Entre

CIENCIA e INGENIERIA 3

Armando Dias Duarte
(Organizador)

Atena Editora
Ano 2022

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Telefone: +55 (42) 3323-5493
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APRESENTAÇÃO

A coleção de trabalhos intitulada "*Entre Ciencia e Ingenieria 3*" é uma obra que tem como foco principal a discussão científica por intermédio de diversos trabalhos que compõe seus capítulos. O volume abordará de forma categorizada e interdisciplinar, pesquisas cujos resultados possam auxiliar na tomada de decisão, tanto no campo acadêmico, quanto no profissional.

Nos capítulos apresentados, são encontrados estudos de grande valia nas áreas da simulação computacional, materias, gestão energética, aspectos industriais, estudos ambientais, na área da educação e otimização.

A composição dos temas buscou a proposta de fundamentar o conhecimento de acadêmicos (as), mestres (as) e todos (as) aqueles (as) que de alguma forma se interessam pela área da Engenharia, através de temáticas atuais com resoluções inovadoras, descritas nos capítulos da coleção. Sendo assim, a divulgação científica é apresentada com grande importância para o desenvolvimento de toda uma nação, portanto, fica evidenciada a responsabilidade de transmissão dos saberes através de plataformas consolidadas e confiáveis, como a Atena Editora, capaz de oferecer uma maior segurança para os novos pesquisadores e os que já atuam nas diferentes áreas de pesquisa, exporem e divulgarem seus resultados.

Armando Dias Duarte

SUMÁRIO

CAPÍTULO 13

OBSERVATION IN THE HIGHER-LEVEL CLASSROOMS OF THE IPN

Data de aceite: 04/07/2022

Patricia Acevedo Nava
Instituto Politécnico Nacional IPN
Escuela de Comercio y Administración ESCA Tepepan

ABSTRACT: The purpose of this work is to elaborate on the observation technique that allows easy identification of this tool as a support in the collection of data, which requires the construction of a social situation to identify the phenomenon in its normal functioning; it is a qualitative research tool. This work is carried out in four IPN groups on subjects from different areas and is part of the research carried out under project No. 20 130 355 "*Pupils of students in higher education and the application of the institutional educational model*". The results of the recordings made in two schools are presented as part of the progress made. The results are real support for the design of strategies in the classroom.
KEYWORDS: Observation, classroom, students, qualitative research.

INTRODUCTION

Within research, which begins most of the search for knowledge by asking ourselves, "*Why do things happen?*" As we know, everything starts with the observation of the environment and the events that arise in it, but now we will focus on this, as an instrument of the qualitative method, this is done in order to have a broader and more comprehensive knowledge of how it is used.

This work is the result of the documentary research that was carried out in order to observe students during their classes in different schools of the Polytechnic Institute as part of the multidisciplinary project SIP 20 130 355: "*Pupils at the Higher Level and the Application of the Institutional Educational Model*. " Below are some definitions of what is meant by observation used as a research tool.

To begin with the development of this paper, we will mention some definitions that will be necessary to understand the various meanings, for Marshall and Rossman define observation as "*the systematic description of events, behaviors, and artifacts in the social setting chosen to be studied*" (Marshall and Rossman 1989 p. 79)."*Observations empower the observer to describe existing situations using the five senses, providing a* "written photograph" of the situation under study" (Erlandson, Harris, Skipper & Allen 1993 p. 83).

Demunck and Sobo (1998) describe observation as

> "*The first method used by anthropologists when doing fieldwork. Field work involves active gaze, improved memory, informal interviews, writing detailed field notes, and, perhaps most importantly, patience*" (Dewalt & Dewalt 2002, p. 156).

