

## **Systems Based Assessment of Multiple Choice Questions (MCQs) for Quality Assurance in Testing**

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**ABSTRACT** This study aimed to assess the properties of MCQs using various courses in a novel holistic approach employing quantitative-comparative design. The data were collected from two university campuses in Saudi Arabia offering a Bachelor of Science in Nursing (BSN) program between 2018 and 2020. The multiple-choice questions on 'item difficulty' ( $34.36 \pm 17.42$ ), 'item discrimination' ( $0.32 \pm 0.20$ ), and 'option affinity' ( $0.32 \pm 0.16$ ) were reasonably good. The 'lexical density' was "Very Complex" ( $85.08 \pm 13.37$ ) with the Basic Adult Care Nursing final examination ( $91.54 \pm 9.42$ ). The 'readability index' was low ( $7.65 \pm 3.08$ ) in the Fundamentals of Nursing I Theory final examination ( $6.18 \pm 3.13$ ), but "High" in information entropy ( $4.23 \pm 0.10$ ) with the Fundamentals of Nursing I Theory examination ( $4.25 \pm 0.11$ ). Statistical differences ( $<.001$ ) were noted in option affinity, 'lexical density,' and 'readability index. Further, the multilayer perceptron (MLP) prediction model shows 'lexical density' (100%) as the most important. Findings indicate the need for quality assurance measures in the form of faculty training.