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ABSTRACT

The process of selecting the best alternative among the available options is known as decision making. Because of the imprecise or fuzziness of the linguistic terms, conventional crisp techniques have not been very effective in solving Multi-Criteria Decision Making (MCDM) problems. In the real world, finding exact values for MCDM problems is difficult or impossible. As a result, it is wiser to represent the alternative values as Single-Valued Neutrosophic Sets (SVNS) when applying the criteria. The truth-membership, indeterminacy-membership, and falsity-membership degrees of the neutrosophic set are more capable of catching up incomplete information. Thus, the technique for order preference by similarity to ideal solution (TOPSIS) method is extended to the MCDM problems with single-valued neutrosophic information in this paper. This research paper can tell researchers how to rank students' level of understanding in diagnosing and treating patients effectively. Researchers and readers will be able to determine which student is the most capable in coping with emergency situations as a result of this. Furthermore, TOPSIS technique is a basic computation procedure that can be easily transcribed into a spreadsheet using the provided formula, this project is simple to comprehend. In this paper, the dental students' level knowledge are identified and ranked using the value of relative closeness coefficient and have done comparative analysis since different method have been used. TOPSIS approach used in this paper gives consistent findings with existing data from previous research.

1 INTRODUCTION

In daily lives, Multi-Criteria Decision Making (MCDM) is quite important. The goal in this competitive market is to identify the best alternative that must be evaluated against a variety of factors. However, due to the presence of various types of uncertainties in the data, which may occur due to a lack of knowledge or human error, it is often difficult for a person to choose a suitable one. As a result, the MCDM method is becoming more popular these days, and it normally requires three phases (Garg et al., 2020) that required to select an appropriate scale for evaluating the given objects. The information is then aggregated using the appropriate technique to produce the tendency value of each object. Finally, rank the objects to see which is the best.

To solve a problem in real life, many mathematical tools and models have been implemented and it is expanding year by year. For example the concept of fuzzy set has been developed to deal with the problem of uncertainty, imprecision and vagueness. It was established by Zadeh (1965). However, fuzzy set cannot express false membership and intuitionistic fuzzy set cannot handle the indeterminacy of information. So, many sets and theories were later initiated to solve the issue of impreciseness with different forms of structures. By that, neutrosophic theory was introduced by Smarandache (1998). The concept of neutrosophic sets is the combination of fuzzy sets and intuitionistic fuzzy sets (Alias & Mohamad, 2017). It is based on truth membership, T , indeterminate membership, I and false membership, F . These memberships can be assumed as positive membership, neutral membership and negative membership respectively in sentiment analysis and must satisfy $0 \leq T + I + F \leq 3$ (Smarandache, 1998).

TOPSIS which defined as Technique for Order Preference with Respect to Similarity to the Ideal Solution is a well-known method that works on the concept of selecting the best option based on its shortest distance from the target set. TOPSIS considers the two ideal solutions named Positive Ideal Solution (PIS) and Negative Ideal Solution (NIS). To obtain the goal set, TOPSIS takes into account both tendencies of similarity and dissimilarity. According to Garg