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Multicriteria Analysis of the Violation of the Right to Education in Young People

Jairo Mauricio Puetate Paucar[1], Victor Hugo Lucero Salcedo[2], and Jaime Rodrigo Cadena Morillo[3]

[1] Universidad Regional Autónoma de los Andes (UNIANDES), Troncal de la Sierra, Tulcán, CP. 040103. Ecuador.
E-mail: ut.jairopuetate@uniandes.edu.ec
[2] Universidad Regional Autónoma de los Andes (UNIANDES), Troncal de la Sierra, Tulcán, CP. 040103. Ecuador
E-mail: ut.victorlucero@uniandes.edu.ec
[3] Universidad Regional Autónoma de los Andes (UNIANDES), Troncal de la Sierra, Tulcán, CP. 040103. Ecuador
E-mail: ut.jaimecadena@uniandes.edu.ec

Abstract. The right to education has been violated by the extinction of alimony for young people who have reached 21 years of age and are in higher education. So this research is aimed at the problem in order to raise a proposal that makes a solution viable. The research line applied in the realization of this paper is “Challenges, Perspectives and Improvement of Legal Sciences in Ecuador”. The results that are pursued with this investigation is promote good compliance with the constitutional norms of Ecuador and avoid the violation of human rights. For this, the technique known as neutrosophic AHP was applied. This is a variant of the numerical AHP designed by Saaty, which by incorporating the neutrosophic sets, the uncertainty of decision-making is taken into account, in addition to the calculation with linguistic terms and the inclusion of indeterminacy. This technique will be applied to choose between two alternatives: the convenience or not of maintaining alimony in active students over the age of 21. This analysis is complicated due to the variables to be analyzed, which is why the versatility of the chosen mathematical technique is validated.

Keywords: right to education, alimony, higher education, Neutrosophic AHP**.**

1 Introduction

This research is a current and important issue since it deals with the right to education, a topic established in the Constitution of the Republic of Ecuador and the Organic Code of Children and Adolescents[1]. This right has been violated by the extinction of alimony to young people over the age of 21 who are studying in higher education. A detailed investigation of this social phenomenon by the authors of this paper made it possible to determinate that there are not degree works or scientific articles or projects dealing with this topic in the law career at the Department of the CDIC, of the Autonomous Regional University of the Andes UNIANDES, Tulcan, as in the other extensions and the other local libraries.

According to the Constitution of the Republic of Ecuador, in its article 26, it declares that, "Education is a right of people throughout their lives and an inescapable and inexcusable duty of the State”. In the same way, article 27, second paragraph of the same norm establishes that "education is essential for the knowledge, exercise of rights and the construction of a sovereign country, and constitutes a strategic axis for national development” [2].

Based on the above-mentioned, education must be guaranteed throughout a person’s life and even more for young people who is still studying. Once their alimony has been extinguished, the constitutional guarantee is not fulfilled due to the lack of financial support from their parents. This is when the problem arises, because their parents can’t be supportive and the student needs to look for a work, they put aside their higher studies and choose not to complete them due to the lack of financial support from their parents [3-5].

As a groundwork it is necessary to state that, in Ecuador in 2003, the Organic Code of Children and Adolescents was promulgated, which was published in Official Register 737 of Jan. 3, 2003. This norm protects children and adolescents, and consider the family as a fundamental group of society as a natural environment for the growth and well-being of all its members. That is why, they must receive protection and assistance necessary to be able to fully assume their responsibilities within the community. Likewise, in accordance with the Constitution of the Republic of Ecuador, mainly in the area of human rights, exercising a power as a State of rights and justice, recognizing children and adolescents as a group of priority attention [6].

Taking into account the aforementioned, it can be said that the responsibility of the care of children and young people is shared between the State and the Family, so, it is necessary that, the average age for the completion of third-level studies is up to 24 years. As long as they can demonstrate that they are still studying. Failure to do so would result in the violation of their constitutional rights such as education, which would be evidenced by not complying with State policies, to which education refers, not only in a primary or secondary setting, but rather in a higher education setting[7-9].

With the stated in the previous paragraph, young people will have the possibility of completing their higher studies, forging themselves as a professional according to the requirements of education in Ecuador. That is why this research is aimed precisely at studying this problem, and the possible solution to reform certain articles of the Childhood and Adolescence Code. Which allow the right to education not to be violated with the extinction of alimony for young people who have reached the age of 21 and are studying at higher education. This avoid the violation of their constitutional rights from which all Ecuadorians benefit, it is for this reason that the viability of giving continuity to this research project is presented, in order to prevent the continued violation of constitutional rights and due process [10].

