this knowledge field is required. Hypothetically the difference might be categorized by the conceptions of teacher and books.

In this order of ideas, the interpretations of education in Mexican students over teaching and learning, is lacking, and these cognizance, was the study object of the research. It is expected that the present study can produce considerations on the built actions inside the classroom, and at the end, improve the own didactic practical skills, all this, framed on the reigning *society of knowledge*.

II. SOCIAL REPRESENTATIONS

Serge Moscovici is the creator of the definition of social representations on his book published in 1961 (cited in Piña, 2004) *The Psychoanalysis, its image and its public (La Psychanalyse, son image et son publique)* by Presses Universitaires de France and the Spanish version in 1979 by the Huemul Editorial in Buenos Aires, Argentina, in this book, Moscovici, exposed the characteristics of his Theory and technique (Piña,2004).

Social Representations according to Piña and Cuevas (2004) are defined as the incorporated thoughts of each person. In another view, Moscovici (1979) affirmed that this social representations or images can change on the modern society, but all the the organized collective thinking can be called social representations. (Piña & Cuevas,2004)

2.1 Social Representations on the field of Education in Mexico

In Mexico, does not exist an enough amount of studies that used Social Representations as method, product, technique or interpretative framework on the field of Educational research, (Piña & Cuevas,2004) the most important studies found currently are exposed on Table 1.

Table 1. Research studies in Mexico that applies NSN.

Year	Author(s)	Publication Title	Type of publication
1995	Cornejo, A.	High school students from CCH: perspectives of student 's and institutional life.	Thesis
1999	López, F.	The teacher: his education and popular image. National University Autonomous of Mexico (UNAM) (PhD thesis)	Thesis
2001	Almaguer, C. Piñones, L	Representations of junior high and elementary students, about the equality on education between poor and rich children. (Bachelor Thesis) UNAM	Article
2001	Macotella, S. Flores, C. Seda, I.	Beliefs of Mexican teachers on school and teaching role.	Article
2003	Piña, J.	Imaginaries Representations and identity, high education actors	Article
2013	Piña, J	Social representations of the Educational Reform	Article
2011	Limón, F	Social representations of scholar education between <i>Chuj</i> Mexicans.	Article

As it can be seen on Table 1, the number of studies in Mexico about social representations, is still low, and specially the ones that belongs to the Education field (Piña,2014). It is important to mentioned that the approach and theoretical manage of each study is related totally with the professional formation and experience of each of the researchers and also to the research line (Piña,2014).

2.2 The technique of Natural Semantic Network (NSN)

It is a technique of social research initially proposed by Figueroa, González and Solís (1981 ; cited in Valadez,2000) , it is a tool for studying the meanings of certainly words or expressions inside an specific social group (Valadez,2000).

Natural Semantic Network, has been used in different studies in high school students in Mexico, inside the fact sciences, like the study of García and Jiménez (1996), where the objective was to evaluate the representation and cognitive organization on high school students with the definitions of pressure and flotation in a Physics I course., the results showed that the NSN generated by students are more similar to professionals (García, 1996)

It existsother evidences on the current literature, where NSN were used, like the Zermeño research (2005) where the aim was to identify the psychological definitions of young people of the information and communication technologies, their life perspectives and the connection between both. In another research of González et.al (2012), the purpose was to identify the strategies that teenagers used for those ones under mental depression

The definition of Semantic Network is connected with the long term memory, which contents the comprehensive, perceptive, percussive, motor and prepositive knowledge (Hilagr&Bower ; cited in Vera-Noriega, 2005).

In accordance to Young (2001) the NSN has been demonstrated their utilities dot identifying the psychological meanings on different knowledge fields like; pedagogy, psychosociology, marketing, publicity and of course in Psychology.

Figueroa (1980, cited in Vera-Noriega,2005) proposed new essential elements for the utilization of NSN, these recommendations are exposed in Table 2.

Table.2 Essential elements for the usage of semantic networks (Figueroa,1980 ; cited in Vera-Noriega,2005)

a)	The technique study might be completely empirical
b)	The semantic distance may be quantified by a factorial analysis
c)	The network must be hierarchized
d)	Must be possible to study a network in every group since childhood.
e)	The meanings can be definition and fact as definitive at the same time.
f)	Avoid the artificial intelligence model
g)	It must be established a mutidimensioned model over time
h)	Use a multivariate analysis
i)	Interpret theoretically the information for designing a research with a neurophysiological code interpretation.