BACKGROUND

Observation is considered a major article in anthropological studies, especially ethnographic studies, and has been used as a method of data collection for over a century. As reported by Dewalt and Dewalt (2002), one of the earliest cases of its use involved the work of Frank Hamilton Cushing, who spent four and a half years as a participatory observer with the Zuni people around 1879 in a study for the Ethnology Bureau of the Smithsonian Institute. During this time, Cushing learned the language, participated in the customs, was adopted by a member of the tribe, and was initiated into the priesthood. Since he did not publish much about this culture, he was criticized for having become a native, meaning that he had lost his objectivity and, therefore, his ability to write analytically about the culture.

> Characteristics of the Observation
>
> From what has been described in articles and books, observation has three fundamental characteristics which are:
>
> Observation takes place in the natural environment.
>
> The observer must stay away from the place where the events occur in order not to alter the observed phenomenon.
>
> Use descriptive techniques (Pereda 1987 p. 28)

SHOWS

The subject is approached from the phenomenological method through qualitative analysis, and using observation as instruments, the observations that were taken into account to carry out this research are those of the Higher School of Medicine (ESM), the Higher School of Chemical Engineering and Extractive Industries (ESIQUE) of the National Polytechnic Institute (IPN) in the semester January – June 2014 with a focused sample of 2 groups, it is specified that all classes are recorded per 2-month-old sow:

ESM 21 students

ESIQIE 17 students

DESCRIPTION OF THE TECHNIQUE

In conducting this research, one of the instruments used was the recording of classes at the IPN School of Medicine, the IPN School of Chemical Engineering and Extractive Industries, which helps us to identify what students are perceiving in the classroom with the greatest efficiency, validity and effectiveness.

While using the recording of classes as an instrument, we say that our technique by this means has been observation. The observation according to Angle Fernandez:

> "*Is a technique that allows obtaining information through the recording of the characteristics or behaviors of a group of individuals or elements without*

> *establishing a communication process and therefore without the need for collaboration on the part of the group analyzed"* (Fernández, 2004, p. 84).

Given the definition offered by Angle Fernández, we can say that this technique allows us to capture information about some phenomenon, patterns, behaviors, practices, etc., in order to obtain a certain testimony necessary to carry out the final objective of the research.

However, in order for the consideration to be considered as scientific it must meet the following requirements as indicated by Yuni J. (2006, p. 40):

1. That it is guided by some scientific theory.
2. To serve an already formulated research problem.
3. That it be planned and carried out in a systematic way.
4. Related to broader scientific propositions.
5. To employ objective instruments, i. e. to observe, record and interpret the facts in such a way that other investigations can identify their findings.
6. It is subject to some control to verify its validity and reliability.

Adapting this author's point, we find that the research is oriented to a phenomenological theory, with the sub-category of "*perception*", which is where we situate and direct this study. In the second point, investigating the theme "*what do students perceive of what happens in the classroom*?" leads to the resolution of a problem, inferring whether it is still prudent to carry out the study. The same teaching method that is currently being used, in which we can see that the study was planned this study.

This observation technique serves us to study the behaviors of what we want to analyze in a regular and natural way, in our case to determine the factors that influence the perception of the students, it also serves us to observe the behavior of the participants that might not be present in the interaction, by means of recordings, as is the case we are working on.

Considering that observation is the action of observing and looking in detail, the aim is to capture more accurately the factors that determine the student's perception in the classroom, Felipe Pardinas treats the technique of observation from two senses:

> "*The action of the researcher, which may also be called the researcher's experience, the procedure of looking closely, that is, in a broad sense, the experiment, the process of subjecting the conduct of certain things to conditions manipulated according to certain principles for carrying out observation; but observation also means the set of observed things, the set of data and the set of phenomena. In this sense, what we could call objective, observation is equivalent to data, to phenomena, to facts*" (Pardinas, 2005, p. 89).

Given the above quotation we can infer that what we are observing to carry out our study are behaviors of the students. By behavior we understand a series of actions or acts

that are noticeably seen or observed in a given entity or groups of entities, then these actions or acts occur following a result or effect that appears repeated with the same characteristics, peculiarities and properties as in other entities of the same class. If we look at the behaviour of the students, it is easier to determine what they perceive in the classroom.

