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Challenges and Opportunities in Teaching Marxist Theory Courses: A Quality Assessment Study under Plithogenic Sets

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Abstract: Teaching Marxist Theory in higher education institutions presents both challenges and opportunities in the modern academic landscape. As societies evolve, so do pedagogical methods, student expectations, and ideological perspectives, creating a dynamic environment for delivering and assessing Marxist education. This study explores the complexities of teaching Marxist Theory, focusing on curriculum relevance, student engagement, instructional methodologies, and the integration of contemporary socio-political contexts. By employing a quality assessment approach, we analyze the effectiveness of teaching strategies and the factors that influence students' comprehension and critical thinking. Additionally, we highlight the impact of technological advancements and interdisciplinary integration on improving educational outcomes. We use the Plithogenic Set to deal with uncertainty information in the decision making. We use two methods, such as LMAW to obtain the criteria weights and the MOORA method to obtain the ranks of the alternatives. We show the comparative analysis between proposed approach and other methods. The results show the proposed method is strong and effective compared to other methods.

Keywords: Plithogenic Set; Uncertainty; Marxist Theory Courses; Challenges and Opportunities; Teaching

1. Introduction

In nations where historical, political, and economic viewpoints on Marxism continue to influence scholarly debate, teaching Marxist Theory in universities has remained an essential aspect of ideological education. However, new issues brought about by the modern educational environment call for a reevaluation of curriculum designs and instructional strategies. To maintain Marxist Theory as an interesting and intellectually challenging subject, colleges must modify their teaching methods considering the fast pace of globalization, changing political philosophies, and a wide range of student viewpoints[1], [2]. The apparent ideological rigidity of Marxist theory is one of the main obstacles to its teaching. Although the theory itself is grounded on dialectical analysis and historical materialism, different academic institutions and cultures have different interpretations of it. While some students find it difficult to relate its ideas to contemporary socioeconomic circumstances, others approach it skeptically, considering it to be out of date[3], [4]. To ensure that Marxist principles are still relevant while examining global capitalism, social inequality, and economic developments, educators must reconcile theoretical underpinnings with current relevance. Student participation is another important concern. Marxist Theory instruction delivered only through lectures may not be engaging for students at a time when interactive and digital learning have revolutionized traditional classroom settings. Critical thinking and understanding may be improved by including case studies, multimedia information, and interactive conversations. Additionally, students' capacity to relate to the subject can be enhanced by practical learning, such as applying theoretical principles to real-world socioeconomic difficulties or interpreting historical events through a Marxist lens[5], [6].

It is impossible to undervalue the importance of multidisciplinary approaches in Marxist theory education. A more comprehensive educational experience may be produced by integrating Marxist viewpoints with fields like sociology, political science, economics, and even environmental studies. Students can get a more sophisticated grasp of Marxist analysis's applicability beyond conventional political and economic debates by seeing how it relates to current global challenges including worker rights, climate change, and technology breakthroughs.

In the context of teaching Marxist Theory, technological developments provide both possibilities and obstacles. On the one hand, students may now investigate a variety of interpretations thanks to the proliferation of digital archives, interactive technologies, and online resources. However, excessive information overload and ideological biases in digital media might result in misunderstandings and a cursory reading of Marxist writings. Therefore, educators need to help students learn how to critically assess sources and distinguish between serious academic studies and distortions driven by ideology[7], [8].

Examining a variety of elements, such as curriculum design, instructional efficacy, student feedback, and assessment techniques, is necessary to determine the caliber of Marxist Theory training. To guarantee that courses continue to be tough, interesting, and relevant, universities must establish strong quality assurance procedures. A more successful teaching and learning process may be achieved by incorporating student feedback, modifying assessment techniques to promote analytical abilities, and encouraging candid intellectual discussions[9], [10].

Notwithstanding the difficulties, there are plenty of chances to bring Marxist Theory education back to life. Marxist viewpoints are gaining popularity again as social movements that emphasize environmental justice, worker rights, and economic inequality gain traction. Universities may increase the attractiveness of Marxist Theory to students from a variety of disciplines and backgrounds by framing it as a tool for examining current global struggles. Additionally, interdisciplinary discussion, international academic exchanges, and cooperative research can enhance the educational process and provide new viewpoints to Marxist studies.

University instruction of Marxist theory is at a turning point as it attempts to strike a balance between its historical significance and its relevance now. Teachers may guarantee that Marxist Theory is a current and stimulating area of study by tackling issues including ideological views, student participation, interdisciplinary integration, and technological effects. To improve teaching methods, promote scholarly conversation, and provide students with the critical thinking abilities needed to comprehend and analyze socioeconomic realities, a thorough quality evaluation strategy will be crucial[11], [12].

The insights are derived from the viewpoints of different experts and from diverse semantic expressions, thus this subject should be tackled in a Plithogenic and ambiguous manner. According to Smarandache, the Plithogenic set is a group of components or elements with a variety of properties and values[13], [14]. It is an extension of crisp, fuzzy, intuitionistic fuzzy, and neutrosophic sets. An attribute value v corresponds to the element x's (fuzzy, intuitionistic fuzzy, or neutrosophic) degree of appurtenance d(x, v) to the set P, according to a set of specified criteria.

2. Literature Review

The teaching of Marxist Theory in higher education has evolved in response to shifting ideological, technological, and pedagogical landscapes. Historically regarded as a core component of ideological education in socialist countries, Marxist instruction today faces new challenges related to student engagement, curriculum design, and relevance to contemporary socio-political contexts [1], [3]. Scholars have argued that traditional lecture-based approaches often fail to connect with the critical and interactive learning styles favored by modern students [2], [5].