Settling the information of Table 2, NSN might expose the codifications based on a subject construction, allowing to make a more qualitative analysis and also having a statistically significance.

III. METHOD

The design corresponds to a mixed paradigm study, with the usage of the research-action method, and using the owns teacher practice, the understanding of the social mechanisms improves the practice of the teacher by applying this qualitative method (Álvarez-Gayou, 2005)

3.1 Participants

First of all, an intentioned non probabilistic sample was used, 79 Mexican students were included on the research, they were officially signed up into the institution by the time of the investigation, the general data of research population is presented on Table 3.

Table 3.Main characteristics of general research population

<i>n</i> = 77	Total population	Mean age of participants
Men	43 (55.84 %)	19.3 (+/- 4.54)
Women	34 (44.15 %)	19.3 (+/-4.54)

Data of table 3, showed that the main population was conformed by men, but according to the aim of this research, the genre might not have influenced on the interpretation of the social representations. Then another Table was made up in order to identify the characteristics in each group, then, Table 4 was generated.

Table 4. Population characteristics by group

Genre	Number of participants	Mean age	Academic level
<i>men</i>	32	15.53	First quarter (FQ)
<i>women</i>	21	18.04	
<i>men</i>	11	18.58	Second quarters (SQ)
<i>women</i>	13	22.53	

As it can be seen on Table 4, the mean age is over 18 on the second quarter (SQ) and women that belonged to the first quarter (FQ) group had a mean age of 15.53 which means that age could be a factor on the construction of social representations.

3.2 Instruments

One instrument was used, it was about a Questionnaire designed under the recommendations of the Theory and technique of NSN, the questionnaire was conformed by the stimulus word *learning*, students had a period of 5 minutes to list 10 words related with learning, after this, they had 2 minutes to organized them in order of importance, keeping the criteria of 1 for the most important trough the number ten for the less important. Instrument was applied according to the technique of Figueroa et al (1980)

The questionnaires were registered on a data base by using the software tool of Excel (Macintosh version), a pattern of more frequent answers was identified, the research instrument was applied in both groups

at the beginning of the quarter (week 1). Figueroa (1981) recommendations were considered for the quantitative analysis.

3.3 Procedure

In a first moment, questionnaires were applied with the FQ and SQ groups, the schedule for each group were different, in the school they are 2 schedules, the afternoon and night, the first one starts at 16:00 and finishes at 20:00, then in the night, started at 18:30 at finished at 21:00.

An initial explanation was given to the students, then on the first week of the quarter's course the tool was applied, then the questionnaires were collected by the researcher. The questionnaires were applied on Chemistry class. Students from SQ were instructed by the researcher a quarter before the investigation.

IV. RESULTS

Once data was obtained, questionnaires were analyzed in Excel software, under the recommendations of Hinojosa (2008) for the statistical analysis in NSN, there were calculated the following indicators criteria:

- J Value: is the total of stimulus words generated on the NSN
- M Value: is the product of the frequency of a node by its semantic value.
- G Value: is the result of the differences between highest M values, divided into the sum numbers realized and explains the dispersion of knowledge inside population.
- SAM group: is the group with the heaviest semantic weight, generally the first ten words.
- FMG Value: is the punctuation expressed by the SAM group proportion. (Arévalo,2011)

At the second stage of the analysis, the semantic weight of each word was measured (M value) in each group of participants (FQ and SQ). Results are shown at table 5.

Table 5. SAM groups of FQ and SQ.

