© APR 2026 | IRE Journals | Volume 9 Issue 10 | ISSN: 2456-8880
DOI: https://doi.org/10.64388/IREV9I10-1716180

Personalized Career Guidance for School Students for Smart Education

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Abstract- ***Career selection is a vital decision which has a strong impact on the academic and professional future of a student. Traditional forms of career counseling methods offer generic advice and do not give appropriate regard to individual aptitude, personality traits and performances at school. This paper suggests a Personalized Career Guidance System which combines psychometric analysis and clustering methods for obtaining customized career guidance to school students. The system uses available academic information, cognitive capabilities and psychological characteristics as input parameters for assigning students into meaningful groups and for making specific career recommendations. Experimental evaluation showed better recommendation accuracy and better student satisfaction than traditional counseling methods. The proposed system is supportive to smart education by enabling structured, data-driven and personalized career planning.***

Index Terms- ***Career Guidance, Psychometric Analysis, K-Means Clustering, Educational Data Mining, Personalised Recommendation System.***

I. INTRODUCTION

Choosing an appropriate career path is one of the challenging tasks for many students during their school education. Limited awareness of retirement career opportunities - Limited structured guidance is often the factor causing confusion and poor decision making. Traditional counseling systems generally have a uniform approach of advisories, which fails to take care of individual differences in aptitude, interests and personality. Recent technological advances in the field of artificial intelligence and educational data mining have made it possible to create intelligent recommendation systems that can personalize decision-making processes. In addition, research suggests that adaptive and data-driven educational systems have changed the degree of student engagement and confidence in academic planning significantly. Motivated on these developments, in this paper we introduce a clustering-based personalized career guidance framework, targeted at school students, at secondary level in particular.

II. LITERATURE REVIEW

Artificial intelligence and data analytics have been increasingly used in education-based environments in order to provide personalization and also precision by decision support. Previous studies highlight the importance of AI based tools to help improve student engagement and learning outcomes. Personalized recommendation systems have proved to be more effective than regular static advisory models.

Clustering techniques have been used extensively in education data mining to categorize pupils according to their learning patterns, cognitive skills and behavioral features. Cognitive ability modeling has led to great improvement in academic recommendation systems. However, many available career guidance systems are purely based on questionnaire approaches and offer no integration between the psychometric profiling methods and the algorithmic student grouping.

The proposed system attempts to fill this gap by conducting a combination of psychological and data analysis based on clustering to make the recommendation better and more personalized.

III. PROPOSED SYSTEM

Traditional career counseling approaches often make generalized recommendations with little emphasis on proper analysis of a student's academic performance and psychological characteristics. As a result,

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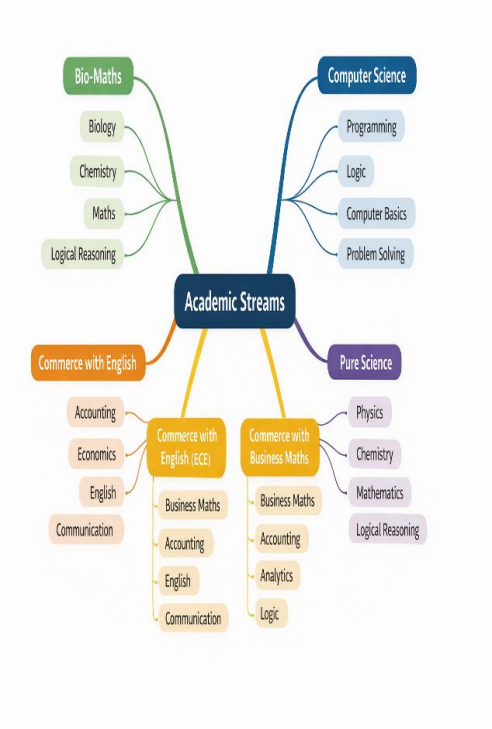
students can be presented with career suggestions that don't match their strengths and interests.

To address these limitations the research approach we propose here, the Personalized Career Guidance System, combines psychometric evaluation and K-means clustering. The system gathers information about the student's academic and psychological history, processes the information, segregates students according to how alike they are, and produces structured career recommendations. This way, personalized, consistent, data-driven guidance for school students is ensured.



IV. METHODOLOGY

4.1 Data Processing and Collection.

Structured tests are carried out in order to gather information about students, including their academic achievements, aptitude tests, and their preferences.

