Neutrosociology for the Analysis of the Pros and Cons of the LIFE Series in UNIANDES, Ecuador

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Abstract. To teach English in Higher Education is of great importance to have professionals prepared for the challenges imposed by the globalization. Ecuador is a Spanish-speaking country for which the teaching of English is part of the programs of study of the courses taught in the Ecuadorian's universities. This paper aims to carry out a statistical study of the acceptance of the LIFE program in the teaching of English at the Regional Autonomous University of Los Andes (UNIANDES in Spanish), its pros and cons. This is measured according to a Likert scale, with five options, two positive, two negative and one neutral. We consider that none of these three levels should pass unnoticed, since each of them shows a tendency to consider. This includes the aspect of indeterminacy, which indicates the existence of contradictions, indifference, among other motivations of this type. Therefore, we perform a non-traditional processing of the Likert scale, more in line with the principles of Neutrosociology and Neutrosophic Statistics, where the indeterminate probability is taken into account for the social group which is student body.

Keywords: English course, higher education, neutrosociology, neutrosophic statistics

1 Introduction

The student body is a social group ([1]) that has particular characteristics. Although the members of the class group have common interests and the similar age, the selection of the class group is formally defined, with a program of study and disciplinary regulations designed by specialists that are not necessarily associated with the interests and needs of the students. Moreover, the faculty staff is also selected by the management of the study center, without the opinion of the students.

This type of social group is interesting for the sociologists. To study the needs of these people is important because they are the basis of future social groups. The better the academic preparation of people in their student stage, the greater their preparation in their professional stage. This includes the teaching of foreign languages within the curriculum.

At present, knowledge of English has become an imperative for professionals of all fields because without it they would be removed from all the scientific, social and business reality in a highly globalized world that is constantly moving and opens the doors to another world, see [2]. Therefore, the importance of knowledge of this language as an indispensable requirement in the current exchange, has been emphasized at the international level and from different perspectives, which has led to the application of different policies aimed at promoting English teaching in almost all countries of Latin America with accelerated interest, see [3].

Ecuador is prepared to this context and has established the need for learning English as a foreign language in the different educational institutions of the country. Thus, starting in the new millennium, the English language must begin to be studied according to international indicators ([4][2]) and its development is systematized from the initial levels of education until finishing at the university. Only in this way the levels required by the communicative transformation in which all educational centers are immersed, can be achieved.

However, despite these advances in learning a foreign language, students arrive at the university with a very low level of knowledge of English. This has been demonstrated by the placement tests performed on students entering the first semester of the Regional Autonomous University of Los Andes, during the previous academic periods none of them has demonstrated a high level of language proficiency, see [5].

In addition, once the LIFE course of the National Geographic Learning ([6-7]) has begun, it has been observed that despite having a textbook that meets essential premises in language teaching such as the development of the

four fundamental skills of the language, of working with very up-to-date issues regarding different spheres of life in several countries and of having a platform that supports and expands the individual work of the students, even the expected results do not cover the teachers' expectations according to the levels they are scheduled to have at the end of the third book in the series, LIFE 3 (2015). Therefore, the authors of this paper aim to assess the main results obtained so far with this series after five semesters using the aforementioned series.

To obtain the essential information in this investigation, a questionnaire was used as a technique for the survey analyzed with the Likert Scale ([8][3, 4]) in an adaptation of the Course Experience Questionnaire (CEQ 2010) of the Curtin University, Australia ([9][5]), with the objective of measuring the intensity or the degree of feeling towards various aspects related to the teaching-learning of English. The scale was applied to 83 students out of a total of 153 in the third semester for having already had previous experience of the LIFE series, which represents a sample of 54.24% of the total population. 8 of the 12 teachers who worked in these three semesters were also surveyed, representing a sample of 66.6% of this population of teachers. Twenty questions were grouped into seven fundamental groups that covered aspects related to motivation, methodology, and course organization among others.