In terms of education, the purpose of alimony has been gaining much importance, not only in the problem of fixing the food tables. It also has been important to investigate an antecedent of the target students that have completed their studies, both primary and secondary and higher, how many of these target students have become professionals; how many of them have achieved it with the mutual sacrifice of parents; how many have done it on their own behalf who has been left with custody of them whatever the case of the father or mother. It is necessary to highlight the role of State to guarantee education for students who live without any of their parents[11].

In this social environment there are cases that, at the time of having reached the age of 21 established by law, the father or mother who is obliged to give the alimony to the young person, requests that the alimony be extinguished. Situation that occurs frequently and leaves the students unprotected, without compliance with their guarantees in various aspects, but even more so in their educational studies without being able to complete them, so it is clearly observed that there is a violation of constitutional rights. That is the aim of this investigation: the right to education, same which is legally recognized in our Carta Magna [12].

In this case, Neutrosophy will be used as a decision-making tool. Neutrosophy is the branch of philosophy that studies the origin, nature and scope of neutralities. Logic and neutrosophic sets constitute generalizations of other theories, such as fuzzy sets, intuitionist fuzzy sets, fuzzy sets in the form of intervals, among others.[13]. The use of neutrosophic sets allows, in addition to the inclusion of membership functions of truth and falsehood, also membership functions of indeterminacy[14]. This indeterminacy is present because there are contradictions, ignorance, inconsistencies, among other causes with respect to knowledge. On the other hand, the technique known as AHP (Analytic Hierarchy Process), is an easy to apply and efficient method, which allows sorting alternatives, according to an order calculated from the evaluation of a group of experts. This evaluation is carried out using a scale where the relative relationships between criteria, sub-criteria and finally the alternatives are evaluated [15-19].

Neutrosophic AHP has several advantages over classical AHP, for example, it has a structure framework richer than classical AHP, fuzzy AHP and intuitionistic fuzzy AHP. It describes the expert's judgment values efficiently managing vagueness and uncertainty over fuzzy AHP and intuitionist fuzzy AHP because it considers three different degrees: degree of membership, degree of indeterminacy and degree of non-membership. Another advantage is that it is calculated from linguistic terms, which allows a more natural communication with experts [20-27].

Likewise, it can be said that this analysis is carried out in order to allow young people to benefit from the alimony, at least until their professional training, or that they can subsist on their own, without depending neither on the father nor the mother. That is considered the best alternative solution to comply with the Good Living of which all Ecuadorians are worthy, that is why the subject to be discussed presents the sustenance and importance, being therefore viable the present investigation to formulate a proposal of solution. The objective of this paper is to highlight the importance of alimony for students over 21 years who are still studying in higher education.

Due to the complexity and sensitivity of the subject to be discussed, we decided to use a mathematical tool to compare criteria from experts, specifically the neutrosophic AHP. This technique was selected, in addition to its simplicity and effectiveness, because usually the authors of the topic evaluate the aspects qualitatively in the form of linguistic terms. In this case, only two alternatives will be evaluated, Criterion 1 and Criterion 2, which is the symbolic way it will be used to determine the importance of the issue in question.

2 Neutrosophic Analytic Hierarchy Process

This section summarizes the definitions, theories and methods that will be used to achieve the objective proposed in this article.

First, to apply the technique known as AHP[28, 29], it is necessary to start from the evaluation of a group of experts to solve a specific problem, which has a main objective. This technique is usually represented graphically with a tree, see Figure 1, where the highest level node is unique and represents the Objective of the task, the children of this node in the immediately lower level represent the criteria that will be used to measure the fulfillment of the objective. At the lower level, the sub-criteria used to detail the previous criteria can be represented, further down, other sub-criteria can be represented and so on. The last level contains the nodes that represent the alternatives to be evaluated with respect to each of the criteria and sub-criteria of the higher levels.

See that the tree shown in Figure 1 represents an AHP with four levels, although the number of levels could be increased by adding more sub-criteria or one level could be reduced by eliminating the third one that represents sub-criteria [22-26].