Based on this research technique, as an observation, classes were recorded in which, as mentioned by the author Pardinas,(2005) the behavior of students was analyzed in detail, detecting the behavioral patterns that influence the perception of the student, subjecting these behaviors to a thorough study to finally collect the data, and the evidence needed to prove the final argument and reach the goal initially set. taking the recordings and evidence as representative data in this research.

Finally, it was decided to use this research technique, as it is part of a process that helps us to gather information consisting of inspecting and studying things or facts as they occur in reality, such as the recording of the classes of the above-mentioned schools and the use of the senses, which start with the aid of technology or without the aid of it, according to the demands of the study. (This study needed the help of technologies).

Analysis and interpretation of observations.

At the time of the present research, four behavioral patterns that influence the perception of the student in the classroom were detected in two of the schools, ESM and ESIQUE. These are: class participation, the student's attitude, teaching technique and the distribution of the student in the classroom. What each of these consists of will be specified in detail below.

Behavioral patterns detected at the Higher School of Medicine (ESM) and the Higher School of Chemical Engineering and Extractive Industries (ESIQUE) of the National Polytechnic Institute (IPN):

1. Participation in class.

These are usually a very important activity for the teacher, as well as benefiting the student when it comes to expressing their question or opinion seriously. As well as serious students, there are also others who, in their participatory act, tend to take things in line with comments out of context. From the beginning, trust must be built so that the student can speak freely, since many are shy and, for fear of being mocked, do not participate. What happens is that they don't, *"the lack of experience in participatory processes makes some attempts to achieve it a failure*" (Guerra, 2003, p. 119), and the fear of failing or feeling observed by everyone would not end. And not all, out of fear or shame, fail to participate, but among those students are those who lack interest and prefer to remain silent or distract others.

Through participation, cooperation and dynamics are developed in the group, attitudes are observed and reasoning is perceived. Teachers are responsible for the flow of motivation, having a moment where students can come up with their ideas and promote it with everyone. Provided that the discussion and exchanges are optimal, which is what

the school seeks to teach for different forms of coexistence; "*student participation has been considered a formative experience in itself, one that acquires full significance in the future*" (Cerda, 2004, p. 84). This is the training that is being promoted from the beginning. It is encouraging with positive attitudes to achieve communication and developing more techniques in which the teacher can explain every time something is not understood.

2. Attitude of pupils.

The attitudes of the student within the class, comes depending on several factors. A favorable and successful performance for the student, part of their motivation. The perception that the teacher has in class, determines his result, that is, when he finds the positive atmosphere in the teacher, where he knows that he is allowed to participate and is given time to express his opinion or conclude doubts, he achieves a better performance. But in addition, "*within the complex psychic world of people, the self-concept becomes important as the basis of many of our attitudes*" (Sallán, 1990, p. 59), so having one's own concept helps to build the structure, both social and personal, so that feeling incapable of accomplishing a task will be the result of a failure, and being so, one finds it difficult to carry out a steady pace in the classroom; positive evaluations help them to enhance their abilities, develop skills and, at the same time, increase their self-confidence. Everything is encouraged by the disposition that exists in each one, since starting the activity in class, and feeling part of it, manages to increase the motivation and enthusiasm to follow and pay attention. Where they sit is another important factor." *Those who have a more positive attitude towards learning would sit closer to the teacher, in the front rows (. . .), those less interested in the class would sit in the back rows"* (Francesch, 2007, p. 62). Those who are not interested in the subject taught by the teacher, usually go far away from him in order to be comfortable when it comes to distraction in other things and not be easily discovered. The teacher-student relationship has varied and conflicts have arisen when the teacher draws the attention of one or more of his students, and some of the students tend to be disrespectful and aggressive in responding to him, creating a hostile environment that is further detrimental to the interest of attending the class.

