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Application of mind maps as a learning resource for university students

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Abstract

The research aims to know the effectiveness of the application of mind maps as a didactic resource in the learning of university students. The study was applicative, with a quasi-experimental design, we worked with a sample of 78 students from a university in Lima, Peru. As a result, it can be shown that both the control and experimental groups do not present significant differences in the pretest. In conclusion, teaching is not only about providing information, but also about helping to learn, and to do so the teacher must have a good knowledge of his/her students.

Keywords: Learning, Mind maps, Didactics, University.

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Aplicación de mapas mentales como recurso de aprendizaje para estudiantes universitarios

Resumen

La investigación tiene como objetivo conocer la efectividad de la aplicación de los mapas mentales como un recurso didáctico en el aprendizaje de los estudiantes universitarios. El estudio fue aplicativo, con un diseño cuasiexperimental, trabajamos con una muestra de 78 estudiantes de una universidad en Lima, Perú. Como resultado, se puede demostrar que tanto el control como los grupos experimentales no presentan diferencias significativas en la prueba preliminar. En conclusión, la enseñanza no se trata solo de proporcionar información, sino también de ayudar a aprender, y para hacerlo, el maestro debe tener un buen conocimiento de sus alumnos.

Palabras clave: Aprendizaje, Mapas mentales, Didáctica, Universidad.

1. INTRODUCTION

Learning is one of the most important mental functions in the human being, it is the process by which skills, knowledge, behaviors are acquired or modified as a result of the study, experience, instruction, reasoning, and observation (FELDMAN, 2005). For SCHUNK, (1991) learning consists of acquiring, processing, understanding and, finally, applying information that has been taught to us, that is when we learn we adapt to the demands that the contexts demand of us, which implies acquisition and modification of knowledge (IBAÑEZ, 2006).

The learning process is an activity that takes place in a social and cultural context and is the result of individual cognitive processes through which new information (facts, concepts, procedures, values) is

assimilated and internalized, new significant and functional mental representations (knowledge) are constructed, which can then be applied in situations different from the contexts where they were learned. Learning is not only about memorizing information, but it also requires other cognitive operations that involve: knowing, understanding, applying, analyzing, synthesizing and valuing (MOGOLLÓN, 2013). All new learning is by definition dynamic, so it can be reviewed and readjusted (RODRÍGUEZ, 2014). That is why it is said that it is an unfinished and spiraling process. In synthesis, it can be said that learning is the progressive qualification of the structures with which a human being understands his reality and acts in front of it (he starts from reality and returns to it).

One of the basic challenges of education today is to prepare people to be able to participate in a society plagued by information in which knowledge is a critical source of social and economic development (GALLARDO & LAU, 2016). Therefore, today's education requires the transformation of the mechanisms of knowledge transmission. The new trends in education seek greater student participation in the educational process, as well as meaningful and collaborative learning, making the use of different learning tools become indispensable didactic means and where the teacher has a more flexible vision of learning and the means to effectively achieve this process in students.

The organization of the teaching-learning process in universities should not respond to teaching characterized by productive strategies,

which enhance the possibilities of students and make optimal use of the wealth offered by the culture of humanity; it prepares them to face their educational reality, interpret it and transform it in terms of development; however, in some universities, there is still evidence in the pedagogical practice of the predominance of a conception of banking education, centered in the teacher as the basic and omnipotent axis of an eminently instructive process, guardian transmitter of a supposedly finished, unquestionable and imperishable knowledge (MENDOZA & HUARACHI, 2008).

Today, social science and humanities courses have a relevant role to play in the context of the knowledge society, not only because they are in themselves sources of academically relevant and socially significant knowledge, but also because of their contribution to defining and orienting strategies for change in public policy, in citizen participation, in informed public opinion and the democratization of the political system and society. The responsibility of social scientists and humanists in the scenario of the knowledge society is therefore not limited to the performance of a function of production and dissemination of specialized knowledge, but also involves ethical and political commitments to the main values of public interest. Social science students regularly need opportunities to investigate issues in depth. Covering all social science material inevitably results in superficial and uncommitted teaching.

In this sense, we consider that the proposal of the conceptual mindsets, created by the Conceptual Pedagogy, guarantees the

development of reflection, besides allowing a productive involvement in the learning process, it constitutes a tool that can be used by students in their pre-professional practices while guaranteeing the development of thought and greater quality in learning (IBAÑEZ, 2006).

Mind maps function as a cognitive hierarchical diagram that organizes and preserves knowledge, in which fundamental ideas are captured and secondary ideas are discarded. With this tool, it is possible to examine and interpret concepts representing them graphically and increasing their understanding. In the classroom, the mentifacts favor the bidirectional communication that exists between the protagonists and induces in the student a reflection and the analytical start of reality, becoming a powerful pedagogical tool that allows the student a better understanding of the object of study.

