



DEVELOPMENT AND VALIDATION OF TESTING SOFTWARE AND COMPUTERIZED QUESTION BANK IN ENGLISH

Dr. N. Balasubramanian

Former Professor & Head , Department of Education , Bharathiar University , Coimbatore , Tamil Nadu.

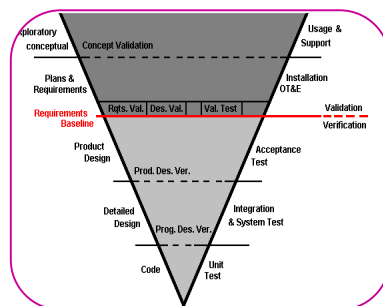
ABSTRACT

The computers could be made use of not only as an aid to construct but also to administer tests in the context of educational evaluation all levels. Computerized test construction makes use of utilizing the capabilities of the computer system to generate, print and administer the test to the learners and score their responses. Moreover, networks of computer terminals will facilitate administration of the tests directly to the learners right at the terminal. If we carefully use the system, we can save a substantial amount of time besides making the evaluation system free from stress. Once the test items become ready after field tryout and item analysis, the computer can save the items in pools or banks which could be accessed at the time of need. Once decided, the selected items at the given specifications such as type of items, level of cognition, difficulty level and discriminative power, etc. could be printed, duplicated and distributed to the learners. Most of the time, the examinees record their responses on machine – readable forms for computerized scoring. It is possible to call the test items in the same order as have already been saved in the system or even they could also be drawn at random before printing and duplicating. Again, it is also possible to call the chosen randomly for each examinee so that each of them could answer the same questions but printed in the different order. In this paper, the Researcher presented the development and validation of Computerized Question Bank in English.

KEY WORD: Computerized uestion Bank, Question Bank Software, Item Analysis, Discriminative Power and Difficulty Level.

INTRODUCTION

The computers could be made use of not only as an aid to construct but also to administer tests in the context of educational evaluation all levels. Computerized test construction makes use of utilizing the capabilities of the computer system to generate, print and administer the test to the learners and score their responses. Moreover, networks of computer terminals will facilitate administration of the tests directly to the learners right at the terminal. If we carefully use the system, we can save a substantial amount of time besides making the evaluation system free from stress. Once the test items become ready after field tryout and item analysis, the computer can save the items in pools or banks which could be accessed at



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STATEMENT OF THE PROBLEM

Computer as a tool in educational evaluation makes use of its systematicity and multidimensionality in making the evaluation process interactive as well as individualized so far as an individual is considered because of its self – pacing, immediate feedback, freeness from inhibition, etc. It can also motivate the learner take up the evaluation in a friendly manner. However, there has been no conclusive evidence whether computer is a positive force in educational evaluation, worth an enormous investment in different cultural and social groups. Research in this area may facilitate the decision makers to face the new challenges arising from the increasing use of computers in the society. Hence, it is high time that the educational technologists who are also specialized in computer applications should endeavor to exploit the advantages of the new medium with a view to ensure that quality assessment of academic excellence occurs in schools and colleges.

OBJECTIVES OF THE STUDY

The objectives of the study are stated as follows:

- i) To develop a software package for construction and administration of tests so as to enable the instructor to utilize the capabilities of the computer to help generate, print, score tests and prepare the profiles of the learners' performance.
- ii) To develop a standardized objective type question bank, specifying the psychometric characteristics of each item for writing skill.

DEVELOPMENT OF THE TESTING SOFTWARE PACKAGE

The two issues, the nature and content of the test and the manner in which it is presented are seriously taken care while developing the computerized testing process. It involves the construction of software package which handle many different kinds of tests. It is to determine the nature of the test and how to administer the same to the examinees since these are the major phases of the testing process. The same test may be availed for various purposes and consequently, be interpreted according to its objectives which necessitate closer attention to these aspects of the test that affect anxiety. The software administering the evaluation must fulfill the requirements and expectations of the examinees for whom it is planned. The objectives of a test should be in accordance with the objectives of the curriculum prescribed for a particular level. Elimination of the doubts and uncertainty as to the objective of the evaluation in addition to deciding the number of questions to be allocated to each objective without sacrificing the quality of the testing process is the most important feature of the testing process. The length of the test may be decided depending upon the number of questions needed to satisfy its objective. The nature of the examinee who takes the test can also influence the length of the test. Motivation, reading level and physical environment are also the main factors that could also influence the length of the test. It is possible to draw the item from a pool of questions previously fed into the system by means of generalized algorithm or procedure which may substitute particular values each time the items are needed. These values may be previously saved or be generated randomly as and when we need. The test can either present all items in the pool or can sample from it depending upon the number of items already fed into the system. If the test is drawn from a large pool of items, the possibility of drawing the same test to two or more examinees will be diminished. If there is a very large number of test items in the system, it is possible to create different tests each time the same test is administered besides discouraging the dissemination of questions. When the items in the bank provide correct stimuli to elicit the desired response from the examinees, their validity will be immensely increased. The items must test the stated objectives only. Familiarity with the computers or otherwise of the examinees may affect their test performance. Sometimes, it may also happen that the person who knows the answer to a question may be judged incorrect for the reason that he may miss to

input the answer in exactly the way testing system requires. Whether formal or informal, the tests should provide some feedback to the examinees. Some tests do not provide immediate feedback as to whether the person concerned passes or fails. Many times, feedback is given late until the test has been officially received. The feedback may be given immediately after responding to a particular question. Or, it may be delayed until the entire test is over. The tests can be graded immediately and provide useful directed feedback while the content of the test is still fresh in mind with the help of the computer facility (Alessi & Trollip, 1985).