3. Teaching techniques: use of technologies and body language.

Another behavioral pattern to be considered that influences the perception of students is the teaching techniques of the teacher, although this factor does not individualize the student, it does have an impact on their learning and the way they perceive their environment, and therefore the class.

Non-verbal communication generates perception and for this it is necessary that there are methods using the means of communication of body language, then it is no longer just talking or writing, but a gesture that captures the attention and will influence the perception of the student. Any expression will help to better understand a topic in class when the teacher exposes. As a teaching technique it is necessary to know how to use body language correctly, so that in certain situations and explanations are emphasized, such

as the use of hands, captures attention and shows the student more interested in what is happening in front of him. It is important to take care of this language, since it is a means of impact for many of those who visualize it. (Hervás, G. 1998, p. 78) It indicates us that "*the body is a linguistic structure; it reveals infinity of information, although the subject keeps silent*", and it is so, a teacher can remain silent to denote that he has been annoyed by the lack of attention of the students towards him when he was speaking.

4. Student distribution.

The reality is that classroom space can condition learning processes. It can be very routine as a result, but space modifications can positively change students' performances and behavior. If this change is achieved with their participation, the modifications will be positive. At the time of class work, with the contribution of new proposals, as well as the increase in the number of questions or requests made to the teacher and the way of conducting the class at the beginning and the difference at the end, the change can be observed.

Those who present themselves with an optimistic and enthusiastic attitude towards learning would sit close to the teacher, where they can pay as much attention as possible and not miss anything, while those who are less interested in the class would sit in the back rows. Blazquez points out: "*the interrelation existing between the place students occupy in class and their school performance*" (1993, p. 95). Greater participation is observed among students in the center and in the front rows. It is no longer only that they do not find a place close to the teacher, but there are already those who seek to sit away from him, which shows disinterest. It is not important for a student who usually attends classes to sit in the back of the classroom; but it is not convenient for a boy who tends to be distracted to do so. It is possible to observe directly the consequences and utilities that can exist depending on the organization that exists within the classroom. Gómez A. concludes that "*if it is desired to facilitate the interrelation among the students, the desks have to be placed in a circle. If you want to promote oral responses, you will adopt the ''circle'' or group organization. If you want to prevent students from being distracted or showing disruptive behavior, in no case should they be placed in rows*".

Unidirectional and opposing structures between student and teacher tend to favor individual, competitive, homogeneous activities. On the other hand, a bidirectional structure that integrates formal and informal elements favors student optionality, cooperative work and group work. In groups, exchanges can be more beneficial between the various units created, while in circles, the bidirectional relationship is established between all the elements of the group.

It is understood that a classroom must provide the appropriate learning environment for the students who use it and many factors are important for the learner to have a good focus. For example, the easy location of the learning resources, such as the blackboard or even the maps on the wall. Other environmental aspects such as lighting and temperature,

which is what moves the learner and makes them more comfortable to study. The exact requirements, however, can vary greatly according to the country, economic resources and the modality or type of education provided.

The existence of a zone of action or classroom area where most of the teacher-student interactions take place is advocated.

In conclusion, it is found that high-performing students tend to be placed more in front of the teacher, and that the location of the students influences the perception of the teacher, even if they have been randomly placed. Although the latter does not happen in most cases. The teacher, as a rule, is the one who arranges the distribution of these and the one who decides which one it is, according to his or her opinion.

COMPARATIVE ANALYSIS OF THE OBSERVATIONS

The following is a comparative table of the behavioral patterns detected that influence the student's perception in the classroom. Two schools are presented, the School of Medicine (ESM) and the School of Chemical Engineering and Extractive Industries (ESIQUE) of the IPN. Also shown are quotations of examples of what happened.

