

Modelling Neutrosophic Agility Index: A Mathematical Framework

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Abstract:

Introduction: This study uses a fuzzy-based methodology that combines agility score and certainty functions to assess the values of learning mathematics quickly. The paper emphasises the need of understanding the value of learning mathematics through tools like the Neutrosophic Agility Index in addition to discussing the usage of surveys to assess it.

Objective: The aim of this study is to evaluate the values of learning mathematics' agility by employing a fuzzy based methodology that integrates score and certainty functions. Finding out how agile the values are now and looking into ways to make them more agile are the objectives.

Method: A paradigm for assessing the values of learning mathematical skills agility is established using a neutrosophic fuzzy method. The agility score is calculated to evaluate the level of agility. Additionally, the article recommends carrying out additional research using particular performance assessment standards.

Result: The findings show that, according to its agility score, the benefit of knowing mathematics is "fairly agile". It implies the possibility of more progress by putting improvement recommendations into practice. It also emphasises the relationship between performance, agility, and organisational culture, underscoring the necessity for additional research employing a variety of fuzzy methodologies.

Conclusion: In conclusion, the study is represented by agility scores corresponding to specific values. Self-confidence, with an agility score of 0.5377, ranks first, indicating reasonable confidence in decision-making. Perseverance (score: 0.5356) reflects resilience and determination. Decision-making (score: 0.5239) suggests a balanced approach. Tolerance (score: 0.5185) relates to handling diversity. Higher Order Thinking (score: 0.5166) involves cognitive abilities. The average agility score (0.5265) falls within the 'Fairly Agile' range. Enhancing these values can lead to higher agility categories.

Keywords: Neutrosophic Fuzzy, Agility Index, Decision Making.

1. Introduction:

Dealing with uncertainty and incomplete information is a fundamental challenge in many real-world problems and decision-making scenarios. Traditional mathematical frameworks, such as classical set theory and probability theory, often fail to adequately capture the nuances of vague, ambiguous, or indeterminate phenomena. In order to overcome these constraints, in the late 1990s Florentin Smarandache developed the idea of neutrosophy and neutrosophic sets. Neutrosophy offers a more thorough method of modelling uncertainty by extending the philosophical concept of neutrality to the fields of mathematical logic and set theory. By including the degree of membership, the degree of non-membership, and the degree of indeterminacy connected to each element, neutrosophic sets expand on the idea of fuzzy sets. This tripartite representation allows for a more flexible and realistic characterization of real-world objects and processes that may exhibit varying levels of truth, falsehood, and uncertainty. The neutrosophic framework has since found diverse applications in areas such as decision-making, pattern recognition and engineering problem-solving, where it has demonstrated the ability to better capture the inherent complexities of complex systems. As an active field of research and innovation, neutrosophy continues to evolve, offering new perspectives and tools for dealing with the challenges of an increasingly uncertain and interconnected world.

Agility is a multifaceted organizational capability that enables entities to thrive in dynamic, unpredictable environments. At its core, agility is the capacity to quickly sense changes in the market, customer preferences, or competitive landscape, and then swiftly mobilize resources and adapt strategies to capitalize on these shifts. Agile organizations exhibit a blend of key characteristics, including responsiveness, flexibility, adaptability, resourcefulness, and cross-functional collaboration. They are able to reconfigure processes, reallocate resources, and develop innovative solutions with speed and efficiency. This allows them to stay ahead of the curve, quickly seize new opportunities, and maintain a competitive edge. In an era of accelerating change and disruption, the ability to be agile has become a critical success factor across diverse industries, from manufacturing and supply chain management to software development and strategic decision-making. Cultivating organizational agility enables entities to navigate uncertainty, manage risks, and thrive amidst the dynamic complexity of the modern business landscape.

The Neutrosophic Agility Index is an emerging framework for assessing and quantifying organizational agility using the principles of neutrosophic logic, which extends the concepts of fuzzy logic by introducing the notion of indeterminacy. Unlike traditional agility measurement approaches, the Neutrosophic Agility Index provides a more comprehensive and nuanced evaluation of an entity's agility by considering not only the degree of membership (truth) and non-membership (falsity) of agility attributes, but also the degree of indeterminacy. This allows the framework to capture the inherent uncertainty, ambiguity, and incomplete information that may be present in the assessment of organizational agility. The framework identifies agility attributes as multidimensional, consisting of three components: the truth, the falsity, and the indeterminacy. The evaluation and aggregation of these agility attributes utilize neutrosophic set operations and inference mechanisms, resulting in a Neutrosophic Agility Index that provides a holistic representation of the organization's agility level.