As in this article the Neutrosophic AHP method will be developed [30, 31], below are the main definitions of neutrosophic logic[32-34] and its application in the neutrosophic AHP.

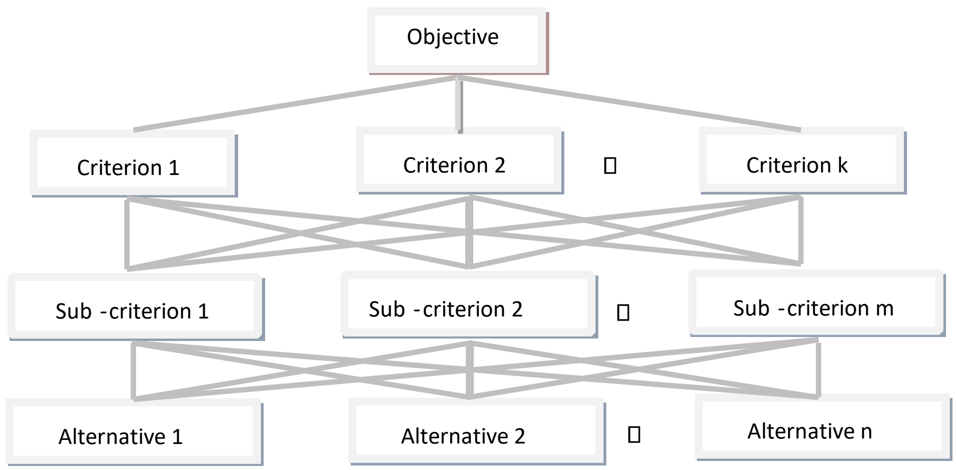

Figure 1. Tree-shaped diagram of the elements necessary to apply the AHP technique.

Definition 1: [35-44] The *Neutrosophic set* N is characterized by three membership functions, which are the truth-membership function T_A, indeterminacy-membership function I_A, and falsehood-membership function F_A, where U is the Universe of Discourse and $\forall x \in U$, $T_A(x), I_A(x)$, and $F_A(x) \subseteq]^-0, 1^+[$, and $^-0 \leq \inf T_A(x) + \inf I_A(x) + \inf F_A(x) \leq \sup T_A(x) + \sup I_A(x) + \sup F_A(x) \leq 3^+$.

Notice that according to the definition, $T_A(x), I_A(x)$, and $F_A(x)$ are real standard or non-standard subsets of $]^-0, 1^+[$ and hence, $T_A(x), I_A(x)$, and $F_A(x)$ can be subintervals of $[0, 1]$.

Definition 2: [35-44] The *Single-Valued Neutrosophic Set* (SVNS) N over U is $A = \{< x; T_A(x), I_A(x), F_A(x) >: x \in U\}$, where $T_A: U \rightarrow [0, 1], I_A: U \rightarrow [0, 1]$, and $F_A: U \rightarrow [0, 1]$, $0 \leq T_A(x) + I_A(x) + F_A(x) \leq 3$.

The *Single-Valued Neutrosophic number* (SVNN) is represented by $N = (t, i, f)$, such that $0 \leq t, i, f \leq 1$ and $0 \leq t + i + f \leq 3$.

Definition 3: [35-44] The *single-valued trapezoidal neutrosophic number*,

$\tilde{a} = \langle (a_1, a_2. a_3, a_4); \alpha_{\tilde{a}}, \beta_{\tilde{a}}, \gamma_{\tilde{a}} \rangle$, is a neutrosophic set on $\mathbb{R}$, whose truth, indeterminacy and falsehood membership functions are defined as follows, respectively:

$$T_{\tilde{a}}(x) = \begin{cases} \alpha_{\tilde{a}}\left(\frac{x-a_1}{a_2-a_1}\right), & a_1 \leq x \leq a_2 \\ \alpha_{\tilde{a}}, & a_2 \leq x \leq a_3 \\ \alpha_{\tilde{a}}\left(\frac{a_3-x}{a_3-a_2}\right), & a_3 \leq x \leq a_4 \\ 0, & \text{otherwise} \end{cases} \quad (1)$$

$$I_{\tilde{a}}(x) = \begin{cases} \frac{\left(a_2 - x + \beta_{\tilde{a}}(x - a_1)\right)}{a_2 - a_1}, & a_1 \le x \le a_2 \\ \beta_{\tilde{a}}, & a_2 \le x \le a_3 \\ \frac{\left(x - a_2 + \beta_{\tilde{a}}(a_3 - x)\right)}{a_3 - a_2}, & a_3 \le x \le a_4 \\ 1, & \text{otherwise} \end{cases} \quad (2)$$