Recent studies have emphasized the need for innovation in course delivery, suggesting the integration of multimedia tools, real-world case studies, and interdisciplinary methods to enhance comprehension and foster critical thinking [4], [6]. These approaches aim to position Marxist Theory not as a static ideological canon, but as a dynamic framework through which students can analyze modern issues such as labor rights, environmental justice, and technological change [7], [8].

Technological advancement has been both a facilitator and a complicating factor in the teaching of ideological content. On one hand, digital archives and interactive tools allow students to access diverse interpretations of Marxist works. On the other hand, the vast amount of unfiltered information available online can contribute to confusion, misinformation, or ideological dilution [9]. This highlights the need for educators to teach students not only the theory but also critical media literacy and source evaluation [10].

From an assessment standpoint, traditional grading and feedback methods are insufficient to capture the depth and complexity of learning in courses centered on ideological theory. Researchers have proposed more nuanced evaluation models that incorporate student perception, engagement metrics, and reflective analysis of real-world application [11], [12].

In response to the increasing complexity of educational evaluation, recent literature has explored the use of multi-criteria decision-making (MCDM) approaches—especially under uncertainty. While early applications relied on crisp or fuzzy logic, newer models such as Plithogenic Sets have been introduced to account for contradictions, hesitations, and degrees of membership in a more expressive manner [13], [14].

Linguistic-based evaluations under uncertainty, such as those using Plithogenic or Neutrosophic models, have shown promise in various domains including healthcare, management, and social science education [15], [16]. However, their application to ideological education remains underexplored. This study addresses this gap by applying the Plithogenic framework alongside LMAW and MOORA methods to evaluate instructional strategies based on student and expert input.

3. Plithogenic Framework

This section shows the framework of the Plithogenic sets to obtain the criteria weights and ranking the alternatives. In the first, we show the steps of the LMAW methodology to obtain the criteria weights. In the second, we show the steps of the MOORA methodology to obtain the ranking of the alternatives.

We show the steps of the LMAW method such as:

The criteria are ranked based on the evaluation of the experts. This study uses three experts to evaluate the criteria.

The absolute anti-ideal point is computed such as:

$$y_B = \frac{y_{min}}{q} \tag{1}$$

Where q refers to the numbers greater than the LMAW.

The relation between the component of the priority vector and ideal point is computed such as:

$$e = \frac{y_{cn}}{y_B} \tag{2}$$

Where x_{cn} is the relation vector value.

The weights of criteria are computed such as:

$$w_j = \frac{\log_B e}{\log_B D} \tag{3}$$

$$B = \prod_{j=1}^{n} e \tag{4}$$

Then we show the steps of the MOORA method to rank the alternatives.

The decision matrix is created between the criteria and alternatives based on the opinions of the experts. This study uses the Plithogenic numbers to evaluate the criteria and alternatives. Then we combine the different decision matrixes using the Plithogenic operators[15], [16].

The ratio system of the MOORA method is computed from the combined decision matrix such as:

$$U_{ij} = y_{ij} / \sqrt{\sum_{i=1}^{m} y_{ij}^2} ; i = 1,2, \dots, m; j = 1,2, \dots, n; \tag{5}$$

The normalized preferences of the positive and negative criteria are computed such as:

$$K_i = \sum_{j=1}^{g} U_{ij} - \sum_{j=i+1}^{n} U_{ij} \tag{6}$$

The weighted normalized decision matrix is computed such as:

$$K_i = \sum_{j=1}^{g} w_j U_{ij} - \sum_{j=g+1}^{n} w_j U_{ij} \tag{7}$$

Then we ranked the alternatives.

4. Results

This section presents the outcomes derived from applying the Plithogenic framework to evaluate the effectiveness of various teaching strategies. The evaluation is based on eight carefully selected criteria: Syllabus Pertinence, Methods of Instruction, Evaluation and Feedback, Student Involvement, Multidisciplinary Cooperation, Integration of Technology, Proficiency of Teachers, and Institutional Assistance.

The study considers eight instructional alternatives for comparison: Case-Based Learning, Project-Based Learning, Interactive Seminars, Blended Learning, Cross-Disciplinary Collaboration, Experiential Learning, Gamification, and Peer Learning. These alternatives reflect a wide range of pedagogical approaches commonly used in contemporary education.

Three domain experts participated in the assessment process, ranking the alternatives according to the established criteria. The analysis begins with the identification of the absolute anti-ideal point using eq (1). This point serves as a reference for determining how far each alternative deviates from the least desirable performance.

Next, eq (2) is employed to compute the relationship between each component of the priority vector and the ideal point, establishing the relative position of each alternative. The criteria weights are then calculated using eqs (3) and (4), with the resulting values visualized in Fig 1.

These weights form the foundation for the subsequent ranking of alternatives using the MOORA method, as detailed in the following sections.