This index can then be interpreted using neutrosophic scales and linguistic terms, guiding strategic decision-making, identifying areas for improvement, and enabling benchmarking against industry peers. As organizations navigate increasingly complex and dynamic environments, the Neutrosophic Agility Index offers a promising approach to assessing and enhancing organizational agility, supporting their ability to thrive amidst change and uncertainty.

2. Preliminary Detail:

2.1 Neutrosophic Set:

[30] Let U be a conversation universe. A truth-membership function ($t_A(u)$), an indeterminacy-membership function ($i_A(u)$), and a falsity-membership function ($f_A(u)$) characterise a neutrosophic fuzzy set A in U . The real standard or non-standard subsets of the unit interval $[0, 1]$ are represented by $t_A(u)$, $i_A(u)$, and $f_A(u): U \rightarrow [0, 1]$. A neutrosophic fuzzy set's three membership functions meet the following requirement: $0 \leq t_A(u) + i_A(u) + f_A(u) \leq 3$. We refer to the neutrosophic fuzzy set as:

$$A = \{ \langle u, (t_A(u), i_A(u), f_A(u)) \mid u \in U \} \quad (1)$$

The classical fuzzy set, whose membership function only accepts values in the interval $[0, 1]$, is generalised by the neutrosophic fuzzy set. The three functions associated with membership in the neutrosophic fuzzy set enable the representation of ambiguous and inconsistent data, which is very helpful in situations involving uncertainty and ambiguity when making decisions and solving problems.

2.2 Operations of Neutrosophic Sets:

The operations of neutrosophic sets involve combining distinct sets E and F using specific mathematical formulations to capture the nuances of truth, indeterminacy, and falsity. For the union operation ($E \oplus F$), the resulting set combines the truth-membership functions of E and F using the formula $t_E(x) + t_F(x) - t_E(x)*t_F(x)$, which ensures that overlapping truths do not exceed the logical boundary of 1. The indeterminacy membership function is combined multiplicatively as $i_E(x)*i_F(x)$, while the falsity membership function is also combined multiplicatively as $f_E(x)*f_F(x)$. For the intersection operation ($E \otimes F$), the truth-membership functions are combined multiplicatively as $t_E(x)*t_F(x)$, ensuring a conservative estimate of overlapping truths.

The indeterminacy and falsity membership functions are combined using the formula $i_E(x) + i_F(x) - i_E(x)*i_F(x)$ and $f_E(x) + f_F(x) - f_E(x)*f_F(x)$ respectively, capturing the logical interplay between the two sets. These operations enable a nuanced and flexible representation of combined sets, reflecting the complexities and interdependencies of real-world phenomena in a manner that traditional set theory cannot. Consider that E and F are distinct neutrosophic sets. Then,

$$E \oplus F = \{ \langle x, t_E(x) + t_F(x) - t_E(x)*t_F(x), i_E(x)*i_F(x), f_E(x)*f_F(x) \rangle \mid x \in X \} \quad (2)$$

$$E \otimes F = \{ \langle x, t_E(x)*t_F(x), i_E(x) + i_F(x) - i_E(x)*i_F(x), f_E(x) + f_F(x) - f_E(x)*f_F(x) \rangle \mid x \in X \} \quad (3)$$

2.3 Key research articles on agility assessment frameworks:

The research by Menon and Suresh presents a Workforce Agility Index framework using fuzzy logic to assess agility in higher education institutions. Using the QADMAX thematic analysis technique, Panneerselvam's study investigates women's empowerment for improving India, specifically in Tamil Nadu. Ranjitha et al. provide a novel paradigm for evaluating agility in software development projects that makes use of 103 attributes and 23 criteria with a multi-grade fuzzy method. When Singh et al. look into COVID-19 learning loss and recovery in India, they discover a recovery that is progressive. Masilamani and Suresh use a multi-grade fuzzy technique to evaluate organisational agility in software projects from the people and culture viewpoints. Patri and Suresh employ fuzzy logic to examine the agility of a healthcare dispensary, while Vinodh and Aravindraj, as well as Vinodh and Prasanna, benchmark agility assessment approaches, primarily focusing on multi-grade fuzzy and fuzzy logic techniques in manufacturing organizations.

Lastly, Lin et al. determine potential fuzzy agility index values using fuzzy logic. Overall, these studies demonstrate the growing application of fuzzy-based frameworks and techniques for the assessment and evaluation of agility in various organizational contexts. Despite the advancements in neutrosophic logic and its application in assessing organizational agility through the Neutrosophic Agility Index, several research gaps remain. Firstly, the current literature predominantly focuses on theoretical frameworks and conceptual models, with limited empirical validation across diverse organizational contexts. There is a need for comprehensive case studies and longitudinal research to evaluate the practical effectiveness and reliability of the Neutrosophic Agility Index in real-world scenarios. Additionally, while the neutrosophic approach addresses uncertainty, ambiguity, and indeterminacy, the integration of these concepts into existing decision-making processes and organizational strategies is still underexplored. Another significant gap lies in the comparison between the Neutrosophic Agility Index and other agility assessment tools. Research comparing the accuracy, sensitivity, and overall utility of the neutrosophic approach relative to traditional methods would provide valuable insights.