The use of mind maps in learning is constructive, cooperative and motivating. Given these characteristics, mind maps are important tools for their use, which consists of a computer, designed for image processing, and one and a series of terminals for students to interact with the system. The above mentioned allows us to ask ourselves which is the effectiveness of the application of Mind Maps as a didactic resource in the CCSS Learning of university students?

2. METHODOLOGY

This article, due to its characteristics, is located within the research applied to education because it sought to determine the

influence of the application of mind maps in learning. The design used was experimental, in which, the study subjects were assigned to the control and experimental groups respectively, and were then simultaneously administered a pre-test. One group will receive the experimental treatment and another one will not (control group), finally, they were also given simultaneously a post-test.

The universe of our study was made up of 405 students enrolled in the Faculty of Tourism, Hotel Management and Administration at a university in Lima, Peru. The sampling was probabilistic, simple random, where counting with the sample frame (lists of enrolled students), the function of random numbers was made through Excel, getting the total sample of 78 students, which were then also assigned at random to the respective control and experimental groups.

The Questionnaire for Learning in CCSS designed by the researchers was used, divided into 05 dimensions 1) Acquisition and integration of knowledge; 2) Meaningful use of knowledge; 3) Attitude and perception; 4) Mental habits and 5) Extension and deepening of knowledge.

Reliability was determined through the KR - 20, obtaining in the internal consistency test value of 0.928. The concurrent validity and the predictive validity were determined through the Spearman-Brown correlation test or Split-Half Method, obtaining a value of 0.923, that is, a high correlation between its items, representing high criterion validity.

3. RESULTS AND DISCUSSION

When evaluating the attitudes and perceptions dimension, it is evident that there are no significant differences between the control and experimental groups in either the pretest or the post-test. For the second dimension of knowledge acquisition and integration, it is evident that there are no significant differences in both groups (control and experimental) in the pretest, which confirms the random distribution in both groups since they do not present differences before the intervention. However, in the post-test, if statistically significant differences between both groups are evidenced, which shows the effectiveness of the intervention ($p<0.05$). In the third dimension, extension and deepening of knowledge, it is evident that there are no differences between the control group and the experimental group in the pretest; however, in the post-test, if there are any, in this dimension the bad level is presented in the control group with 28.2%, in the experimental group it is obtained 0%. Similarly, the good level is 0% in the control group and 61.5% in the experimental group. For the fourth dimension significant use of knowledge, in the post there are significant differences between both groups, presenting a good level in the control group of 25.6% and in the experimental group it amounted to 51.3%. Finally, in the fifth dimension mental habits, in the post-test there are statistically significant differences, the control group showed a level of the good of 0% in contrast with the experimental group that obtained 17.9% (see table 1 and 2).

Table 1: Pretest and Posttest comparison of dimensions in relation to the learning of the CCSS

			PRETEST		POST TEST	
			Frequency	%	Frequency	%
Attitudes and Perceptions	Control	Bad	13	33.3	17	43.6
		Good	26	66.7	22	56.4
	Experimental	Bad	15	38.5	11	11
		Good	24	61.5	28	28
Knowledge acquisition and integration	Control	Bad	3	7.7	7	17.9
		Regular	22	56.4	21	53.8
		Good	14	35.9	11	28.2
	Experimental	Bad	4	10.3	4	10.3
		Regular	12	30.8	8	20.5
		Good	23	59	27	69.2
Extension and deepening of knowledge	Control	Bad	8	20.5	11	28.2
		Regular	21	53.8	28	71.8
		Good	10	25.6	0	0
	Experimental	Bad	4	10.3	0	0
		Regular	31	79.5	15	38.5
		Good	4	10.3	24	61.5
Significant acquisition of knowledge	Control	Regular	25	64.1	29	74.4
		Good	14	35.9	10	25.6
	Experimental	Bad	4	10.3	0	0
		Regular	27	69.2	19	48.7
Mental habits in learning	Control	Bad	15	38.5	18	46.2
		Regular	24	61.5	21	53.8
		Good	0	0	0	0
	Experimental	Bad	8	20.5	4	10.3
		Regular	24	61.5	28	71.8
		Good	7	17.9	7	17.9

Table 2: Statistically contrast to comparative the dimension in relations whit a Knowledge the CCSS

		PRE TEST	POST TEST
Attitudes and Perceptions	U de MannWhitney	721.5	643.5
	W de Wilcoxon	1501.5	1423.5
	Z	-0.469	-1.407
	Sig. Asintót. (bilateral)	0.639	0.159
Knowledge acquisition and integration	U de MannWhitney	611,000	462,500
	W de Wilcoxon	1,391,000	1,242,500
	Z	-1.660	-3.268
	Sig. Asintót. (bilateral)	.097	.001
Extension and deepening of knowledge	U de MannWhitney	725,500	210,000
	W de Wilcoxon	1,505,500	990,000
	Z	-420	-6,148
	Sig. Asintót. (bilateral)	.675	.000
Significant acquisition of knowledge	U de MannWhitney	593.500	565.500
	W de Wilcoxon	1,373,500	1,345,500
	Z	-2.022	-2.312
	Sig. Asintót. (bilateral)	.053	.021
Mental habits in learning	U de MannWhitney	540,000	414,000
	W de Wilcoxon	1,320,000	1,194,000
	Z	-2.560	-4.055
	Sig. Asintót. (bilateral)	.051	.000

When the global analysis of the learning of the CCSS is carried out, it can be seen that both the control and experimental groups do not present significant differences in the pre-test; however, in the post-test, they do ($p<0.05$). It can be seen that a good level is obtained in the control group of 12.8% compared to 69.2% in the experimental group (see table 3 and 4).