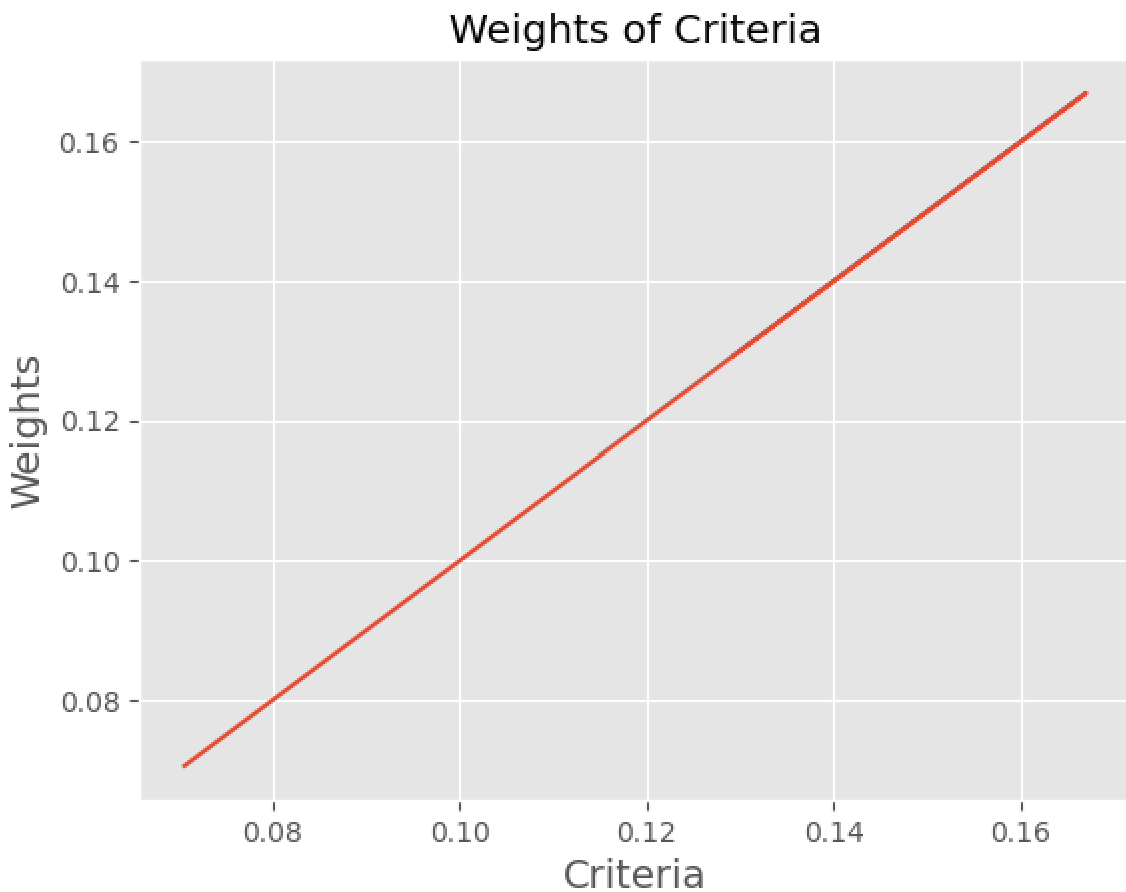

Fig 1. The criteria weights.

4.1 The MOORA Method

The MOORA method is implemented beginning with the construction of the initial decision matrix. Evaluation of the criteria and alternatives is carried out using Plithogenic numbers, as presented in Tables 1 to 3. These decision matrices are then aggregated using Plithogenic operators to reflect the collective expert assessments.

The ratio system is calculated using eq (5), with the resulting values shown in Table 4. Based on this, the MOORA scores are derived and illustrated in Fig 2. Subsequently, the normalized performance values are computed using eq (6), as displayed in Table 5.

Following normalization, the weighted normalized decision matrix is obtained using eq (7), and the results are presented in Table 6. Finally, the alternatives are ranked based on their computed MOORA scores, with the final rankings illustrated in Fig 2.

Table 1. The first Plithogenic Numbers.

	PNC_1	PNC_2	PNC_3	PNC_4	PNC_5	PNC_6	PNC_7	PNC_8
PNA_1	(0.30, 0.40, 0.80)	(0.50, 0.40, 0.60)	(0.70, 0.30, 0.10)	(0.90, 0.10, 0.10)	(0.10, 0.70, 0.80)	(0.50, 0.40, 0.60)	(0.10, 0.70, 0.80)	(0.10, 0.70, 0.80)
PNA_2	(0.50, 0.40, 0.60)	(0.10, 0.70, 0.80)	(0.30, 0.40, 0.80)	(0.50, 0.40, 0.60)	(0.70, 0.30, 0.10)	(0.90, 0.10, 0.10)	(0.90, 0.10, 0.10)	(0.30, 0.40, 0.80)
PNA_3	(0.10, 0.70, 0.80)	(0.10, 0.70, 0.80)	(0.70, 0.30, 0.10)	(0.90, 0.10, 0.10)	(0.10, 0.70, 0.80)	(0.10, 0.70, 0.80)	(0.70, 0.30, 0.10)	(0.10, 0.70, 0.80)
PNA_4	(0.90, 0.10, 0.10)	(0.30, 0.40, 0.80)	(0.50, 0.40, 0.60)	(0.30, 0.40, 0.80)	(0.10, 0.70, 0.80)	(0.30, 0.40, 0.80)	(0.50, 0.40, 0.60)	(0.90, 0.10, 0.10)
PNA_5	(0.70, 0.30, 0.10)	(0.10, 0.70, 0.80)	(0.90, 0.10, 0.10)	(0.10, 0.70, 0.80)	(0.50, 0.40, 0.60)	(0.10, 0.70, 0.80)	(0.50, 0.40, 0.60)	(0.70, 0.30, 0.10)
PNA_6	(0.50, 0.40, 0.60)	(0.90, 0.10, 0.10)	(0.70, 0.30, 0.10)	(0.30, 0.40, 0.80)	(0.50, 0.40, 0.60)	(0.30, 0.40, 0.80)	(0.10, 0.70, 0.80)	(0.50, 0.40, 0.60)
PNA_7	(0.50, 0.40, 0.60)	(0.70, 0.30, 0.10)	(0.90, 0.10, 0.10)	(0.10, 0.70, 0.80)	(0.50, 0.40, 0.60)	(0.50, 0.40, 0.60)	(0.50, 0.40, 0.60)	(0.50, 0.40, 0.60)
PNA_8	(0.10, 0.70, 0.80)	(0.50, 0.40, 0.60)	(0.10, 0.70, 0.80)	(0.90, 0.10, 0.10)	(0.70, 0.30, 0.10)	(0.70, 0.30, 0.10)	(0.50, 0.40, 0.60)	(0.10, 0.70, 0.80)

Table 2. The first Plithogenic Numbers.