Further investigation into the scalability and adaptability of the Neutrosophic Agility Index across various industries and organizational sizes is crucial for its broader application and effectiveness. While current research provides valuable insights into agility assessment within specific contexts like healthcare, education, and software development, extending its applicability to diverse sectors such as manufacturing, finance, and retail requires tailored methodologies and frameworks. Moreover, as businesses face increasingly complex challenges, there is a growing need for automated tools and software solutions that can effectively integrate neutrosophic logic into agility assessments. These tools would not only streamline the evaluation process but also enhance accuracy and reliability, thereby bridging the gap between theoretical concepts and practical implementation. By leveraging automation and advanced analytics, organizations can gain real-time insights into their agility levels, enabling proactive decision-making and strategic adaptation in dynamic environments. Addressing these gaps in research and technology development will bolster the robustness and applicability of the Neutrosophic Agility Index. It will empower organizations of varying sizes and industries to navigate uncertainty, seize opportunities, and sustain competitive

advantage amidst rapid change and disruption. Ultimately, advancing the Neutrosophic Agility Index will contribute to enhancing organizational resilience, innovation, and performance in today's intricate and evolving business landscapes.

2.4. Review of Fuzzy Agility Index:

Table :1 Paper Title, Authors and Focus.

Paper Title	Authors	Focus
Single-valued neutrosophic DEMATEL for segregating types of criteria	Abdullah, L., Ong, Z., & Mohd Mahali, S.	Subcontractor selection
A review of organizational agility concept and characteristics	Anca-Ioana, M.	Conceptual review of agility
Impact of organizational culture values on organizational agility	Felipe, C.M., Roldán, J.L., & Leal-Rodríguez, A.L.	Organizational culture and agility
Assessment of Organizational Agility in Software Projects	Masilamani, P., & Suresh, M.	Software project agility assessment
Enablers of workforce agility in engineering educational institutions	Menon, S., & Suresh, M.	Workforce agility in educational institutions
Organizational agility assessment for higher education institutions	Menon, S., & Suresh, M.	Agility assessment in higher education
Assessment framework for workforce agility in higher education institutions	Menon, S., & Suresh, M.	Framework for workforce agility assessment in higher education
Women Empowerment for Developing India: A Study of Tamil Nadu	PANNEERSELVAM, A.	Women empowerment and development
Modelling the enablers of workforce agility in IoT projects	Patil, M., & Suresh, M.	Workforce agility in IoT projects

3. Proposed Method:

3.1 Neutrosophic Agility Index (\tilde{I}):

The Neutrosophic Agility Index (\tilde{I}) is quantitatively defined as the product of Weightage (\hat{w}) and Performance (P), as indicated in sources ([4]; [18]; [19]). This relationship is expressed by the formula

$$\tilde{I} = \hat{w} * P \tag{4}$$

where the weightage represents the relative importance or influence of various agility attributes, and performance reflects the actual observed effectiveness in those areas. By combining these two factors, the Neutrosophic Agility Index provides a comprehensive measure of an organization's agility. This multiplicative approach allows for a nuanced evaluation that considers both the significance of agility components and the organization's proficiency in each area. Consequently, this index helps organizations identify specific attributes that require attention and improvement, enabling them to enhance their overall agility and better navigate the complexities and uncertainties of their operating environments.

3.2 Five Level Rating Scale:

Five levels have been assigned to the rating scales. The model is very broad and includes every component of the organisation that can impact agility. The linguistic terms used to describe the Neutrosophic Agility Index provide a structured way to interpret the agility levels of organizations based on their \tilde{I} values. These terms categorize agility into five distinct ranges: "Extremely not Agile" (0.00 to 0.20), "Not Agile" (0.21 to 0.40), "Fairly Agile" (0.41 to 0.60), "Agile" (0.61 to 0.80), and "Extremely Agile" (0.81 to 1.00). This classification allows for a nuanced understanding of an organization's agility, facilitating clearer communication and more precise benchmarking.

Table:1 Five Level Rating Scale

Linguistic Term	\tilde{I} value	
	From	To
Extremely not Agile	0.00	0.20
Not Agile	0.21	0.40
Fairly Agile	0.41	0.60
Agile	0.61	0.80
Extremely Agile	0.81	1.00

For example, an organization with a \tilde{I} value between 0.41 and 0.60 is considered "Fairly Agile," indicating a moderate level of agility with room for improvement. On the other hand, a value above 0.81 signifies that the organization is "Extremely Agile," reflecting a high capacity for rapid adaptation and responsiveness. This linguistic framework helps in identifying specific areas of strength and weakness, guiding strategic decisions and enabling organizations to focus on targeted agility enhancements to improve their overall performance in dynamic environments.