$$F_{\tilde{a}}(x) = \begin{cases} \frac{\left(a_2 - x + \gamma_{\tilde{a}}(x - a_1)\right)}{a_2 - a_1}, & a_1 \le x \le a_2 \\ \gamma_{\tilde{a}}, & a_2 \le x \le a_3 \\ \frac{\left(x - a_2 + \gamma_{\tilde{a}}(a_3 - x)\right)}{a_3 - a_2}, & a_3 \le x \le a_4 \\ 1, & \text{otherwise} \end{cases} \quad (3)$$

Where $\alpha_{\tilde{a}}, \beta_{\tilde{a}}, \gamma_{\tilde{a}} \in [0,1]$, $a_1, a_2, a_3, a_4 \in \mathbb{R}$ and $a_1 \le a_2 \le a_3 \le a_4$.

Definition 4: ([35-44]) Given $\tilde{a} = \langle (a_1, a_2, a_3, a_4); \alpha_{\tilde{a}}, \beta_{\tilde{a}}, \gamma_{\tilde{a}} \rangle$ and $\tilde{b} = \langle (b_1, b_2, b_3, b_4); \alpha_{\tilde{b}}, \beta_{\tilde{b}}, \gamma_{\tilde{b}} \rangle$ two single-valued trapezoidal neutrosophic numbers and λ any non-null number in the real line. Then, the following operations are defined:

1. Addition: $\tilde{a} + \tilde{b} = \langle (a_1 + b_1, a_2 + b_2, a_3 + b_3, a_4 + b_4); \alpha_{\tilde{a}} \wedge \alpha_{\tilde{b}}, \beta_{\tilde{a}} \vee \beta_{\tilde{b}}, \gamma_{\tilde{a}} \vee \gamma_{\tilde{b}} \rangle$
2. Subtraction: $\tilde{a} - \tilde{b} = \langle (a_1 - b_4, a_2 - b_3, a_3 - b_2, a_4 - b_1); \alpha_{\tilde{a}} \wedge \alpha_{\tilde{b}}, \beta_{\tilde{a}} \vee \beta_{\tilde{b}}, \gamma_{\tilde{a}} \vee \gamma_{\tilde{b}} \rangle$
3. Inversion: $\tilde{a}^{-1} = \langle ({a_4}^{-1}, {a_3}^{-1}, {a_2}^{-1}, {a_1}^{-1}); \alpha_{\tilde{a}}, \beta_{\tilde{a}}, \gamma_{\tilde{a}} \rangle$, where $a_1, a_2, a_3, a_4 \neq 0$.
4. Multiplication by a scalar number:

$$\lambda\tilde{a} = \begin{cases} \langle (\lambda a_1, \lambda a_2, \lambda a_3, \lambda a_4); \alpha_{\tilde{a}}, \beta_{\tilde{a}}, \gamma_{\tilde{a}} \rangle, & \lambda > 0 \\ \langle (\lambda a_4, \lambda a_3, \lambda a_2, \lambda a_1); \alpha_{\tilde{a}}, \beta_{\tilde{a}}, \gamma_{\tilde{a}} \rangle, & \lambda < 0 \end{cases}$$

5. Division of two trapezoidal neutrosophic numbers:

$$\frac{\tilde{a}}{\tilde{b}} = \begin{cases} \langle \left(\frac{a_1}{b_4}, \frac{a_2}{b_3}, \frac{a_3}{b_2}, \frac{a_4}{b_1}\right); \alpha_{\tilde{a}} \wedge \alpha_{\tilde{b}}, \beta_{\tilde{a}} \vee \beta_{\tilde{b}}, \gamma_{\tilde{a}} \vee \gamma_{\tilde{b}} \rangle, a_4 > 0 \text{ and } b_4 > 0 \\ \langle \left(\frac{a_4}{b_4}, \frac{a_3}{b_3}, \frac{a_2}{b_2}, \frac{a_1}{b_1}\right); \alpha_{\tilde{a}} \wedge \alpha_{\tilde{b}}, \beta_{\tilde{a}} \vee \beta_{\tilde{b}}, \gamma_{\tilde{a}} \vee \gamma_{\tilde{b}} \rangle, a_4 < 0 \text{ and } b_4 > 0 \\ \langle \left(\frac{a_4}{b_1}, \frac{a_3}{b_2}, \frac{a_2}{b_3}, \frac{a_1}{b_4}\right); \alpha_{\tilde{a}} \wedge \alpha_{\tilde{b}}, \beta_{\tilde{a}} \vee \beta_{\tilde{b}}, \gamma_{\tilde{a}} \vee \gamma_{\tilde{b}} \rangle, a_4 < 0 \text{ and } b_4 < 0 \end{cases}$$