FQ group				SQ group			
Stimulus word	M value	FMG value	G value	Stimulus word	M value	FMG value	G value
<i>Learning</i>	71	100	0	<i>Learning</i>	40	100	13
<i>Knowledge</i>	71	100	0	<i>Thinking</i>	33	82.5	7
<i>Attention</i>	63	88.73	8	<i>School</i>	30	75	3
<i>Work</i>	54	76.05	9	<i>Write</i>	22	55	8
<i>Respect</i>	40	56.33	14	<i>Homework</i>	17	42.5	5
<i>School</i>	38	53.52	2	<i>Research</i>	16	40	1
<i>Life</i>	30	42.25	8	<i>Class notes</i>	15	37.5	1
<i>Improve</i>	30	38.02	0	<i>Profession</i>	14	35	1
<i>Read</i>	30	28.16	0	<i>Exercises</i>	14	35	0
<i>Memorize</i>	27	28.16	3	<i>Life</i>	13	32.5	1
J value = 530 words				J value= 240 words			

After analyzing the information of table 5, it can be concluded that is exist similarities between the FQ and SQ social representations about learn, the words: learning, school and life were shared between both groups, which suggest that in both groups learn might be related with a process or action of learn, then the same happened with the word school, that can be considered as a place where knowledge can be built, and the last category was for life (FQ and SQ M value = 71,40; 38,30; 30,13), which suggest that the students considered the process of learning as an essential part of their life and environment.

It is important to mentioned that the M value for the word learning was different, 71 and 40 for the FQ and SQ respectively, but the number of participants and the size of the semantic network (J value) were different, which could be probably a main reason to consider on the analysis.

In a qualitative analysis, inside the SAM groups are meanings related with human values such as respect (40) and profession (14), then, this mental construction might be influenced by human actions involved in the process of education.

FMG values, were different in each group, on the FQ, the longest semantic distance was for work (FMG value =14) and respect, with this it can be inferred that the level of importance the students have about these meanings is more pronounced. In SQ group the longest was for learning and thinking (13). It can be noticed that the M values in each group were repeated in some of the categories, which suggest that the dispersion of meanings are very closed to each one.

V. DISCUSSION AND CONCLUSION

After the analysis of the data obtained on the results, and based on the general purpose of the research, can be concluded that the aim was reached according to the research question. Though the initial hypotheses were partially covered. because it was stablished at the beginning that the students had a social representation in

common about the meaning of learning with a mental construction of books and teacher. The words teacher and books appeared on the SAM group of both teams, but the semantic value were low.

In the same idea of the study of Piña (2004), education is still representing by the category of learning, in a more philosophical way of explaining the process of learning and teaching are together as it might be considering as one epistemological identity (Torres,2014). In the case of this study, students categorized their social representations in common, like the mental construction of learn, school and life.

One of the challenges of this study was the size of the population in both groups, it is recommended that in future researches about this topic, a probabilistic sample may be considering, in other way, it is important to expose that it was required an expert opinion of teachers, so in this pathway, the objective and behavior of data could be explained in a more integral analysis. A correlational statistical test is suggesting for improving the significance of this investigation.

Finally, it can be concluded in this comparative study, that students share social representations about learning, in three different categories: learn as a process, school and life, but still the necessity of more qualitative and quantitative studies is required with the purpose of improve the performance of the actions involved the education phenomenon.