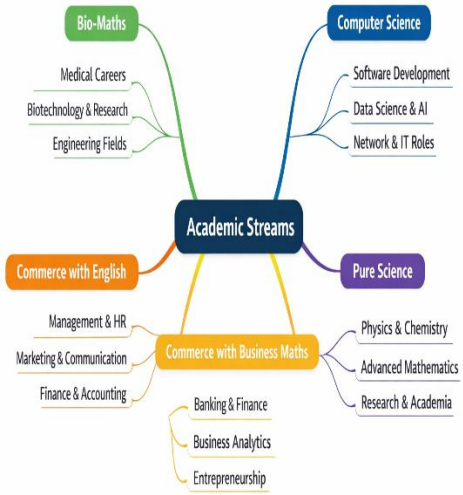
Data preprocessing techniques such as normalization, feature scaling and missing value treatment are applied to maintain accurateness and consistency. So, comprehensive preprocessing helps out to improve performance of clustering and accuracy of recommendations.

4.2 Psychometric Evaluation

Normalization of data, scaling features and missing value handling are also used as data preprocessing to give objectivity and consistency. Clustering the data and recommendation accuracy is enhanced by appropriate preprocessing.

4.3 Student Grouping through Clustering

Data pre-processing methods such as normalization, scaling of the features and missing values are treated to ensure accuracy and consistency. Clustering is more effectively performed and recommendations more likely to have some truth when there is good preprocessing done.



4.4 Career Recommendation Engine

Known methods of data preprocessing (such as normalization, feature scaling, missing value handling, etc.) are used so that some precision and consistency are guaranteed. Clustering performance and reliability of recommendations is enhanced by proper preprocessing.

4.5 Feedback and Adaption earning

Such preprocessing methods as normalization, varying features and the use of missing values are implemented in the way to guarantee the accuracy and the consistency. Sanitary preprocessing enhances the quality of performance and accuracy of the recommendations of clustering.

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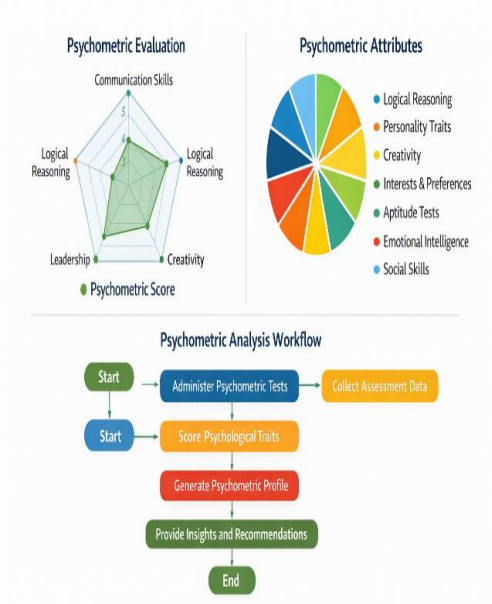
V. RESULTS AND DISCUSSION

Data preprocessing methods such as: normalization, feature scaling, and missing value management are used in order to build their accuracy and consistency. Clustering performance and reliability These are ameliorated by proper preprocessing to enhance the performance of clustering and the reliability of recommendations.

Preprocessing of data is done using methods such as normalization, scaling of features and missing value treatment to achieve accuracy as well as consistency. Clustering is better with proper preprocessing and recommendation accuracy can be enhanced.

The methods of data preprocessing such as normalization, scaling of features, and missing values are used to make sure that the data is accurate and consistent. Clustering performance and reliability of the recommendations is enhanced by proper preprocessing.

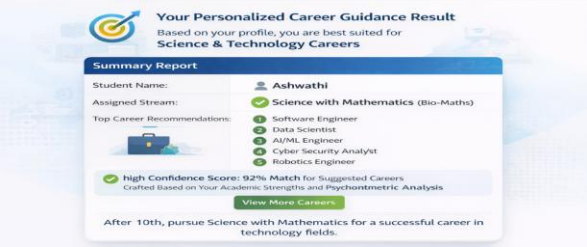


VI. CONCLUSION AND FUTURE SCOPE

Normalization, feature scaling and missing value dealing are also used as the data preprocessing methods that enable accuracy and consistency. The effectiveness of the clustering and recommendation reliability get enhanced with the aid of proper preprocessing.

Previous operations such as normalization, feature scaling, and missing values are performed on these processes to achieve accuracy and consistency of data. Doing proper preprocessing will enhance the performance of clustering and recommendations by increasing their reliability.

Normalization, feature scaling, and missing value manipulation are also put into use as ways of data preprocessing to make sure that the results are correct and stable. Clustering performance and reliability of a recommendation is enhanced with proper preprocessing.



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