BEHAVIORAL PATTERNS	ESCUELA SUPERIOR DE MEDICINA		ESCUELA SUPERIOR DE INGENIERÍA QUÍMICA E INDUSTRIAS EXTRACTIVAS	
LEVEL OF PARTICIPATION	HIGH PARTICIPATION	"The teacher explains the lesson using incomplete sentences and the students participate by completing the sentences. Most of the students participate actively by answering the teacher's questions." Video: M2U00068	AVERAGE PARTICIPATION	" The teacher continues to explain, asking questions to the students, who respond, although very few are actively participating in the class. " Video: M2U00095
ATTITUDE OF STUDENTS	ENTHUSIAST	"The students laugh and consult with each other briefly about the explanation the teacher gave and found it funny, yet the teacher continues to talk and the students pay attention. As she brings out more topics from the explanation." Video: M2U00069	APATHETHIC	"The teacher says: I am going to make up a fact for you to solve, the students answer: no, no, no, no …" Video: M2U00095

TEACHING TECHNIQUES	USE OF TECHNOLOGIES AND BODY LANGUAGE	"The teacher explains the class with body language as well, pointing out her body parts and indicating medical problems that may exist, while the students follow her and take notes of what she says, actively participating in her questions and incomplete sentences." "Some students follow the teacher by touching parts of her face, which is part of the body language by which the teacher is explaining her lesson." Video: M2U00068 "Through images the teacher explains the formations that a fetus goes through according to the duration of gestation, the images have names, but the teacher asks her students more questions and they actively respond during the class." Video: M2U00069	WORKSHEETS AND EXPLANATION ON THE BLACKBOARD	"The teacher asks the students in front of her to help her hand out some worksheets, and they begin to pass them out. The teacher makes sure that the whole group has the worksheets that she has handed out and asks a student if she has reached the worksheets, she answers that she has them." "The teacher tells the students the topic, then begins to write on the board and explain the lesson." Video: M2U00095
STUDENT DISTRIBUTION	FRONT AND CENTER OF THE CLASSROOM	"The teacher asks her students if they have completed their homework. So they go to their seats, all the seats are taken, concentrating at the front of the room. While the teacher continues to check her laptop with two students, the teacher asks the students if they have completed their homework." Video: M2U00068	BACK OF THE CLASSROOM	"The students are located at the back of the classroom, the seats in front are free." Video: M2U00095

Table 1 Comparative table of the ESM and ESIQUE, of the behavioral patterns detected that influence the student's perception.

ANALYSIS OF RESULTS

1. Level of participation.

School of Medicine (ESM): high participation. School of Engineering and Extractive Industries (ESIQUE): medium participation.

In the ESM the participation of students in class is high, this is most likely due to the

*fact that the teacher most probably gives rise to an influence that motivates the student to participate, or makes him/her feel obliged to do so, it may also be due to aspects related to knowledge and the individual profile of each individual, it is usually productive for the student a high degree of participation, this clarifies doubts, helps to understand and question the knowledge transmitted and in the long term it becomes a teaching - learning process***.**

By having the ability to receive information through the senses, we are talking about a process of perception, although the student, when participating in class, is receiving stimuli to give meaning to the knowledge acquired, organize and structure it, is performing a cognitive process that externalizes it through participation, with a high degree of it, the stimulus received gives rise to an incentive in the functioning of the organs and the brain, awakening the senses and thus influencing the perception of the students**.**

In this school, it should be clarified that the high degree of participation is due to the fact that the class was pertinent for this to happen.

Now, in ESIQUE, the degree of participation was not so notorious; it is worth noting that the teacher attributes this to the lack of participation of the students, and to the lack of interest on their part (although it is not necessarily the teacher's fault). The cause of non-participation may also be due to the fear of lack of knowledge, lack of study, individual disinterest, among others.

The fact that participation in this school was notably lower compared to ESM does not mean that the student's perception process is not taking place, if he/she is paying attention, the information received is processed and therefore carries out a decoding process (although this does not always happen), sometimes participation is not pertinent or the class does not lend itself to this happening.