REFERENCES

- [1]. Alluin, F. (2007). L'image des sciences physiques et chimiques au lycée (LEGT et LP). Ministère éducation nationale enseignements supérieurs recherche. Retrieved from: <http://media.education.gouv.fr/file/83/5/4835.pdf>
- [2]. Almaguer, C, & Piñones, L (2001). Les représentations d'élèves d'élémentaire et secondaire, a propos de l'égalité d'éducation entre enfants pauvres et riches, (Mémoire de Licence inédit, Université Nationale Autonome de Mexique).
- [3]. Álvarez-Gayou, J (2003). Como hacer investigación cualitativa: fundamentos y metodología.
- [4]. Cavallo, P. Iannacone, A. (1993). Représentations Sociales et construction des connaissances. Textes sur les représentations sociales. 2(3). Retrieved from : http://psych1.lse.ac.uk/psr/PSR1993/2_1993Boggi.pdf
- [5]. Comejo, A (1995), Étudiants de Secondaire de CCH: représentations et perspectives de la vie d'étudiant et institutionnelle à la 3eme Conférence de Recherche Educative Mexicaine. Mexique, Université pédagogique nationale, pp. 70-99.
- [6]. Figueroa, N. J. González, E. y Solís, V (1981) Una aproximación al problema del significado: Las Redes Semánticas. *Revista Latinoamericana de Psicología*, (13) 3, 447 -458.
- [7]. Figueroa, N. J. González, E. y Solís, V (1981) Una aproximación al problema del significado: Las Redes Semánticas. *Revista Latinoamericana de Psicología*, (13) 3, 447 -458.
- [8]. García, B y Jiménez, S (1996). Redes semánticas de los conceptos de presión y flotación en estudiantes de bachillerato. *Revista Mexicana de Investigación Educativa*, 1(2). Retrieved from: <http://www.redalyc.org/pdf/140/14000205.pdf>
- [9]. Giordan, A (1994). Les aspects qualitatifs de l'enseignement des sciences dans les pays francophones. UNESCO: Institut international de planification de l'éducation. Retrieved from: http://www.unesco.org/education/pdf/325_95.pdf
- [10]. González, S. Valdez, J. González-Arratia, N. Velasco, D.(2012) Cómo afrontar los adolescentes mexicanos el malestar depresivo. *Psicumex*, 2(1), 19-30. Retrieved from: http://www.psicumex.uson.mx/revistas/articulos/3-R3_ARTICULO_02.pdf
- [11]. Hinojosa, G (2008). "El tratamiento estadístico de las redes semánticas naturales". *Revista internacional de Ciencias Sociales* (México). XVIII(1), 133-154. Retrieved from: <http://www.redalyc.org/pdf/654/65411190007.pdf>
- [12]. Lilian Negura, L'analyse de contenu dans l'étude des représentations sociales, *SociologieS* [En ligne], Théories et recherches, retrieved from: URL : <http://sociologies.revues.org/993>
- [13]. Limón, F (2011). Représentations sociales de l'éducation scolaire entre les <Chuj> mexicains. *Revista Pueblos y Fronteras Digital*, vol. 6, núm. 12, December-may, 2011, pp. 133-166
- [14]. López, F. (1999), Le professeur : son éducation et image populaire. (Mémoire de Doctorat, inédit, Université Nationale Autonome de Mexique)
- [15]. Macotela, S. Flores, C. Seda, I. (2001). Les croyances des professeurs mexicains sur le rôle d'école et enseignant. *Revista Iberoamericana de Educación*, pp. 70-99.
- [16]. Ministère de l'éducation du Québec (2001). La formation à l'enseignement: les orientations, les compétences professionnelles. Retrieved from: http://www.education.gouv.qc.ca/fileadmin/site_web/documents/reseau/formation_titularisation/formation_enseignement_orientations_EN.pdf
- [17]. Piña Osorio, Juan Manuel. (2013). Las representaciones sociales y la reforma educativa. *Perfiles educativos*, 35(140), 3-6. Retrieved from: http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S0185-26982013000200001&lng=es&tlng=es.
- [18]. Piña, J. Cuevas, Y. (2004). La théorie de les représentations sociales. Son utilisation dans la recherche éducative au Mexique. *Profils Educatifs*. 106 (troisième époque). Retrieved from: <http://www.redalyc.org/pdf/132/13210605.pdf>
- [19]. Piña, Juan Manuel (coord.) (2003), *Representaciones, imaginarios e identidad. Actores de la educación superior*, México, CESUUNAM/ Plaza y Valdés.
- [20]. Torres Delgado, J. M., & Aguayo Rousell, H. B. (2014). *Representaciones sociales de estudiantes lasallistas sobre filosofía*. (Mémoires de Doctorat inédit, UNAM)
- [21]. UNESCO (2006). Modelos innovadores en la formación inicial docente. Retrieved from: <http://unesdoc.unesco.org/images/0014/001465/146544s.pdf>
- [22]. Vera-Noriega, J. Pimentel, C. Batista de Albuquerque, F (2005). Redes Semánticas: aspectos teóricos, técnicos, metodológicos y analíticos. *Ra Ximhai*, 1(3), 439-451
- [23]. Zermeño, A, Arellano, A. Ramírez, V (2005). Redes semánticas naturales: técnica para representar los significados que los jóvenes tienen sobre televisión, internet y expectativas de vida. *Estudios sobre las culturas Contemporáneas*, XI(2), 305-334. Retrieved from: http://bvirtual.ucol.mx/descargables/669_redes_semanticas_naturales.pdf