The applied Likert scale contains among its options positive values in different gradations, as well as negative values in its different gradations, and one neutral value. Here we consider the importance of neutral responses, because the study of the social phenomenon would not be complete if the neutrality given by indifference or contradiction of opinions is not taking into account. That is why we process the data given on the Likert scale in a different way than the traditional manner, where we separate the percentages of positive, negative and neutral responses in their different gradations, to evaluate the pros and cons of that series for teaching English. Although the study is restricted to students of the Regional Autonomous University of Los Andes, we think that the results of this study can be generalized to other higher level centers of the Ecuadorian universities.

That is why the present study will be based on the Neutrosophic Sociology or briefly Neutrosociology, see [10]. Neutrosociology is the study of sociology using neutrosophic scientific methods. The huge social data that we face in sociology is full of indeterminacy: it is vague, incomplete, contradictory, hybrid, biased, ignorant, redundant, superfluous, meaningless, ambiguous, unclear, etc. That is why the neutrosophic sciences (which deal with indeterminacy) should be involved, such as: neutrosophy, neutrosophic set, neutrosophic logic, neutrosophic probability and neutrosophic statistics, neutrosophic analysis, neutrosophic measure, and so on.

Neutrosophic probability and neutrosophic statistics are used to study and analyze social facts, behaviors, and causes, see [11][6] . Neutrosophic Statistics refers to a set of data, such that the data or a part of it are indeterminate in some degree, and to methods used to analyze them.

This paper is divided according to the following structure; Section 2 describes some tools of Neutrosociology and Likert scale. Section 3 describes the results obtained from the study conducted at UNIANDES. The last section is dedicated to draw conclusions.

2 Materials and Methods

This section is dedicated to summarize the main concepts and definitions of the Neutrosophic Sociology. Additionally, we describe some details about evaluation with Likert scale.

2.1 Neutrosophic Sociology

According to Smarandache "the sociology is the neutrosophic scientific study of society", see [10]. This is because when social phenomena are analyzed, it is not ruled out that there is a certain degree of indeterminacy, inaccuracy, contradiction, indifference, among others.

In modern societies, in addition to each individual as a basic unit, there are different groups of people where there are interactions within the group and between the groups, having some degree of internal and external cooperation and also of competence, conflict, lack of communication and information. The tools for the study of the Neutrosophic Sociology is the Neutrosophic Statistics, where the data, the populations, the parameters of the distribution functions, the hypothesis tests, among others, manifest themselves in a somewhat imprecise way.

Each neutrosophic concept, phenomenon, entity, can be measured based on the Neutrosophic Logic ([12-13]), where semantics are defined as follows:

Given P a proposition it can be measured with a triple of values as it is shown in Equation 1.

$$NL(P) = (t, i, f) \qquad (1)$$

Where NL is the logical evaluation of P, such that this is t% true, i% indeterminate and f% false, and $0 \leq t+i+f \leq 3$.

In the case of working with Neutrosophic Statistics or Neutrosophic Probability, these three values can mean that if P is an event, t is the expected percentage of occurrence of P, f is the percentage of non-occurrence, while i is the percentage where there are contradictions of viewpoints, lack of information, indifference, among others, and $0 \leq t+i+f \leq 1$.

In addition, the triad that represents the semantics of neutrosophic logic can be generalized to the Refined Neutrosophic Logic ([14-15][7]), where more than one value of truthfulness, indeterminacy or falsehood can be

considered.

In general, semantics can be generalized as shown in Equation 2.

$$RNL(P) = (t_1,..,t_l, i_1,…, i_m, f_1,…, f_n) \qquad (2)$$

Where $t_1,..,t_l, i_1,…, i_m, f_1,…, f_n \in [0, 1]$, such that l, m, n ≥ 1 and $0 \leq \sum_{i=1}^{l} t_i + \sum_{j=1}^{m} i_j + \sum_{k=1}^{n} f_k \leq l + m + n$.

A social change makes the society to get degrees of evolutions $(\mathcal{T}_1, \mathcal{T}_2, …)$ with respect to each of some social parameters, degrees of involution $(\mathcal{F}_1, \mathcal{F}_2, …)$ with respect to each of the other social parameters, and degrees of neutralities (neither evolution, nor involution) $(\mathcal{I}_1, \mathcal{I}_2, …, \mathcal{I}_n, n \geq 0)$ with respect to each of a third set of social parameters, and degrees of uncertainties (not clear if it is evolution or involution) $(\mathcal{I}_{n+1}, \mathcal{I}_{n+2}, …)$ with respect to each of a fourth set of social parameters, see [10].