3.3 Neutrosophic Score Function:

The Neutrosophic Score function, as defined by [13], is a crucial tool for quantifying the overall neutrosophic value of a given set. Represented by the formula,

$$S(T, I, F) = ((2+tA(u)-iA(u)-fA(u))/3) \quad \text{Where } s: M \rightarrow [0, 1] \quad (5)$$

This function calculates the score by averaging the neutrosophic components: truth ($tA(u)$), indeterminacy ($iA(u)$), and falsity ($fA(u)$). Here, the score function (s) maps a set M to a value within the range $[0, 1]$. By incorporating these three dimensions, the Neutrosophic Score provides a balanced measure that reflects the positive influence of truth while accounting for the negative impacts of indeterminacy and falsity.

The addition of 2 ensures that the resulting score remains within the desired range, adjusting for the subtraction of the indeterminacy and falsity components. This scoring mechanism offers a nuanced and comprehensive evaluation of the neutrosophic set, enabling better decision-making and analysis in complex systems characterized by varying degrees of certainty, ambiguity, and falsehood.

3.4 Neutrosophic Certainty Function:

The Neutrosophic Certainty function, as outlined by [13], serves as a measure of the true positive rate within a neutrosophic framework. Represented by the formula,

$$c(T, I, F) = tA(u) \quad \text{Where } c: M \rightarrow [0, 1] \quad (6)$$

This function isolates and evaluates the truth component ($tA(u)$) of a neutrosophic set. Here, the certainty function (c) maps a set M to a value between $[0, 1]$, focusing exclusively on the degree of truth or accuracy within the set. This singular focus on the truth component allows the Neutrosophic Certainty function to provide a clear and direct assessment of the positive certainty associated with a classifier or decision-making process.

By emphasizing the true positive rate, this function facilitates the identification of reliable and accurate outcomes, crucial for applications requiring high levels of precision and dependability. This straightforward yet powerful metric is essential in scenarios where the truthfulness of data or results needs to be quantified independently of the accompanying indeterminacy and falsity components, offering a robust tool for evaluating performance in uncertain.

4. Neutrosophic Agility Index Methodology:

In the methodology for determining the Neutrosophic Agility Index, a comprehensive survey was conducted to assess the values of learning mathematics among students. A total of 110 students participated, providing insights into six key values: Self-confidence, Tolerance, Decision-making, Perseverance, and Higher Order Thinking. Each student's responses were analyzed using the neutrosophic framework to calculate individual agility scores for these values. The ranking based on the Neutrosophic Agility Index revealed that Self-confidence held the highest agility score, indicating that students felt reasonably confident in their ability to make decisions and approach in