6. Multiplication of two trapezoidal neutrosophic numbers:

$$\tilde{a}\tilde{b} = \begin{cases} \langle (a_1 b_1, a_2 b_2, a_3 b_3, a_4 b_4); \alpha_{\tilde{a}} \wedge \alpha_{\tilde{b}}, \beta_{\tilde{a}} \vee \beta_{\tilde{b}}, \gamma_{\tilde{a}} \vee \gamma_{\tilde{b}} \rangle, & a_4 > 0 \text{ and } b_4 > 0 \\ \langle (a_1 b_4, a_2 b_3, a_3 b_2, a_4 b_1); \alpha_{\tilde{a}} \wedge \alpha_{\tilde{b}}, \beta_{\tilde{a}} \vee \beta_{\tilde{b}}, \gamma_{\tilde{a}} \vee \gamma_{\tilde{b}} \rangle, & a_4 < 0 \text{ and } b_4 > 0 \\ \langle (a_4 b_4, a_3 b_3, a_2 b_2, a_1 b_1); \alpha_{\tilde{a}} \wedge \alpha_{\tilde{b}}, \beta_{\tilde{a}} \vee \beta_{\tilde{b}}, \gamma_{\tilde{a}} \vee \gamma_{\tilde{b}} \rangle, & a_4 < 0 \text{ and } b_4 < 0 \end{cases}$$

Where, $\wedge$ is a t-norm and $\vee$ is a t-conorm.

Definitions 3 and 4 refer to *single-valued triangular neutrosophic number* when the condition $a_2 = a_3$ holds [40].

We can find in [45] the theory of AHP technique in a neutrosophic framework. Thus, we can model the indeterminacy of decision-making from applying neutrosophic AHP or NAHP for short.

Equation 4 contains a generic neutrosophic pair-wise comparison matrix for NAHP.

$$\tilde{A} = \begin{bmatrix} \tilde{1} & \tilde{a}_{12} & \cdots & \tilde{a}_{1n} \\ \vdots & & \ddots & \vdots \\ \tilde{a}_{n1} & \tilde{a}_{n2} & \cdots & \tilde{1} \end{bmatrix} \quad (4)$$

Matrix $\tilde{A}$ must satisfy condition $\tilde{a}_{ji} = \tilde{a}_{ij}^{-1}$, based on the inversion operator of Definition 4, according to the scale summarized in Table 1 of triangular neutrosophic numbers.

For converting neutrosophic triangular numbers into crisp numbers, there are two indexes defined in [46], they are the so-called score and accuracy indexes, respectively, see Equations 5 and 6:

$$S(\tilde{a}) = \frac{1}{8}[a_1 + a_2 + a_3](2 + \alpha_{\tilde{a}} - \beta_{\tilde{a}} - \gamma_{\tilde{a}}) \quad (5)$$

$$A(\tilde{a}) = \frac{1}{8}[a_1 + a_2 + a_3](2 + \alpha_{\tilde{a}} - \beta_{\tilde{a}} + \gamma_{\tilde{a}}) \quad (6)$$

Saaty's scale	Definition	Neutrosophic Triangular Scale
1	Equally influential	$\tilde{1} = \langle(1,1,1); 0.50, 0.50, 0.50\rangle$
3	Slightly influential	$\tilde{3} = \langle(2,3,4); 0.30, 0.75, 0.70\rangle$
5	Strongly influential	$\tilde{5} = \langle(4,5,6); 0.80, 0.15, 0.20\rangle$
7	Very strongly influential	$\tilde{7} = \langle(6,7,8); 0.90, 0.10, 0.10\rangle$
9	Absolutely influential	$\tilde{9} = \langle(9,9,9); 1.00, 0.00, 0.00\rangle$
2, 4, 6, 8	Sporadic values between two close scales	$\tilde{2} = \langle(1,2,3); 0.40, 0.65, 0.60\rangle$ $\tilde{4} = \langle(3,4,5); 0.60, 0.35, 0.40\rangle$ $\tilde{6} = \langle(5,6,7); 0.70, 0.25, 0.30\rangle$ $\tilde{8} = \langle(7,8,9); 0.85, 0.10, 0.15\rangle$

Table 1. Saaty's scale translated to a neutrosophic triangular scale.