In ESIQUE, the class was partly mathematical, so it required the student's concentration on his own and a high degree of individuality for his understanding, and although participation helps to empower the participatory student in the development of his learning skills, the fact that this does not happen does not mean that the student is not developing these skills.

In conclusion, there are learning models in which the student is motivated or forced to participate, however, sometimes it is not necessary, the perception process is carried out by participating or not, although on the other hand a high degree of participation awakens the stimuli, giving rise to an external stimulus, obtaining through this stimulus information from the outside that finally reaches our brain becoming a learning experience.

2. Student attitude.

School of Medicine (ESM): enthusiastic.

School of Engineering and Extractive Industries (ESIQUE): apathetic.

In the ESM the attitude of the students was enthusiastic so we can infer that it was positive, that is, they paid careful and permanent attention to the explanations of the subject addressed in class showing interest in their learning, on the other hand, students who have

a more positive attitude feel closer to the teacher. With an enthusiastic attitude we are observing that there is a disposition of mood on the part of the student manifested externally so that his perception and the stimuli he receives from the outside are influenced in a positive way communicating a state of mind towards other people and towards the class more motivating.

If the student is enthusiastic in class, the study is considered interesting and useful, influencing his perception because the data and information processed is decoded in a peculiar way, making it more interesting.

On the other hand, in the ESIQUE the attitude shown by the students was apathetic, with students being distracted in class, acquiring in turn a dependence to elaborate tasks, persisting to act in class. These problems of apathy in class may arise from family problems, problems of integration into social groups, low self-esteem, and so on. However, the perception is formed through experiences, and this is how we decode the information acquired, with an apathetic attitude and once we have analyzed why it is due, we could infer that this is given by a process in the life of each student, or by a lack of interest and indifference to the class, in the latter case, seeing the teacher guilty (to some extent).

3. Teaching techniques.

School of Medicine (ESM): use of technologies and body language.

School of Engineering and Extractive Industries (ESIQUE): worksheets and explanation on the blackboard.

In the ESM the use of technology and body language as a teaching technique predominated, with the use of technological material it is intended that the student creates greater interest in the class, and in turn creating greater communication between students and teacher, favoring personalized teaching, attracting the student's attention and also greater autonomy. In this school the teacher exposed the class, projecting it, passing images that attracted the student's attention making the class more efficient in terms of performance.

It was a medical class that was captured, for the reader to understand this point more, it is explained: the teacher gave a class on diseases in babies and infants, so it was prudent and necessary to employ the use of technologies for students to observe through images the diseases. As the student's perception was influenced, the teacher made facial expressions, and used mimic language and body movements to attract the student's attention and explain herself better. Being the student able to give meaning to the sensations captured from the structuring and organization of the information provided by the teacher, leading to a process of perception in students from another approach, being the visual, which is through this where the neuronal activity begins that later will become experiences and knowledge.

In the ESIQUE it seemed more prudent due to the adaptation of the class, the use of worksheets and explanations on the blackboard.

With the explanation on the blackboard the decoding of the information for the students went through a different process, first, it was required to pay attention to the teacher and follow him so that later with the use of worksheets they could solve the exercises that were entrusted to them, perceiving a given information to later apply the knowledge that was translated into experiences.

4. Student distribution.

School of Medicine (ESM): central and front part of the classroom.

School of Engineering and Extractive Industries (ESIQUE): back of the classroom.

Studies show that the spatial arrangement of students has an impact on their academic performance

In the ESM, the spatial distribution of students was concentrated in the central and front part of the classroom for the teacher, the fact that the students were seated in these places allowed for greater monitoring of their behavior, while in the ESIQUE, the greatest concentration of students was in the back of the classroom. It is perceived differently from front, center or back.