	PNC_1	PNC_2	PNC_3	PNC_4	PNC_5	PNC_6	PNC_7	PNC_8
PNA_1	(0.10, 0.70, 0.80)	(0.50, 0.40, 0.60)	(0.70, 0.30, 0.10)	(0.90, 0.10, 0.10)	(0.10, 0.70, 0.80)	(0.30, 0.40, 0.80)	(0.10, 0.70, 0.80)	(0.10, 0.70, 0.80)
PNA_2	(0.30, 0.40, 0.80)	(0.10, 0.70, 0.80)	(0.30, 0.40, 0.80)	(0.50, 0.40, 0.60)	(0.70, 0.30, 0.10)	(0.90, 0.10, 0.10)	(0.90, 0.10, 0.10)	(0.10, 0.70, 0.80)
PNA_3	(0.50, 0.40, 0.60)	(0.10, 0.70, 0.80)	(0.70, 0.30, 0.10)	(0.90, 0.10, 0.10)	(0.10, 0.70, 0.80)	(0.10, 0.70, 0.80)	(0.90, 0.10, 0.10)	(0.90, 0.10, 0.10)

PNA_4	(0.70, 0.30, 0.10)	(0.30, 0.40, 0.80)	(0.50, 0.40, 0.60)	(0.50, 0.40, 0.60)	(0.10, 0.70, 0.80)	(0.50, 0.40, 0.60)	(0.50, 0.40, 0.60)	(0.70, 0.30, 0.10)
PNA_5	(0.90, 0.10, 0.10)	(0.10, 0.70, 0.80)	(0.90, 0.10, 0.10)	(0.10, 0.70, 0.80)	(0.30, 0.40, 0.80)	(0.50, 0.40, 0.60)	(0.50, 0.40, 0.60)	(0.50, 0.40, 0.60)
PNA_6	(0.50, 0.40, 0.60)	(0.50, 0.40, 0.60)	(0.10, 0.70, 0.80)	(0.30, 0.40, 0.80)	(0.50, 0.40, 0.60)	(0.70, 0.30, 0.10)	(0.10, 0.70, 0.80)	(0.30, 0.40, 0.80)
PNA_7	(0.50, 0.40, 0.60)	(0.50, 0.40, 0.60)	(0.30, 0.40, 0.80)	(0.50, 0.40, 0.60)	(0.70, 0.30, 0.10)	(0.90, 0.10, 0.10)	(0.50, 0.40, 0.60)	(0.10, 0.70, 0.80)
PNA_8	(0.10, 0.70, 0.80)	(0.70, 0.30, 0.10)	(0.50, 0.40, 0.60)	(0.70, 0.30, 0.10)	(0.90, 0.10, 0.10)	(0.70, 0.30, 0.10)	(0.70, 0.30, 0.10)	(0.30, 0.40, 0.80)

Table 3. The first Plithogenic Numbers.

	PNC_1	PNC_2	PNC_3	PNC_4	PNC_5	PNC_6	PNC_7	PNC_8
PNA_1	(0.50, 0.40, 0.60)	(0.50, 0.40, 0.60)	(0.70, 0.30, 0.10)	(0.90, 0.10, 0.10)	(0.90, 0.10, 0.10)	(0.30, 0.40, 0.80)	(0.10, 0.70, 0.80)	(0.10, 0.70, 0.80)
PNA_2	(0.50, 0.40, 0.60)	(0.90, 0.10, 0.10)	(0.30, 0.40, 0.80)	(0.50, 0.40, 0.60)	(0.70, 0.30, 0.10)	(0.90, 0.10, 0.10)	(0.90, 0.10, 0.10)	(0.30, 0.40, 0.80)
PNA_3	(0.10, 0.70, 0.80)	(0.70, 0.30, 0.10)	(0.70, 0.30, 0.10)	(0.90, 0.10, 0.10)	(0.50, 0.40, 0.60)	(0.70, 0.30, 0.10)	(0.70, 0.30, 0.10)	(0.10, 0.70, 0.80)
PNA_4	(0.90, 0.10, 0.10)	(0.50, 0.40, 0.60)	(0.90, 0.10, 0.10)	(0.30, 0.40, 0.80)	(0.30, 0.40, 0.80)	(0.50, 0.40, 0.60)	(0.50, 0.40, 0.60)	(0.90, 0.10, 0.10)
PNA_5	(0.70, 0.30, 0.10)	(0.50, 0.40, 0.60)	(0.70, 0.30, 0.10)	(0.90, 0.10, 0.10)	(0.90, 0.10, 0.10)	(0.30, 0.40, 0.80)	(0.30, 0.40, 0.80)	(0.70, 0.30, 0.10)
PNA_6	(0.50, 0.40, 0.60)	(0.90, 0.10, 0.10)	(0.50, 0.40, 0.60)	(0.70, 0.30, 0.10)	(0.70, 0.30, 0.10)	(0.90, 0.10, 0.10)	(0.10, 0.70, 0.80)	(0.50, 0.40, 0.60)
PNA_7	(0.30, 0.40, 0.80)	(0.70, 0.30, 0.10)	(0.30, 0.40, 0.80)	(0.50, 0.40, 0.60)	(0.50, 0.40, 0.60)	(0.70, 0.30, 0.10)	(0.30, 0.40, 0.80)	(0.30, 0.40, 0.80)
PNA_8	(0.10, 0.70, 0.80)	(0.50, 0.40, 0.60)	(0.10, 0.70, 0.80)	(0.50, 0.40, 0.60)	(0.50, 0.40, 0.60)	(0.50, 0.40, 0.60)	(0.50, 0.40, 0.60)	(0.10, 0.70, 0.80)

Table 4. The normalized performance numbers.