Other definitions that are needed to apply the neutrosophic AHP are expressed below: To get the score and the accuracy degree of $\tilde{a}_{ji}$ the following equations are used:

$$\mathbf{S}(\tilde{a}_{ji}) = 1/\mathbf{S}(\tilde{a}_{ij}) \quad (7)$$

$$\mathbf{A}(\tilde{a}_{ji}) = 1/\mathbf{A}(\tilde{a}_{ij}) \quad (8)$$

With compensation by accuracy degree of each triangular neutrosophic number in the neutrosophic pair-wise comparison matrix, we derive the following deterministic matrix:

$$A = \begin{bmatrix} 1 & a_{12} & \cdots & a_{1n} \\ \vdots & & \ddots & \vdots \\ a_{n1} & a_{n2} & \cdots & 1 \end{bmatrix} \quad (9)$$

Next, we determine the ranking of priorities from the previous matrix as follows:
1. Normalize the column entries by dividing each entry by the sum of the column.
2. Take the total of the row averages.

The *Consistency Index* (CI) is calculated for matrices in formula 9, which is a function depending on λ_{max}, the maximum eigenvalue of the matrix. Saaty establishes that consistency of the evaluations can be determined by equation $CI = \frac{\lambda_{max} - n}{n-1}$, [47],where n is the order of the matrix. Also, the *Consistency Ratio* (CR) is defined by equation CR = CI/RI, where RI is given in Table 2.

Order(n)	1	2	3	4	5	6	7	8	9	10
RI	0	0	0.52	0.89	1.11	1.25	1.35	1.40	1.45	1.49

Table 2. RI associated to every order.

If CR≤0.1 we can consider that experts' evaluation is sufficiently consistent and hence we can proceed to use NAHP. We apply this procedure to matrices A in Equation 9. Consult [45] for more details on NAHP.

The Neutrosophic AHP consists of applying the following steps:

1. Select a group of experts who are capable of conducting the analysis.
2. The experts must design an AHP tree, like the one shown in Figure 1. This implies that the criteria, sub-criteria and alternatives must be specified to carry out the evaluation.
3. Create the matrices for each level of the AHP tree for the criteria, sub-criteria and alternatives, according to the evaluations of the experts expressed in the form of SVTNN scales, as specified in Equation 5.

These matrices are formed by comparing the importance of each pair of criteria, sub-criteria and alternatives, following the scales that appear in Table 1.

4. Verify the consistency of the evaluations for each matrix. For this it is enough to convert $\widetilde{A}$ in a numerical matrix M = (a_{ij}): nxm, such that $a_{ij} = A(\tilde{a}_{ij})$ or $a_{ij} = S(\tilde{a}_{ij})$, defined in one of the

Equations 6 and 7, to then apply the methods used in the original AHP. Which consists of the following:

- Calculate the Consistency Index (CI): it depends on λ_{max}, the maximum eigenvalue of the matrix M and which is defined by:

$$\mathrm{CI} = \frac{\lambda_{\max} - n}{n - 1} \tag{8}$$

Where n is the order of the matrix.

- Calculate the Consistency Ratio (PC): with equation PC = IC / IR, where IR is taken from Table 2 [7, 48, 49].

Order (n):	1	2	3	4	5	6	7	8	9	10
IR	0	0	0,52	0,89	1,11	1,25	1,35	1,40	1,45	1,49

Table 2. IR associated with the order of the matrix

- If PC≤10% consistency of evaluation by experts is considered sufficient and the AHP method can be applied. If not, it is recommended that the experts reconsider their evaluations.

5. From here on the matrices they are replaced by their equivalent numerical matrices M, calculated in the previous step. Then proceed as follows:
   - Normalize the entries by column, dividing the elements in the column by the total sum.
   - Calculate the total of the averages per row, each of these vectors is known as a priority vector.
6. The final scores are calculated starting from the highest level (Objective): to the lowest level (Alternatives): where the weights obtained for the priority vector corresponding to the immediately higher level are taken into account. This calculation is performed by multiplying each row of the matrix of priority vectors of the lower level by the weight obtained by each of these with respect to those of the upper level, then it is added per row and this is the final weight of the element of this matrix.