2.2 The Likert scale

The Likert Scale was first introduced in 1932 and is very popular in psychometric tests, see [16]. This consists of asking questions to the enquired person to determine his/her personality trait, ability, perception. A set of possible answers with different degrees of acceptance, refutation and neutrality is proposed to the person.

Although the number of possible answers is not unique, the most common number of them is 5, even though it can be an even number, or a larger odd number, see [8, 16-18]. A neutral value is usually included (I don't know, I don't care, undecided). The greater the number of possible responses, the greater the accuracy of the responses, and the respondent will have more opportunity to express what he/she really thinks. In this case the approximation to what the respondent responds is greater.

On the other hand, if the number of possible responses is even, the positive responses will necessarily have either greater or lesser gradation than the negative responses and this asymmetry may impair the respondent's opportunity to be more precise in the responses.

As we emphasized earlier, the most common scale consists of 5 possible answers that is a symmetric scale, an example is the following:
1. strongly approve,
2. approve,
3. undecided,
4. disapprove,
5. strongly disapprove.

This scale is not formed of continuous variables and can be applied to a set of questions. The final value can be ordinal or an interval, and it is preferred to apply the median, mode, or frequency, rather than the mean or variance. The final processing to the set of questions can be done with the support of nonparametric techniques such as Chi-square test, Kendall Tau B or C test.

The study we do is not applied to a single person; we want to know the opinion of a social group, in the specific context of their opinion on the LIFE program for learning English. However, we think that this study can serve at least as an indication of the opinion of any group of higher education in Ecuador that uses this program.

Particularly in this paper we will not do a classic processing of the data obtained through the Likert scale, but from a scale of 5 elements we will determine the percentage of cases for each of the options, for all respondents, according to Formula 2. This type will allow explicit consideration of indeterminacy cases corresponding to the third point of the scale.

3 Results

The authors of this paper surveyed students of all careers who attended the third level of the Technology Transfer Center (TTC) of UNIANDES Santo Domingo, that corresponds to the third book of the LIFE series with the aim of assessing the main results obtained so far with the aforementioned Series. All teachers who at that time taught at that level were also surveyed.

Specifically, 83 students from a total of 153 in the third semester were surveyed for having already had previous experience of the LIFE series, which represents a sample of 54.24% of the total population. 8 of the 12 teachers who worked in these three semesters were also surveyed, representing a sample of 66.6% of this population of teachers.

The survey was based on the Likert scale, on a questionnaire from the Course Experience Questionnaire (CEQ 2010) of the Curtin University in Australia. The Likert scale was designed based on the following responses:
1. Strongly agree,
2. Agree,
3. Neither agree nor disagree,
4. Disagree,
5. Strongly disagree.

The results of the student survey are shown in Table 1, while the results of the teacher's survey are shown in

Table 2.

Aspect	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Total
1. Student-Teacher Interaction						
1. Dedication for explanations	51	26	5	1	0	83
2. Student-student interaction						
1. Teamwork skills	38	29	14	2	0	83
3.Rapport						
1. Teacher identifies potentialities	12	39	28	4	0	83
2. Work motivation	30	34	15	3	1	83
3. Attention to difficulties	33	28	21	0	1	83
4. Feedback						
1. Useful Feedback	30	41	9	2	1	83
2. Applicability of the learned contents	30	39	12	2	0	83
3. Knowledge of the progress of what is learned	23	46	14	0	0	83
4. The evaluation identifies weaknesses	25	39	14	5	0	83
5. Course Organization						
1. Adequate schedule	8	9	15	19	32	83
2. Evaluation frequency	23	35	21	3	1	83
3. Learning environment	25	32	20	3	3	83
6. Motivation of the course						
1. Course-specialty relationship	10	29	32	8	4	83
2. Motivation for research	14	33	28	6	2	83
3. Motivation for learning	23	31	20	3	6	83
4. Usefulness of what has been learned	30	33	13	3	4	83
7. Course Results						
1. Analysis and synthesis skills	15	30	31	4	3	83
2. Problem solving skills	12	35	24	10	2	83
3. Written and oral skills	22	34	22	4	1	83
4. Course Quality	24	34	20	2	3	83

Table 1: Results of the UNIANDES student survey according to the adaptation of the Course Experience Questionnaire of the Curtin University.

