

## Chapter 15

# The Use of Neutrosophic Linear Programming Method in the Field of Education

Maissam Ahmed Jdid

 <https://orcid.org/0000-0003-4413-4783>

Al Sham Private University, Syria

### ABSTRACT

*In light of the great development witnessed by all fields of science, it was necessary to keep pace with this development, benefit from it, and adapt it to serve humanity through organized observation of natural events and conditions, discovering facts, formulating appropriate laws for those facts, and exploiting available resources. By using operations research methods, we can face most problems and find solutions, which prompted many researchers and scholars in the field of education to claim the need to use these methods in the management of educational institutions and to include them in the curricula for students in the early educational stages. The authors prepared this study using the concepts of neutrosophic logic through which they present some problems that can be converted into linear neutrosophic models, which can be used in the management of educational institutions and also be included in academic curricula.*

### INTRODUCTION

Operations research is one of the modern applied sciences that are concerned with the optimal allocation of scarce resources, its main focus is the existence of a problem that requires decision-making and the need for operations research increases as the complexity of the problem increases. The science of operations research depends on the use of mathematical models as a template in which the administrative problem is formulated, but the success of the formation and application of the model depends on the decision maker and the success of the process of collecting data for the model and verifying the validity of its representation of reality and its application depends on the possibility of good communication with those who have information. The use of operations research methods requires analyzing the issue

DOI: 10.4018/978-1-6684-7836-3.ch015

## ***The Use of Neutrosophic Linear Programming Method***

and developing a list of basic decisions that must be made, and determining the relationship between these decisions and the external factors that affect them, after conducting the appropriate analysis of the problem, the mathematical model is formulated by translating linguistic expressions into mathematical relationships. It includes in its composition a set of variables whose values we must determine to reach the goal, which is to increase profits or decrease costs, the values of the variables are determined by solving the mathematical model by using methods for the type of model.

The model may be linear, nonlinear, or dynamic, and the optimal solution is the values of the unknown quantities in the problem, after obtaining the solution we must make sure that it satisfies the conditions of the problem (Alali, 2004; Bukajh & Mualla, 1998; Jdid, 2021).

But when these methods are presented according to classical logic, we will face the problem of restriction and specificity favored by the results of the studies presented using classical process research methods, which may not agree with the conditions in which educational institutions operate, and since nothing is certain and that any issue may be true or false or have part of the right and part of the wrong (indeterminacy), the neutrosophic logic was the logic presented by American scientist Florentin Smarandache, Professor and Head of the Department of Mathematics and Science at the University of New Mexico, USA. In 1995 This logic came as a generalization of the fuzzy logic presented by Lotfi Zadeh in 1965, and his basic idea was to provide each case with three dimensions: true, false and indefinite, and each of them in degrees (Smarandache, 2014), which gives a more accurate description of all the phenomena studied and helps institutions to obtain results that has a margin of freedom and enable them to make ideal decisions. And appropriate to the work environment, in other words, it enables it to obtain optimal solutions that secure an ideal work environment, and since these institutions rely on operations research methods in their workflow, it was necessary to use the concepts of neutrosophic logic to reformulate those methods, we formulated some methods of operations research according to neutrosophic logic and were published in scientific journals (Alshikho et al., 2023a; Alshikho et al., 2023b; Jdid, 2023; Jdid, Alhabib, Bahbouh et al, 2022; Jdid, Alhabib, Khalid et al, 2022; Jdid et al., 2021; Jdid, Alhabib, & Salama, 2022; Jdid et al., 2023; Jdid & Hasan, 2023; Jdid, Salama, Alhabib et al, 2022; Jdid, Shahin, & Al Suleiman, 2022) and we showed through the studies presented the extent of the importance and necessity of using these concepts. We present this study for workers in the field of education and present through it one of the methods of neutrosophic process research, which is the method of linear neutrosophic programming, and the goal is to clarify how to use it in educational institutions, uses that ensure a good workflow and focus on the need to include it in the curricula for students at all educational levels.

## **MATHEMATICAL BACKGROUND**

The linear programming method is one of the most used operations research methods in the field of decision-making because it helps decision makers to choose the optimal alternative from within the group of alternatives offered, which achieves the maximum benefit for the institution and reduces losses, this method depends on converting the studied problem into a linear mathematical model and due to the importance of this method and so that we can obtain more accurate and appropriate results for real life, we have published several research papers on neutrosophic linear programming, in the search of ambiguous models (Jdid & Khalid, 2022a). We presented in which the linear neutrosophic model can write the general formula, the reference formula, the standard formula, the symmetrical formula, and in another research we presented the neutrosophic simplex method (Jdid, Salama, & Khalid, 2022) to find

14 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

[www.igi-global.com/chapter/the-use-of-neutrosophic-linear-programming-method-in-the-field-of-education/324803](http://www.igi-global.com/chapter/the-use-of-neutrosophic-linear-programming-method-in-the-field-of-education/324803)

## Related Content

---

### Application of the Neutrosophic Spherical Sets in Education

C. Antony Crispin Sweet and S. Bhuvaneshwari (2023). *Handbook of Research on the Applications of Neutrosophic Sets Theory and Their Extensions in Education* (pp. 127-160).

[www.irma-international.org/chapter/application-of-the-neutrosophic-spherical-sets-in-education/324795](http://www.irma-international.org/chapter/application-of-the-neutrosophic-spherical-sets-in-education/324795)

### Intelligent Decision Making and Risk Analysis of B2c E-Commerce Customer Satisfaction

Masoud Mohammadian (2015). *International Journal of Fuzzy System Applications* (pp. 60-75).

[www.irma-international.org/article/intelligent-decision-making-and-risk-analysis-of-b2c-e-commerce-customer-satisfaction/126199](http://www.irma-international.org/article/intelligent-decision-making-and-risk-analysis-of-b2c-e-commerce-customer-satisfaction/126199)

### Robust Stabilization And Control Of Takagi-Sugeno Fuzzy Systems With Parameter Uncertainties And Disturbances Via State Feedback And Output Feedback

Iqbal Ahammed A.K. and Mohammed Fazle Azeem (2020). *International Journal of Fuzzy System Applications* (pp. 63-99).

[www.irma-international.org/article/robust-stabilization-and-control-of-takagi-sugeno-fuzzy-systems-with-parameter-uncertainties-and-disturbances-via-state-feedback-and-output-feedback/253085](http://www.irma-international.org/article/robust-stabilization-and-control-of-takagi-sugeno-fuzzy-systems-with-parameter-uncertainties-and-disturbances-via-state-feedback-and-output-feedback/253085)

### A Generic Fuzzy-Based Recommendation Approach (GFBRA)

Ismail Bouacha and Safia Bekhouche (2022). *International Journal of Fuzzy System Applications* (pp. 1-29).

[www.irma-international.org/article/a-generic-fuzzy-based-recommendation-approach-gfbra/292461](http://www.irma-international.org/article/a-generic-fuzzy-based-recommendation-approach-gfbra/292461)

### Application of Neutrosophic Soft Set to Assess Academic Performance of Students Using Bloom's Taxonomy

Sonali Priyadarsini, Said Broumi and Ajay Vikram Singh (2023). *Handbook of Research on the Applications of Neutrosophic Sets Theory and Their Extensions in Education* (pp. 111-126).

[www.irma-international.org/chapter/application-of-neutrosophic-soft-set-to-assess-academic-performance-of-students-using-blooms-taxonomy/324794](http://www.irma-international.org/chapter/application-of-neutrosophic-soft-set-to-assess-academic-performance-of-students-using-blooms-taxonomy/324794)