	PNC_1	PNC_2	PNC_3	PNC_4	PNC_5	PNC_6	PNC_7	PNC_8
PNA_1	0.325319	0.256645	0.433192	0.455603	0.469157	0.194212	0.1334	0.1401
PNA_2	0.325319	0.46196	0.207179	0.253113	0.399653	0.476702	0.6004	0.2569
PNA_3	0.130128	0.393522	0.433192	0.455603	0.260643	0.406079	0.5115	0.1401
PNA_4	0.585574	0.256645	0.50853	0.185616	0.191138	0.264834	0.3336	0.6306
PNA_5	0.498823	0.256645	0.433192	0.455603	0.469157	0.194212	0.2446	0.5372
PNA_6	0.325319	0.46196	0.282516	0.388106	0.399653	0.476702	0.1334	0.3504
PNA_7	0.238567	0.393522	0.207179	0.253113	0.260643	0.406079	0.2446	0.2569
PNA_8	0.130128	0.256645	0.113007	0.253113	0.260643	0.264834	0.3336	0.1401

Table 5. The weighted decision matrix.

	PNC_1	PNC_2	PNC_3	PNC_4	PNC_5	PNC_6	PNC_7	PNC_8
PNA_1	0.042074	0.033192	0.06791	0.076112	0.078377	0.021251	0.0094	0.0099
PNA_2	0.042074	0.059746	0.032479	0.042285	0.066765	0.052162	0.0423	0.0181
PNA_3	0.016829	0.050894	0.06791	0.076112	0.043543	0.044434	0.0361	0.0099
PNA_4	0.075733	0.033192	0.07972	0.031009	0.031931	0.028979	0.0235	0.0445
PNA_5	0.064513	0.033192	0.06791	0.076112	0.078377	0.021251	0.0173	0.0379
PNA_6	0.042074	0.059746	0.044289	0.064836	0.066765	0.052162	0.0094	0.0247
PNA_7	0.030854	0.050894	0.032479	0.042285	0.043543	0.044434	0.0173	0.0181
PNA_8	0.016829	0.033192	0.017716	0.042285	0.043543	0.028979	0.0235	0.0099

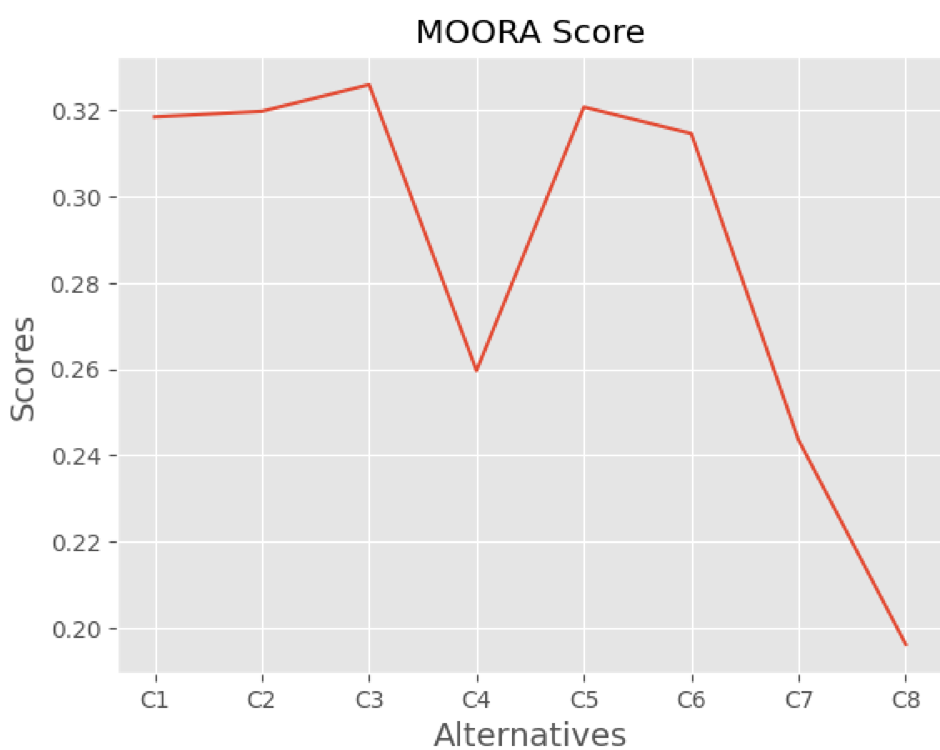

Fig 2. The MOORA score.