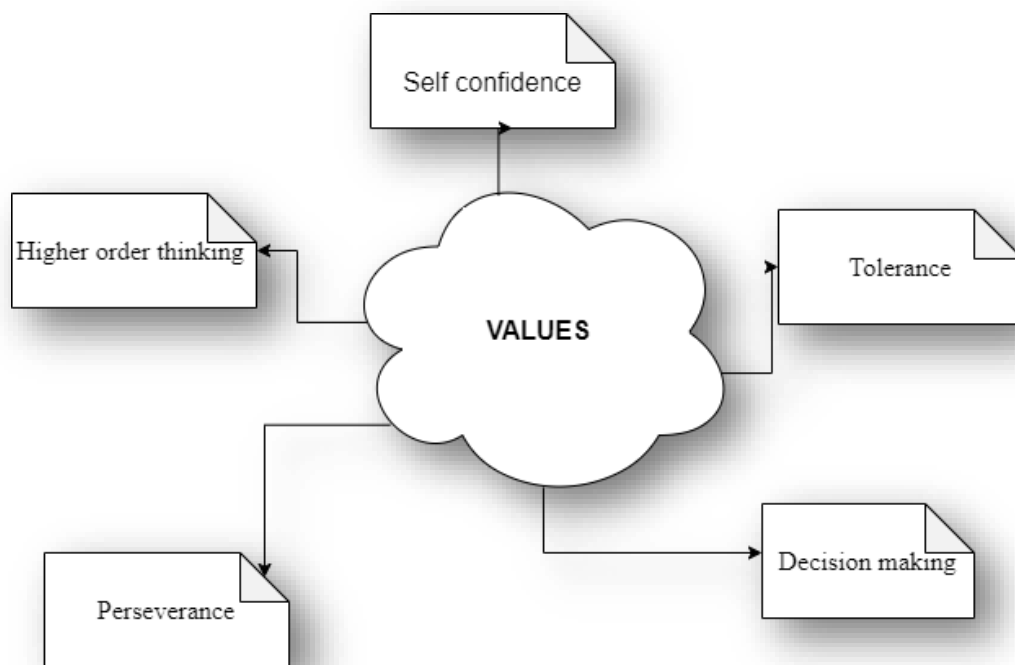


Figure:1 Values of learning mathematics among students

mathematical problems. Perseverance followed closely, reflecting the students' resilience and determination in learning mathematics. Decision-making was next, suggesting a balanced approach to analyzing and resolving mathematical challenges. Tolerance and Higher Order Thinking also scored significantly, showing students' ability to manage diverse viewpoints and engage in complex cognitive tasks. This ranking provides valuable insights into which values are most agile among students, highlighting areas of strength and potential improvement in the educational process.

4.1 Computation of Neutrosophic Agility Index:

Step:1

Based on the results of the survey, a questionnaire was developed to rank the values associated with learning mathematics. This questionnaire aimed to gather students' perspectives on key values such

as Self-confidence, Tolerance, Decision-making, Perseverance, and Higher Order Thinking. The survey was distributed to a sample of students, and a total of 110 responses were collected. The responses provided valuable insights into how students perceive and prioritize these values in the context of learning mathematics. The data collected from the questionnaire is summarized in Table 2, which details the rankings and scores for each of the values assessed. This information forms the basis for further analysis and helps identify areas where educational interventions may be needed to enhance students' mathematical learning experience.

Table:2 Responses of two decision makers

VALUES	DM1					DM2				
	A	DA	N	SA	SD	A	DA	N	SA	SD
Self confidence	4	0	1	26	1	16	0	2	58	2
Tolerance	9	0	1	21	1	32	4	7	33	2
Decision making	5	0	2	24	1	21	1	5	49	2
Perseverance	8	0	1	22	1	21	1	4	52	0
Higher order thinking	5	1	2	23	1	22	1	6	47	2

Step:2

Neutrosophy is a philosophical theory that deals with indeterminacy, contradictions, and uncertainties in human understanding and reasoning. In the context of converting responses into Neutrosophic responses, Table 3 illustrates various aspects of how this theory applies. It likely categorizes responses based on degrees of truth, falsity, and indeterminacy, reflecting the nuanced nature of human thought and expression. This approach acknowledges that responses can contain elements of truth, falsehood, and uncertainty simultaneously, emphasizing the complexity inherent in interpreting human communication through a Neutrosophic lens. Responses are converted into Neutrosophic responses.

Table:3 Neutrosophic Responses of two decision makers

Values	DM1			DM2		
	T	I	F	T	I	F
Self confidence	30	1	1	74	2	2
Tolerance	30	1	1	65	7	6
Decision making	29	2	1	70	5	3
Perseverance	30	1	1	73	4	1
Higher order thinking	28	2	2	69	6	3

Step:3

Neutrosophic values, as depicted in Table 4, represent a methodical conversion of Neutrosophic responses into quantifiable parameters or metrics. This table likely delineates how responses characterized by indeterminacy or ambiguity are translated into numerical or categorical values that encapsulate their nuanced nature. Such values could encompass degrees of truth, falsity, and indeterminacy, offering a structured framework to analyze and interpret Neutrosophic responses. This approach aids in understanding complex or contradictory information by assigning it measurable attributes, thereby facilitating deeper insights into the intricacies of human communication and perception within a Neutrosophic framework. Neutrosophic Responses are converted into Neutrosophic values.

Table:4 Neutrosophic values of Responses

Values	DM1			DM2		
	T	I	F	T	I	F
Self confidence	0.94	0.03	0.03	0.95	0.03	0.03
Tolerance	0.94	0.03	0.03	0.83	0.09	0.08
Decision making	0.91	0.06	0.03	0.90	0.06	0.04
Perseverance	0.94	0.03	0.03	0.94	0.05	0.01
Higher order thinking	0.88	0.06	0.06	0.88	0.08	0.04

Step:4

Table 5 likely presents the Neutrosophic Agility Index Score and Rank calculations, utilizing formulas (2), (3), (4), and (5) with a specified weightage of 0.33. This table provides a structured methodology for assessing and ranking agility within a neutrosophic context. By incorporating weighted factors from various formulas, it aims to quantify the agility of systems or entities while considering the inherent uncertainties and complexities. This approach facilitates a comprehensive evaluation that takes into account multiple dimensions of agility, reflecting its adaptability and responsiveness across diverse scenarios or environments. Thus, Table 5 serves as a valuable tool for decision-makers seeking to understand and improve agility within neutrosophic frameworks.

