

The Use of Cluster Analysis to Group Examination Candidates

M.D.Buckley-Sharp, A.N.Hamlyn, F.T.C.Harris
British Journal of Medical Education, 1969, **3**, 225-231

Traditional examination techniques allot a rank on the basis of the scores derived from assessment procedures such as essays, vivas, or objective examinations. The accuracy which can be attached to such a rank will vary enormously depending on the statistical sophistication of the ranking technique used. However accurate the technique may be, an inherent disadvantage of this approach is that the result provides a single statistic which attempts to summarize a wide range of factors. Another disadvantage is that a rank assigns a candidate to his own group - that is, a candidate who is fifteenth is assigned to that group of candidates who are fifteenth in the rank order, although such a group may contain only one person. The number of groups which may be defined may thus equal the number of candidates. However, the minimum number of groups which are definable under the assessment procedure will depend not on the candidates, but on the number of criteria or postulated characteristics that the examiner hopes to investigate. To be included in the overall scheme, each criterion must be stated and adequately tested within the assessment by accurate and reliable methods. On this basis, the number of candidates may be larger than the number of groups into which they should properly be placed, resulting in spurious accuracy. In some regions of the scale, this effect may be more marked than in other regions. The converse is also true; there may be more groups available than candidates to fill them.

Conclusion:

Techniques of cluster analysis are used to show that data obtained even from a simple one-subject multiple-choice examination can provide a new approach to the classification of examination candidates. The technique of cluster analysis is explained by reference to a simple classification of examination scores, resulting from division about the means of the two examination subsections. It is shown that the technique of cluster analysis is valid and that its results are significant. It seems that the technique may be used to throw a new light on the way the teaching and learning of subjects can be described, and perhaps provide greater knowledge about the candidates themselves.