ABSTRACT

The purpose of this study was to investigate similarities and differences in the quality of data representations produced by end users using the relational model (RM), the extended entity-relationship model (EERM), and the object-oriented model (OOM). The quality was evaluated through five constructs of a data model (i.e., entity/object, descriptor, identifier, relationship, and generalization hierarchy) and six facets of a relationship (i.e., unary one-to-one, unary one-to-many, binary one-to-one, binary one-to-many, binary many-to-many, and ternary many-to-many-to-many).

The study was an empirical investigation involving MIS major students. The subjects were trained by the experimenter in using one of the data models for database design, and then asked to read either case 1 (low complex task) or case 2 (high complex task), and generate the assigned application data model which was evaluated using instruments developed by the experimenter. The instruments were reviewed by database faculty to ensure that there was no bias in favor of any one of the three models, and were validated in a pilot test.

The research focused on two major issues: data model design and data model conversion. The first issue investigated the differences in user performance between the RM, the EERM, and the OOM. The second investigated the differences in user performance between the RM and the

relational forms of the EERM and the OOM. For the first issue, results indicated that the EERM and OOM scored much higher than the RM in the correctness scores of the binary one-to-many and binary many-to-many relationships, but only the EERM led to significance. The RM and OOM scored much higher than the EERM in the correctness score of the unary one-to-one relationship, however, only the RM resulted in significance. The OOM required significantly less time for task completion than the EERM. For the second issue, results indicated that the RM and the relational form of the OOM scored significantly higher than the relational form of the EERM in the correctness score of the unary one-to-one relationship.