3 Results

In this section, the Neutrosophic AHP technique will be applied to determine the importance of the subject under study. First, a group of seven specialists or experts was appointed, who have studied in depth the contribution and importance of maintaining alimony to young people once they have reached the age of 21 and are in higher education. This study included a review of study programs, interviews with teachers, visits to classes, interviews with UNIANDES executives, among other activities. It was decided to evaluate the following alternatives:

1. Alternative 1, it is important to grant alimony to young people who have reached the age of 21 and are studying in higher education.

2. Alternative 2, maintain the extinction of alimony to young people who have reached age of 21 and are studying in higher education.

Table 3 shows the experts' evaluation of the criteria to measure the alternatives. We make reference to the number assigned to the criterion and not to the description in words.

Criterion	1	2	3	4	5	6	7
1	$\tilde{1}$	$\tilde{5}$	$\tilde{5}$	$\tilde{5}$	$\tilde{3}$	$\tilde{3}$	$\tilde{3}$
2	$\tilde{5}^{-1}$	$\tilde{1}$	$\tilde{5}$	$\tilde{3}$	$\tilde{3}^{-1}$	$\tilde{1}$	$\tilde{3}^{-1}$
3	$\tilde{5}^{-1}$	$\tilde{5}^{-1}$	$\tilde{1}$	$\tilde{3}$	$\tilde{3}^{-1}$	$\tilde{5}^{-1}$	$\tilde{5}^{-1}$
4	$\tilde{5}^{-1}$	$\tilde{3}^{-1}$	$\tilde{3}^{-1}$	$\tilde{1}$	$\tilde{5}^{-1}$	$\tilde{5}^{-1}$	$\tilde{5}^{-1}$
5	$\tilde{3}^{-1}$	$\tilde{3}$	$\tilde{3}$	$\tilde{5}$	$\tilde{1}$	$\tilde{3}$	$\tilde{3}$
6	$\tilde{3}^{-1}$	$\tilde{1}$	$\tilde{5}$	$\tilde{5}$	$\tilde{3}^{-1}$	$\tilde{1}$	$\tilde{1}$
7	$\tilde{3}^{-1}$	$\tilde{3}$	$\tilde{5}$	$\tilde{5}$	$\tilde{3}^{-1}$	$\tilde{1}$	$\tilde{1}$

Table 3. Matrix of the evaluation of the criteria according to the experts, using linguistic values.

Then the values given in the form of linguistic terms are converted into numerical values, as expressed in Table 4, using the function a (□): given in Equation 7. In addition, the value of IC and PC is added see Equation 5 and λ_{max}, calculated with the eigenvalue function of the Octave 4.2.1 software. For the rest of the calculations this software was used, [6]. Finally we can see the calculation of the priority vector.

Criterion	1	2	3	4	5	6	7	Priority Vector
1	0.9375	5.1562	5.1562	5.1562	2.6437	2.6437	2.6437	0.334410
2	0.2120	0.9375	5.1562	2.6437	0.3182	0.9375	0.3182	0.096940
3	0.2120	0.2120	0.9375	2.6437	0.3182	0.2120	0.2120	0.050220
4	0.2120	0.3182	0.3182	0.9375	0.2120	0.2120	0.2120	0.035719
5	0.3182	2.6437	2.6437	5.1562	0.9375	2.6437	2.6437	0.208733
6	0.3182	0.9375	5.1562	5.1562	0.3182	0.9375	0.9375	0.127504
7	0.3182	2.6437	5.1562	5.1562	0.3182	0.9375	0.9375	0.146474
λ_{max}= 7.46869, CI = 0.078115; PC = 5.7863%≤10%								

Table 4. Matrix of the evaluation of the criteria according to the experts, using numerical values. Are added IC, PC, λ_{max} and the priority vector.

Then the comparison between both alternatives is summarized for each of the criteria from 1 to 7, see Table 5-11. For each cell, the values are given in the form of the linguistic terms in the scale of Table 1 and their corresponding numerical value calculated by Equation 7. It should be noted that it is not necessary to calculate the PC, by the order of the matrix that only is 2.