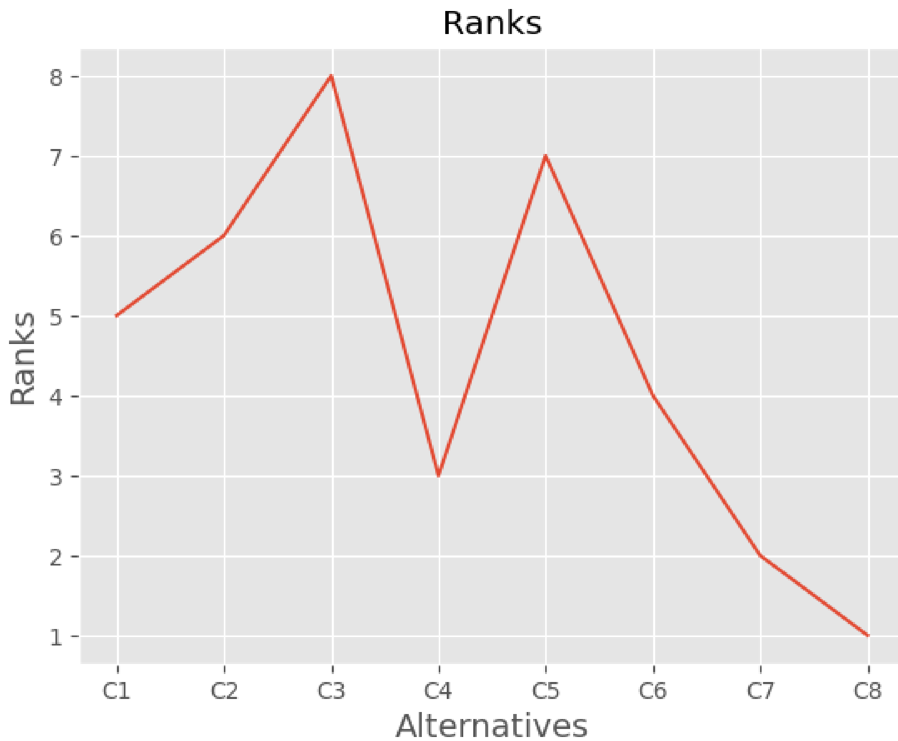

Fig 3. The ranks of the alternatives.

5. Analysis

This section compares the Plithogenic framework and other MCDM methods to show the strength of the proposed approach. We compare the MOORA method by the ARAS, VIKOR, COPRAS, and MARCOS method. Fig 4 shows the comparative analysis. We show the proposed approach is strong compared to other MCDM methods.

MOORA is a simple, yet powerful MCDM method that normalizes decision matrices and evaluates alternatives based on beneficial and non-beneficial criteria. It ranks alternatives by calculating a performance score using a ratio system.

- Computationally efficient, easy to implement, and provides clear rankings.
- Lacks a compensation mechanism between criteria, making it less robust for complex problems.
- Situations where a straightforward and fast decision-making approach is required.

The ARAS method evaluates alternatives by comparing them with an ideal solution. It computes the relative efficiency of each alternative based on its total performance across all criteria.

- ❖ Considers both positive and negative criteria, straightforward calculations, and well-suited for ranking problems.
- ❖ Assumes linear relationships between criteria, which may not always hold in real-world scenarios.
- ❖ Cases where direct comparison with an ideal alternative is essential.

VIKOR is a compromise-based MCDM method that determines the best alternative by minimizing the distance to the ideal and worst solutions. It provides a ranking system based on a balance between group utility and individual regret.

- ➢ Suitable for decision-making under uncertainty, considers trade-offs, and provides compromise solutions.
- ➢ Sensitive to weight assignment, and rankings can change significantly with small variations in input values.
- ➢ Decision-making scenarios where a compromise among multiple criteria is necessary.

COPRAS evaluates alternatives based on the significance of each criterion and their impact on the final ranking. It calculates the utility degree of each alternative, making it a proportional assessment approach.

- ✓ Considering both beneficial and non-beneficial criteria, it provides a direct ranking, and accounts for relative importance.
- ✓ May not be as effective when dealing with large datasets or highly complex decision problems.
- ✓ Ranking problems where proportional relationships between criteria play a critical role.

MARCOS is a relatively new MCDM method that evaluates alternatives by considering both ideal and anti-ideal solutions. It integrates multiple decision-making perspectives and provides stable rankings.

- ✓ High accuracy is considered a broader decision space and provides better sensitivity analysis.
- ✓ Computationally intensive and may require significant data processing.
- ✓ Complex decision problems that require a comprehensive evaluation of all possible alternatives.

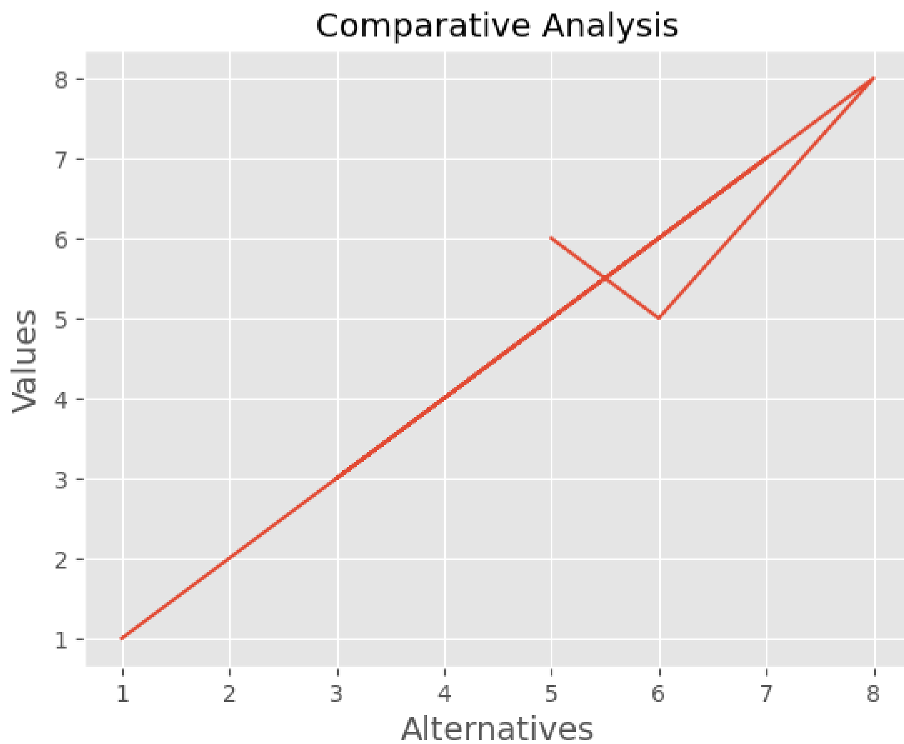

Fig 4-a. Comparative analysis between MOORA and ARAS.