Table 3: Pre- and post-test comparison in the learning of SSC

		PRE TEST		POST TEST	
GRUPO		Frecuencia	Percentage	Frecuencia	Percentage
CONTROL	Bad	0	.0	4	10.3
	Regular	27	69.2	30	76.9
	Good	12	30.8	5	12.8
	Total	39	100.0	39	100.0
EXPERIMENTAL	Regular	28	71.8	12	30.8
	Good	11	28.2	27	69.2
	Total	39	100.0	39	100.0

Table 4: Contrast statistics to compare the control and experimental groups during the pre-test and post-test in the learning of the CCSS

Contrast statistics[a]

	PRETEST	POSTTEST
U de Mann-Whitney	741,000	307,500
W de Wilcoxon	1521,000	1087,500
Z	-,247	-5,143
Sig. asintót. (bilateral)	,805	,000

a. Grouping variable: GROUP

4. CONCLUSIONS

According to Dezubiria mind maps strengthen the cognitive aspect, besides for FELDMAN (2005), there is a way to deepen the knowledge that is by comparing concepts and this is given by the mind map that does it through its elements as the isoordinate, supraordinate, excluded, infraordinate (PARRACHACÓN & LAGODEVERGARA, 2003).

What is impressive about MindFact maps is that they allow a greater critical analysis both to teachers and to students, as students work with others, generating an intellectual product; this product, in which all may have contributed. This minimizes the kind of harmful competition that occurs in many classrooms and maximizes the positive effect of social learning, based on the principles of constructing, reflecting, criticizing, producing, arguing, and projecting knowledge in a meaningful way. Given that there is a significant difference in the post-test with respect to the acquisition of concepts, Mind Maps should be considered as a didactic resource for all subjects of the Professional School curriculum, as well as homogenizing the evaluation criteria so that they are not only focused on the cognitive part but also measure the part of the process and construction of information.

Teaching is not only about providing information, but also about helping to learn, and to do so the teacher must have a good knowledge of his or her students: what their previous knowledge is,

what they are capable of learning at a given time, their learning style, the intrinsic and extrinsic reasons that encourage or discourage them, their work habits, the attitudes and values that they manifest in relation to the specific study of each subject, etc. (CANO, 2008).

REFERENCES

CANO, E. 2008. "La evaluación por competencias en la educación superior". **Profesorado, Revista de curriculum y formación de profesorado.** Vol. 12, N^{o} 3: 1-16. Spain.

FELDMAN, R. 2005. **Psicología: con aplicaciones en países de habla hispana (6ta Edición).** México: McGraw-Hill. Mexico.

GALLARDO, I., & LAU, J. 2016. "La alfabetización informacional en docentes de educación básica". **Número especial. Educación mediada por Tecnología: alternativas digitales y virtuales**. Vol. 1: 190-211. Colombia.

IBAÑEZ, M. 2006. "Mentefactos conceptuales como estrategia didáctico pedagógica de los conceptos básicos de la teoría de muestreo aplicados en investigación en salud". **Revista Ciencias de la Salud.** Vol. 4: 62-72. Colombia.

MENDOZA, L., & HUARACHI, G. 2008. "Los Mentefactos Conceptuales como Estrategia Metacognitiva en el Logro de los Aprendizajes Significativos de los Alumnos en la Asignatura de Corrientes Pedagógicas Contemporáneas". **Ciencia & Desarrollo**. Vol. 12: 17-22. Perú.

MOGOLLÓN, C. 2013. "Mapas conceptuales y mentefactos: comparación y propuesta para favorecer aprendizajes significativos formativos". **Educación y futuro: revista de investigación aplicada y experiencias educativas**. Vol. 29: 181-204. Spain.

PARRACHACÓN, E., & LAGODEVERGARA, D. 2003. "Didáctica para el desarrollo del pensamiento crítico en estudiantes universitarios". **Educación médica superior**. Vol. 17, N^{o} 2. Cuba.

RODRÍGUEZ, D. 2014. "Los mentefactos como herramienta eficaz para el desarrollo de la lectura crítica". **Revista Horizontes Literario.** Colombia.

SCHUNK, D. 1991. **Learning theories. An educational perspective.** New York: McMillan. USA.

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