Table:5 Neutrosophic Agility Index Score and Rank

Values	DM1			DM2			Score		Average Score	Rank
	T	I	F	T	I	F	DM1	DM2		
Self confidence	0.31	0.35	0.35	0.31	0.35	0.35	0.5358	0.5396	0.5377	1
Tolerance	0.31	0.35	0.35	0.28	0.39	0.38	0.5358	0.5011	0.5185	4
Decision making	0.30	0.37	0.35	0.30	0.37	0.36	0.5254	0.5225	0.5239	3
Perseverance	0.31	0.35	0.35	0.31	0.36	0.34	0.5358	0.5353	0.5356	2
Higher order thinking	0.29	0.37	0.37	0.29	0.38	0.36	0.5150	0.5182	0.5166	5

0.5265

Step:5

Table 6 likely presents the results of calculating the Neutrosophic Agility Index Score and Neutrosophic Agility Index certainty using formulas (5) and (6). Formula (5) typically computes the Neutrosophic Agility Index Score, which quantifies the overall agility of a system or entity based on weighted factors that contribute to its adaptability and responsiveness. This score reflects a nuanced assessment that accounts for uncertainties and varying degrees of agility across different dimensions

or criteria. Formula (6), on the other hand, determines the Neutrosophic Agility Index certainty. This metric assesses the confidence or certainty associated with the agility index score, considering the reliability and consistency of the underlying data and calculations. A higher certainty value indicates greater confidence in the agility assessment, while a lower value suggests more uncertainty or variability in the agility measurements. Together, Table 6 provides a comprehensive view of both the Neutrosophic Agility Index Score and its associated certainty, offering decision-makers valuable insights into the agility of systems or entities within neutrosophic frameworks. This structured approach enables a deeper understanding of agility dynamics, facilitating informed decisions and strategic actions to enhance adaptability and responsiveness in complex and uncertain environments.

Table 6: Comparison of Agility Score and Certainty Score

Values	Agility Score	AS Rank	Certainty Score	CS Rank
Self confidence	0.5377	1	0.3131	1
Tolerance	0.5185	4	0.2750	5
Decision making	0.5239	3	0.2962	3
Perseverance	0.5356	2	0.3088	2
Higher order thinking	0.5166	5	0.2919	4
Average Score	0.5265		0.2970	

5. Result Analysis

In the proposed research, an overview is presented based on the compilation of five foundational values that are crucial for learning mathematical skills. These values likely encompass key aspects such as problem-solving abilities, critical thinking, numerical fluency, logical reasoning, and adaptability to mathematical concepts. Through comprehensive analysis and synthesis, the research draws several noteworthy conclusions. Firstly, it emphasizes the interconnectedness of these foundational values in fostering effective mathematical learning and proficiency. Secondly, it underscores the importance of nurturing these skills from early education through advanced levels to cultivate a robust mathematical aptitude. Additionally, the research highlights the role of these foundational values in preparing individuals to navigate complex mathematical challenges and real-

world applications with confidence and competence. Overall, the conclusions drawn from this research underscore the significance of these foundational values in shaping and enhancing mathematical skill development across diverse educational contexts and settings.

5.1 Analysis of the Neurosophic Agility Index using Score functions:

The examination of agility scores reveals the relative significance of various competences in shaping an individual's overall agility. Among these, self-confidence emerges as the most influential factor, as indicated by its highest agility score of 0.5377. This highlights that belief in one's abilities plays a pivotal role in enabling individuals to effectively navigate and respond to changing circumstances with confidence and assertiveness. Following closely, perseverance ranks second with an agility score of 0.5356, underscoring the crucial role of determination and resilience in fostering adaptability. The ability to persist and overcome challenges is essential for maintaining agility in dynamic environments. Additionally, decision-making skills demonstrate considerable importance with an agility score of 0.5239.

This competency enables individuals to make informed and timely decisions amidst uncertainty, crucial for navigating complexities and seizing opportunities effectively. Together, these findings underscore the multidimensional nature of agility, where self-confidence, perseverance, and decision-making skills collectively contribute to an individual's ability to thrive in unpredictable and fast-changing contexts. By understanding and prioritizing these competences, individuals and organizations can enhance their agility, enabling them to innovate, respond swiftly to challenges, and achieve sustained success in diverse domains.

