



Abstract—Tracer studies investigate the career outcomes of graduates, encompassing job search experiences, employment conditions, and the application of acquired skills post-graduation. These studies are pivotal for universities and colleges to assess graduate success and shape educational policies. This study aims to elucidate the factors contributing to low job competitiveness through the application of classification models like KNN and Naïve Bayes. It also evaluates how competencies developed during university studies impact this scenario. Key issues addressed include the identification of factors causing low job competitiveness and the assessment of competencies trained during university education. Utilizing a dataset comprising two classes and seven features, the KNN method achieved an accuracy of 71.00%, while Naïve Bayes achieved 70.00%. The data set size is 1853 (around 20% of the survey sample) of unemployed alumni. The results indicate that the lack of specific competencies, particularly those related to practical skills and real-world application, is a major factor contributing to low job competitiveness. The results highlight a specific competency as most crucial in the KNN model, whereas different competencies play significant roles in the Naïve Bayes model. Despite variations in competency importance across models, all features significantly contribute to predictions. This research enhances the classification of workforce competitiveness levels within tracer studies and underscores the potential of KNN and Naïve Bayes algorithms to identify factors influencing low job competitiveness. These findings support informed decision-making in academic and career development initiatives, emphasizing the critical influence of university-trained competencies on job market readiness.

Keywords—Tracer Study; University graduates, K-Nearest Neighbors (KNN); Naïve Bayes; Job Competitiveness.