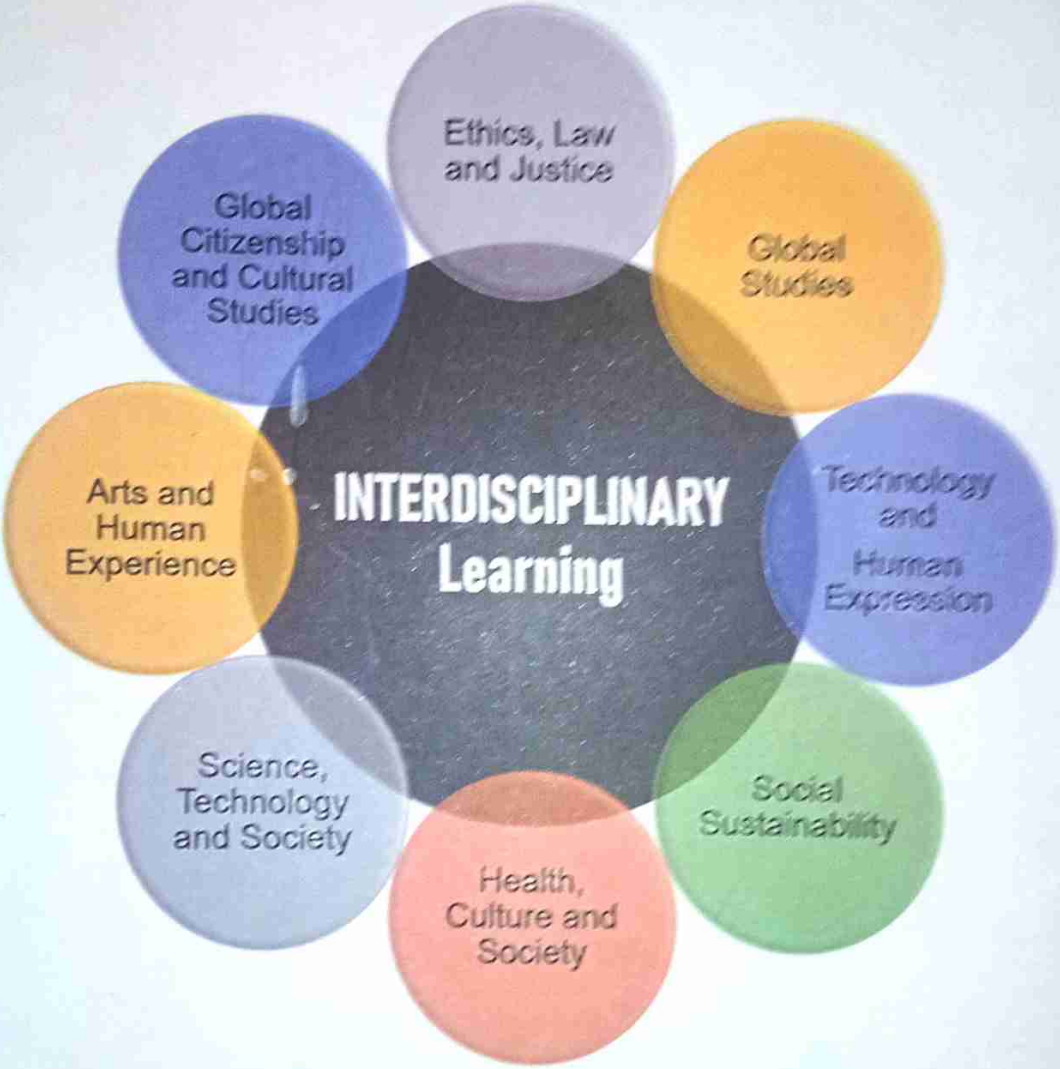
A Tapestry Of Interdisciplinary Insights In The NEP Era



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Chapter 5
META-HEURISTIC: ADVANCED SEARCH OPTIMIZATION ALGORITHMS

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ABSTRACT
One way to describe metaheuristic algorithms is as a type of stochastic optimization algorithm that does not rely on the surface gradient for optimization. To increase fitness, these algorithms are inspired by many different things, but for the most part, they are drawn from nature. Due to the wide range of engineering and artificial intelligence applications, they have been an active study topic. Complex optimization problems are solved using tools called metaheuristic optimization algorithms, which are founded on mathematical ideas. When information is scarce, imprecise, or computing power is limited, these algorithms are designed to find or provide a good enough solution to an optimization problem.
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1. INTRODUCTION
Numerous complicated issues that arise in real-world circumstances have been solved using meta-heuristic optimization techniques, and this technique's significant rise in popularity is attributable to a number of factors. They have a straightforward, adaptable attitude. They can avoid local optima and their derivation is mechanism-free. Due to their realistic or natural characteristics, meta-heuristic algorithms are highly straightforward [4,8,9]. These algorithms' sources of inspiration include natural occurrences, animal behavior, and physical phenomena. Without altering the algorithm's structure (which is independent of the problem), these methods are adaptable and simple to apply to a variety of real-world challenges. Only the inputs and outputs of the particular problem instance are decided by researchers. One of