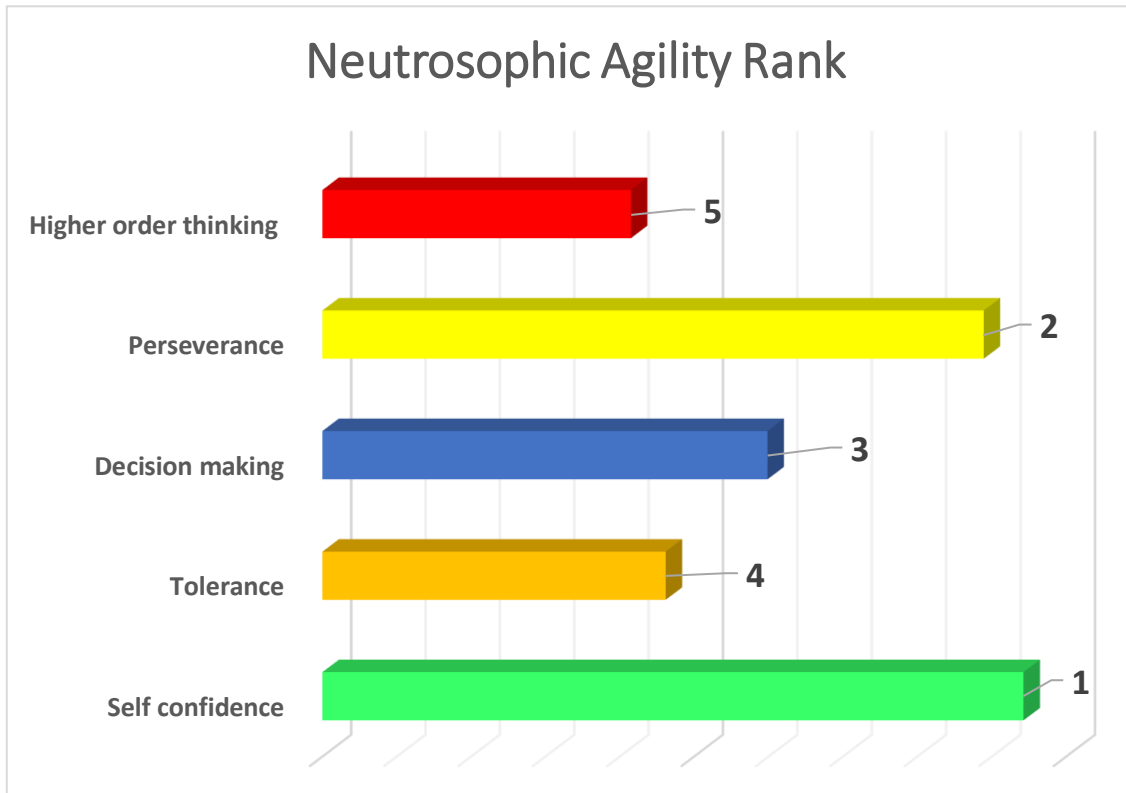


Figure:2 Neurosophic Agility Rank based on Score functions

Tolerance, with an agility score of 0.5185, emerges as the fourth-ranked competency in influencing an individual's overall agility. This finding underscores the importance of embracing diversity and adapting to differences in people, ideas, and situations. The ability to remain open-minded and flexible contributes significantly to navigating diverse and dynamic environments with ease and effectiveness. Conversely, higher-order thinking skills, with an agility score of 0.5166, are identified as the lowest-ranked competency among those analyzed. While critical and creative thinking abilities are vital for problem-solving and innovation, their relatively lower impact on agility compared to other factors like self-confidence, perseverance, and decision-making suggests that emotional and behavioral competencies may play a more pivotal role in enabling swift and adaptive responses to change.

Overall, these insights highlight the multifaceted nature of agility, where a blend of emotional resilience, behavioral flexibility, and adaptive mindset are crucial alongside cognitive abilities. Organizations and individuals can benefit from developing holistic strategies that foster these key competencies, thereby enhancing their capacity to thrive amidst uncertainty and complexity. By prioritizing the cultivation of self-confidence, perseverance, decision-making skills, tolerance, and higher-order thinking, stakeholders can bolster their agility and position themselves for sustained success in today's rapidly evolving world.

5.2 Comparison of Neutrosophic Agility Index analysis based on Score functions and Certainty:

The analysis of agility and certainty scores offers profound insights into the factors that significantly influence an individual's overall agility and their confidence in that agility. Self-confidence emerges as the top driver with a high agility score of 0.5377 and a corresponding high certainty score of 0.3131. This suggests that believing in one's capabilities plays a crucial role in how effectively individuals can adapt and respond to unpredictable situations. Self-assured individuals are typically more proactive and resilient, traits that contribute immensely to their agility in navigating challenges. Following closely, perseverance ranks second in both agility (0.5356) and certainty (0.3088) scores, highlighting the pivotal role of resilience and determination in maintaining agility over time. Individuals who exhibit perseverance are better equipped to handle setbacks and maintain focus on achieving their goals, thereby enhancing their overall agility.

Conversely, higher-order thinking skills, though important, show relatively lower agility (0.5166) and certainty (0.2919) scores compared to self-confidence and perseverance. This suggests that while critical and creative thinking abilities are valuable for problem-solving and innovation, they may not be as immediately impactful in driving overall agility and certainty as traits like self-assurance and resilience. The analysis also reveals insights into tolerance, which demonstrates a moderate agility score (0.5185) but a lower certainty score (0.2750). This discrepancy indicates that while individuals may possess the ability to adapt to diverse situations, they may not always feel fully confident in their adaptability. This underscores the potential for targeted development efforts to bolster both the agility and perceived certainty in handling diverse challenges.