Those who sit in the front or central part of the classroom have greater concentration (not in all cases), but it is true that their distraction is a minority. The space of the classroom coincides in the learning processes, this is due to the fact that there is a direct relationship between the space occupied by the students in the classroom and their school performance. Vázquez d. points out that "*students who occupy the central part of the classroom, their academic performance is higher and the degree of participation is higher, and they are the least distracted*" (2000, p. 76).

This concept determines in an important way how important is the spatial distribution within the classroom.

CONCLUSIONS

This data collection technique is very useful to identify aspects that show factors of students' perception of classroom events.

In studies of this type, it is important to identify attitudes, behaviors and teaching processes, only results are identified, but they are not qualified in terms of good or bad, it is simply pointed out what favors learning and the student's perception, as well as their interest in the subjects taught.

This result supports teachers who want to have an impact with their pedagogical practice in the classroom, in the attitudes of students and in their behavior that manages to support their perception of learning of the knowledge expressed by the same teacher.

It stands out in the comparative that the teaching activities in ESM are attractive and propitiate the learning of the students; calling their attention, concentration in the topics, participation and taking central places and in front, this perception allows identifying how

the students are supported in their learning and this support depends on the activities of the teacher in the classroom.

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REFERENCES

Blázquez, R. (1993). Methods to make learning more effective for your students. Madrid, Spain: Narcea.

Bolaños, G. (2006). Education through movement and corporal expression. Costa Rica: EUNED.

Carrasco, J. B. (2000). Didactics for today: how to teach better. Madrid: RIALP.

Carrasco, J. B. (2004). Strategies to Learning. Madrid: RIALP.

Cerda, A. M. (2004). The complex path of citizenship education: a look at teaching practices.. Santiago: LOM/PIIE.

Demunck E. & Sobo E (1998) “Using Method in the Field” Altamira Press.

Dewalt, K. & Dewalt, R . (2002). “Participant observation: a guide for fieldworkers”. Walnut Creek, CA: Alta Mira Press.

Dewalt, K. & DeWalt, R. (1998). “Participant observation. In H. Russell Bernard (Ed.), Handbook of methods in cultural anthropology” (pp.259-300). Walnut Creek: Alta Mira Press.

Fernandez, A. (2004). Market research and techniques. Madrid: ESIC.

Font, C. M. (2007). Teaching and learning strategies: teacher training and school implementation. Mexico, D.F.: Colofón.

Erlandson, D.; Harris, E; Skipper, B. & Allen, D. (1993). “Doing naturalistic inquiry: A guide to methods”. Newbury Park, CA: Sage.

Francesch, J. D. (2007). The organization of space and time in the educational center. Barcelona: GRAÓ.

Giménez, A. M. (2005). Teaching techniques. Zaragoza: INDE.

Guerra, M. Á. (2003). Aprender a convivir en la escuela. Madrid: Akal.

Hammersley Martyn, P. (1999) “Ethnography. Métodos de investigación”. Editorial Paidós, 2nd edition. USA

Hervás Fernández, G. (1998) “¿Cómo dominar la comunicación verbal y no verbal? Theory and activities. Madrid: Editorial Playor.

Jackson, P. W. (2001). Life in the classroom. Madrid: MORATA.

Marshall, C. & Rossman, G. (1989, 1995). “Designing qualitative research.” Newbury Park, CA: Sage.

Pardinas, F. (2005). Metodología y técnicas de investigación en las ciencias sociales. Mexico City: Siglo XXI editores, S.A de C.V.

Pereda, S. (1987) “Psicología Experimental I, Metodología”, Madrid, Pirámide.

Sallán, J. G. (1990). Las actitudes en educación: un estudio sobre educación matemática. Barcelona: Boixareu Universitaria .

Sanz Pinyol, G. (2005). Effective communication in the classroom: oral expression techniques for teachers.

Yuni, J. (2006). Técnicas para investigar 2. Argentina: Editorial Brujas

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