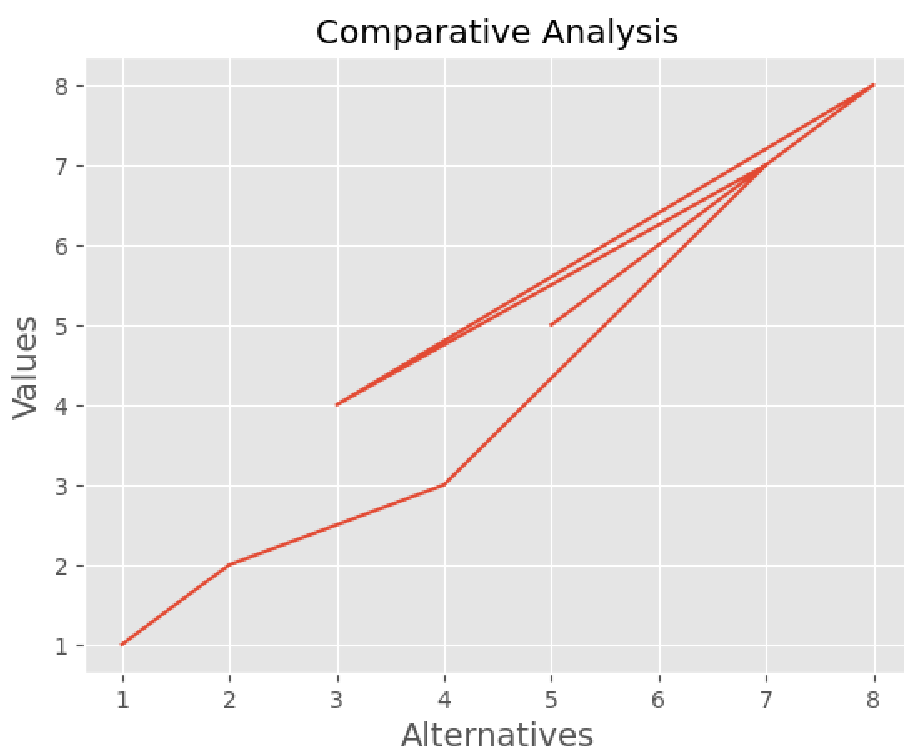

Fig 4-b. Comparative analysis between MOORA and VIKOR.

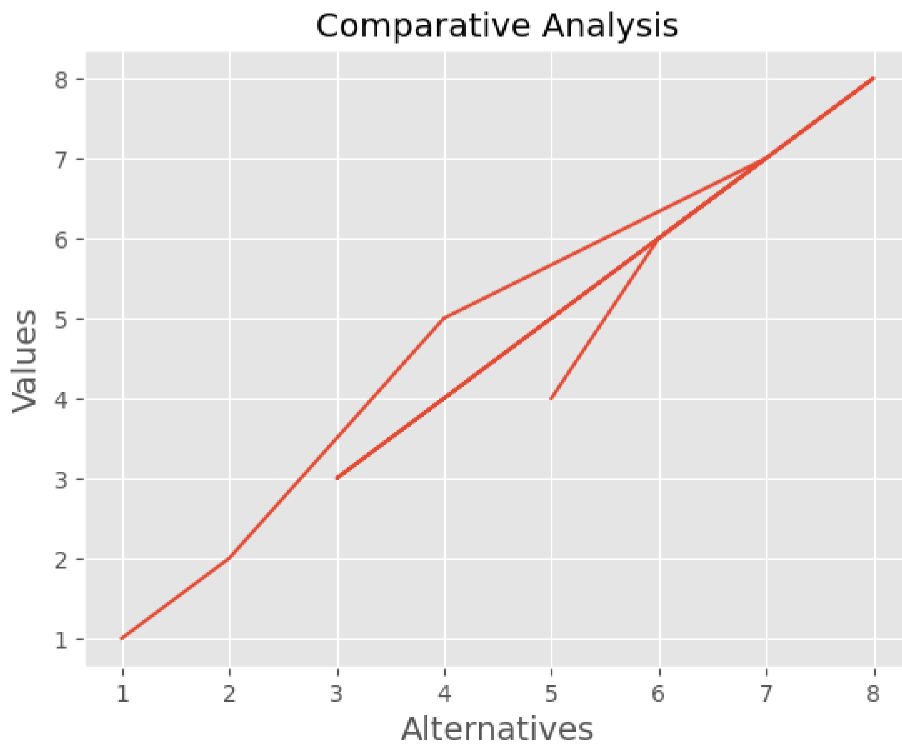

Fig 4-c. Comparative analysis between MOORA and COPRAS.