Aspect	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Total
1. Student-Teacher Interaction						
1. Dedication for explanations	5	3	0	0	0	8
2. Student-student interaction						
1. Teamwork skills	6	2	0	0	0	8
3.Rapport						
1. Enthusiasm when teaching	6	2	0	0	0	8
2. Attention to diversity	3	5	0	0	0	8
4. Feedback						

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1. Identify learning styles	0	8	0	0	0	8
2. Exams reflect learning	2	3	3	0	0	8
3. Platform utility	1	3	2	0	2	8
4. Evaluation as reproduction of learning	3	4	1	0	0	8
5. Evaluation as creation of learning	1	7	0	0	0	8
5. Course Organization						
1. Issue difficulty	2	2	4	0	0	8
2. Teamwork	5	3	0	0	0	8
3. Frequency of evaluations	2	4	0	2	0	8
4. Classroom or laboratory conditions	1	4	2	1	0	8
6. Motivation of the course						
1. Extension of the topic to the professional context	3	5	0	0	0	8
2. Correspondence between program and profession	0	2	4	1	1	8
3. Extension of the topic to the Ecuadorian context	3	4	1	0	0	8
7. Course Results						
1. Need to investigate content	4	3	0	1	0	8
2. Language skills balance	4	2	2	0	0	8
3. Applicability of issues to reality	1	6	1	0	0	8

Table 2: Results of the survey of teachers of UNIANDES according to the adaptation of Course Experience Questionnaire of the Curtin University.

We consider the result of the surveys in the form of (t_1, t_2, i, f_1, f_2) where t_1 is the percent of being very in favor of the method, t_2 is the percent of being in favor of the method, i is the percent of indeterminacy, f_1 is the percent of being against the method and f_2 is the percent of being very against the method.

These indices are calculated as the total percentage of 'Strongly agree' to calculate t_1, as the total percentage of 'Agree' to calculate t_2, as the total percentage of 'Neither agree nor disagree' to calculate i, as the total percentage of 'Disagree' to calculate f_1, and as the total percentage of 'Strongly disagree' to calculate f_2.

The results were the following:

For students we obtained the five-tuple (0.28795181, 0.39518072, 0.22771084, 0.05060241, 0.03855422).

For teachers we obtained the five-tuple (0.34210526, 0.4736842, 0.13157895, 0.03289474, 0.01973684).

As it can be seen there exists a high rate of approval of the method in both surveys, and the disapproval does not reach 1%. However, there is a considerable index of indeterminacy, of approximately 23% for students and 13% for teachers, which must be carefully studied. Let us note that these results concern with the majority of students and teachers.

Conclusion

This paper was dedicated to investigating the pros and cons of using the LIFE method at the Regional Autonomous University of the Andes, in Ecuador. To do this, a survey was applied to teachers and students who passed the third level of the method, where they had to mark answers according to a Likert scale of 5 points. It was concluded that the majority of both, the students and teachers accept the method to a greater extent, while in an almost insignificant degree they reject the method, which means that there are many pros and few cons of applying the method. The most interesting part of the study is the degree of indeterminacy or indifference, which reached more than 13%, which is a point to investigate. Both, the two positive and the two negative values did not show large differences of gradation, which is another indicator to investigate, especially the fact that the feeling of "Strongly agree" is not very different to that of merely "agree".

This study was conducted from the perspective of Neutrosociology, which means that more than a simple survey this is a study of the social group consisting of university students and their learning of the English language, which may be a valid result for the other Ecuadorian universities which use this method. Thus, that is another challenge of research and future work, the study of the acceptance of this method in other universities in the country.

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