Criterion 1			
	Alternative 1	Alternative 2	Priority Vector
Alternative 1	$\tilde{1}$ (0.9375):	$\tilde{1}$ (0.9375):	0.5
Alternative 2	$\tilde{1}$ (0.9375):	$\tilde{1}$ (0.9375):	0.5

Table 5. Comparison of the alternatives with respect to Criterion 1 and its priority vector.

Criterion 2			
	Alternative 1	Alternative 2	Priority Vector
Alternative 1	$\tilde{1}$ (0.9375):	$\tilde{2}$ (1.8375):	0.64380
Alternative 2	$\tilde{2}^{-1}$ (0.56146):	$\tilde{1}$ (0.9375):	0.35620

Table 6. Comparison of the alternatives with respect to Criterion 2 and its priority vector.

Criterion 3			
	Alternative 1	**Alternative 2**	**Priority Vector**
Alternative 1	$\tilde{1}$ (0.9375):	$\tilde{3}$ (2.6437):	0.74240
Alternative 2	$\tilde{3}^{-1}$(0.3182):	$\tilde{1}$ (0.9375):	0.25760

Table 7. Comparison of the alternatives with respect to Criterion 3 and its priority vector.

Criterion 4			
	Alternative 1	**Alternative 2**	**Priority Vector**
Alternative 1	$\tilde{1}$ (0.9375):	$\tilde{3}^{-1}$(0.3182):	0.25760
Alternative 2	$\tilde{3}$(2.6437):	$\tilde{1}$ (0.9375):	0.74240

Table 8. Comparison of the alternatives with respect to Criterion 4 and its priority vector.

Criterion 5			
	Alternative 1	**Alternative 2**	**Priority Vector**
Alternative 1	$\tilde{1}$ (0.9375):	$\tilde{3}^{-1}$(0.3182):	0.25760
Alternative 2	$\tilde{3}$(2.6437):	$\tilde{1}$ (0.9375):	0.74240

Table 9. Comparison of the alternatives with respect to Criterion 5 and its priority vector.

Criterion 6			
	Alternative 1	**Alternative 2**	**Priority Vector**
Alternative 1	$\tilde{1}$ (0.9375):	$\tilde{5}$(5.1562):	0.83087
Alternative 2	$\tilde{5}^{-1}$(0.21198):	$\tilde{1}$ (0.9375):	0.16913

Table 10. Comparison of the alternatives with respect to Criterion 6 and its priority vector.

Criterion 7			
	Alternative 1	**Alternative 2**	**Priority Vector**
Alternative 1	$\tilde{1}$ (0.9375):	$\tilde{3}$(2.6437):	0.74240
Alternative 2	$\tilde{3}^{-1}$(0.3182):	$\tilde{1}$ (0.9375):	0.25760

Table 11. Comparison of the alternatives with respect to Criterion 7 and its priority vector.

The result of the evaluation of the alternatives with respect to the criteria is shown below, where the values of the priority vector of the criteria are specified in parentheses.

Criterion	**1**(0.334)**:**	**2**(0.097):	**3 (**0.050)**:**	**4 (**0.036)**:**	**5 (**0.209)**:**	**6 (**0.128)**:**	**7 (**0.146)**:**	
Alternative 1	0.5	0.6438	0.7424	0.2576	0.2576	0.8309	0.7424	0.74455
Alternative 2	0.5	0.3562	0.2576	0.7424	0.7424	0.1691	0.2576	0.25545

Table 12. Matrix of the evaluation of the alternatives regarding the 7 criteria. The weights calculated for these can be seen in parentheses.

From the results obtained in Table 12, it can be concluded that the results obtained in Alternative 1 are preferred over those of Alternative 2. This means that the experts confer a very high importance on them. Alimony pensions to young people who have reached the age of 21 and are in higher education, 74% higher than 25% of maintaining their extinction.

Conclusions

- The methodology used during the development of this research, allowed to carry out an analysis of the different positions, and to determine the need to propose the reform of the article that deals with the extinction of the alimony within the Ecuadorian legislation.
- With the study, it was possible to determine that the present research work is framed within the legal field, it is a current problem and there was a need to demonstrate the great importance for the beneficiaries of the problem raised through a mathematical tool.
- The technique known as Neutrosophic AHP, yielded as a result that it is very important to grant alimony to young people who have reached the age of 21 and are studying in higher education.

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