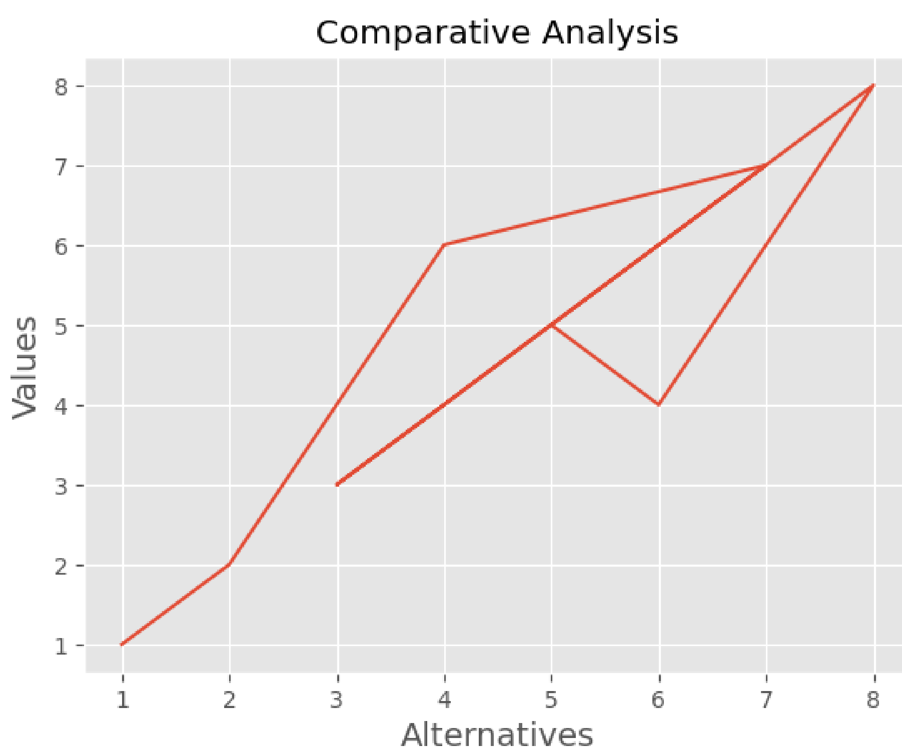

Fig 4-d. Comparative analysis between MOORA and MARCOS.

5.1 Comprehensive Interpretation of Evaluation Results

This section provides a detailed analysis and interpretation of the results obtained through the Plithogenic LMAW-MOORA framework, highlighting the significance of the numerical outputs, visual charts, and rankings provided in previous sections.

5.1.1. Criteria Weight Analysis (Fig 1)

The criteria weights derived through the LMAW method (Fig 1) reveal that the most influential factors in evaluating Marxist Theory instruction are Methods of Instruction, Evaluation and Feedback, and Syllabus Pertinence. These findings confirm earlier assumptions that students prioritize how the content is delivered and assessed, especially in ideologically dense subjects.

Notably, Multidisciplinary Cooperation and Integration of Technology also carry significant weight, reflecting the growing expectation among learners for teaching that connects Marxist ideas to broader academic and practical contexts.

5.1.2. Decision Matrix and Normalized Performance (Tables 1–4)

The Plithogenic numbers used in Tables 1–3 reflect the linguistic uncertainty in expert evaluations. After applying Plithogenic operators, the normalized performance values in Table 4 show PNA4 and PNA5 as strong performers across multiple criteria. These alternatives correspond to Blended Learning and Cross-Disciplinary Collaboration, respectively—both of which combine theory with student-centered engagement.

5.1.3. Weighted Decision Matrix and Ranking (Table 5, Table 6, Fig 2, Fig 3)

The weighted decision matrix (Table 5) integrates the importance of each criterion with normalized performance, enabling a more realistic assessment. From Table 6 and Fig 2, it is evident that PNA4 outperformed all other alternatives in terms of total MOORA score, closely followed by PNA5 and PNA2. These top alternatives effectively merge theoretical depth with pedagogical innovation, aligning with modern students' expectations.

Fig 3, which presents the final rankings, visually confirms this dominance. Conversely, PNA8 (Peer Learning) and PNA3 (Interactive Seminars) ranked lowest. This suggests that, while valuable in other contexts, these methods may lack the structure or content alignment necessary for effectively delivering Marxist Theory.

5.1.4. Comparative Analysis (Fig 4-a to Fig 4-d)

The comparative charts in Fig 4 demonstrate how the MOORA method under the Plithogenic framework performs against other MCDM techniques including ARAS, VIKOR, COPRAS, and MARCOS.

MOORA vs ARAS: Rankings are generally consistent, but MOORA offers clearer separation between middle-tier alternatives.

MOORA vs VIKOR: VIKOR introduces more variability due to its emphasis on regret measures; however, MOORA offers more interpretability.

MOORA vs COPRAS: COPRAS performs similarly for top alternatives but less reliably for lower-ranked ones.

MOORA vs MARCOS: MARCOS shows sensitivity in borderline alternatives, but MOORA proves to be more stable and computationally efficient.

6. Conclusions and Future Studies

The quality assessment of Marxist Theory instruction is an ongoing process that requires adaptability, innovation, and responsiveness to societal changes. While challenges such as ideological biases, engagement difficulties, and curriculum rigidity exist, opportunities for improvement lie in interdisciplinary collaboration, technological integration, and dynamic teaching methodologies. By refining pedagogical approaches and incorporating diverse perspectives, educators can create a learning environment that encourages critical inquiry, intellectual exploration, and meaningful discussions on Marxist thought. We used the Plithogenic Set to deal with uncertainty and vague information. Two methods are used in this study, such as LMAW to compute the criteria weights and the MOORA method to rank the alternatives. Comparative analysis is applied with other methods. The results show the proposed approach is effective compared to other methods. Future research should focus on developing evidence-based strategies to enhance the effectiveness of Marxist Theory education, ensuring its relevance in both academic and societal contexts.

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