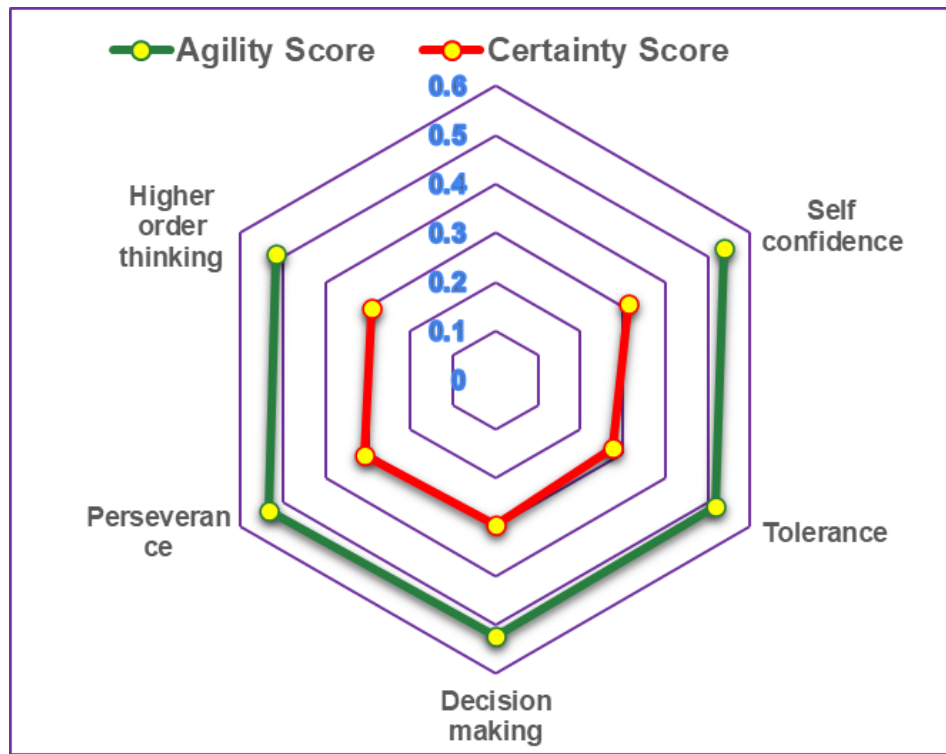


Figure:3 Comparison of Neutrosophic Agility Index based on Score functions and Certainty

Overall, this comprehensive examination underscores the multidimensional nature of agility, emphasizing the interplay between emotional resilience, behavioural adaptability, and cognitive flexibility. Organizations and individuals can leverage these insights to prioritize the cultivation of self-confidence, perseverance, and effective decision-making skills while also nurturing higher-order thinking and tolerance to foster a well-rounded approach to agility. By doing so, they can enhance their capacity to thrive in dynamic and uncertain environments, ultimately driving sustainable success and innovation.

6. Conclusion:

In conclusion, the Neutrosophic Agility Index provides a comprehensive assessment of agility across various dimensions, highlighting areas where individuals or organizations excel and areas that could benefit from improvement. The analysis reveals that self-confidence and perseverance are pivotal in fostering agility, as indicated by their high agility scores of 0.5377 and 0.5356, respectively. These attributes enable individuals to navigate uncertainties and challenges with confidence and resilience, crucial for adaptive decision-making and problem-solving. Decision-making and tolerance also play significant roles with agility scores of 0.5239 and 0.5185, reflecting their impact on organizational adaptability and capacity to manage diversity. Meanwhile, higher-order thinking skills, though essential for innovation and critical analysis, show a relatively lower agility score of 0.5166, suggesting potential areas for enhancing cognitive flexibility and problem-solving capabilities.

Overall, the average agility score of 0.5265 falls within the 'Fairly Agile' range according to the scale used, indicating a solid foundation with room for enhancement. By focusing on improving these foundational values, organizations can aim to achieve higher agility categories such as 'Agile' or 'Extremely Agile,' fostering a culture that embraces change, innovation, and continuous improvement. Looking ahead, future studies could explore the relationship between organizational culture and agility using diverse measurement standards, including fuzzy logic approaches. Such studies could delve deeper into how cultural factors influence agility and vice versa, examining their direct impact on organizational innovation, performance, and resilience in dynamic environments. By leveraging these insights, organizations can strategically align their culture with agile practices, thereby optimizing their ability to thrive and innovate in an increasingly competitive landscape.

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