While developing the Question Bank Software, care was taken to give due consideration for different aspects at different phases of the test as detailed by Alessi & Trollip (1985):

Before the Test

- Giving directions to the examinee
- Giving the purpose of the test
- Giving opportunity for practice
- Talking decision when to start the test

During the Test

- Displaying one question at a time
- Keeping the question format consistent
- Providing easy access to questions
- Providing capability to change response
- Providing capability to browse through the question
- Not penalizing for format errors

After the Test

- Giving the results immediately
- Giving detailed feedback
- Providing for students' comments
- Storing all necessary data

The QBS comprises two modules, viz., Teacher Module and Student Module. The teacher module is used for generating the question paper for the test. The software provides for selecting the items with the given specifications viz., Difficulty Level, Discriminative Power, Type of items, viz., Multiple Choice, Fill in the Blanks, True or False, Yes or No, Matching, etc. Item attributes viz. Knowledge, Understanding, Application/Expression. The items be would generated from the Question Bank at random but within the given specifications.

The QBS provides for the teacher to add, edit, delete the items under different types of items. Accordingly, each item in different types, viz., MCQ, True or False, Fill in the blanks, etc., could be added with reference to Topic Code, Entry No., Quality, viz., Knowledge, Understanding, Application, Difficulty Level and Discriminative Power. The QBS also provides for the teacher to get the achievement profile of the given examinee.

The Student Module provides for the examinee to take the test with reference to his identification Number, Name, Date of Birth, Education, Name of the Institution, Hobby, etc. The examinee can take the test as already designed by the teacher. If the duration of the test is over as already determined by the administrator, the test would automatically come to an end. Once the test is over, the examinee could look at the scores he obtained in the test, if he desires so.

DEVELOPMENT OF QUESTION BANK IN ENGLISH

Testing and evaluation are the integral parts of any teaching and learning programme. Tests are used for assessing students' progress during the teaching learning process. If the tests are to be a valid measure of learner achievement, they should be based on the objectives of the proposed instruction. In the context of teaching and learning of a language, listening, speaking, reading and writing are the main

components of the teaching-learning process. A knowledge of grammatical structures and vocabulary is important for learning a language. Knowledge of the elements of language, comprehension and expression are the main objectives in language learning. Hence, it is the test administrator's task to measure accurately the learners achievement in developing these abilities.

A knowledge of vocabulary and structure is vital in using a language. Vocabulary tests may test the learners' knowledge on the meaning of words and phrases in context. Testing grammatical structures may be helpful in knowing how far a learner is able to manipulate the structures of a language in addition to distinguishing between appropriate and inappropriate grammatical forms.

Objective type questions are most appropriate for testing vocabulary and structures. Comprehension is students' ability to grasp the meaning of the central idea to the critical evaluation of the content. MCQs may be successfully employed for testing comprehension without resorting to the expression skills of the learners. Expression is nothing but the ability of the learner to put his ideas in proper sequence using proper vocabulary and structures. The main aim in testing the expression of the learner is to assess the extent to which a student manage to use appropriate words, phrases and structures with a view to communicate his ideas. Relevance of items, proper organization of content, correct spelling and punctuation and proper choice of words and structures are vital for testing expression of the learners.

In developing the Question Bank in English for the students of Std. VIII, the investigator has taken up care in the following activities:

1. Collection of items of various types viz., synonyms, antonyms, phrasal verbs, word formation, determiner, prepositions, pronoun, degrees of comparison, tense forms, concord, active and passive voices and reported speech.
2. Framing the questions at various types viz., True or false, Yes or no, Fill in the blanks, Matching, Spotting Errors and Multiple Choice Questions.
3. Identifying the attributes of each item viz. knowledge, understanding and application / expression.
4. Conducting pilot study in selected schools
5. Taking up item analysis through computer programming
6. Establishing the indices of Difficulty Level and Discriminating Power for each item.

Collection of Items for the Question Bank

The investigator besides framing his own items has gleaned / rephrased/ restructured all together one thousand items covering the language aspects viz. Synonyms, Antonyms, Phrasal Verbs, Word formation, Determiner, Prepositions, Pronoun, Degrees of Comparison, Tense Forms, Concord, Active and Passive Voice and Reported Speech having referred to many a publication. Care was taken to see that all such items so framed/gleaned/ restructured / rephrased were within the reach of the students of Std. VIII (Balasubramanian, 2014).

The investigator has identified the attributes of each item viz. knowledge understanding and application / expression. Due care was taken to see that approximately 40% of the items are at knowledge level, 30% of the items are at understanding level and the remaining 30% of the items are at application/expression level. The above said one thousand items were pooled into ten sets of question papers each having maximum of one hundred items.

Pilot Study

The pilot study was conducted in the following eight schools located in and around Coimbatore city:

1. Chinmaya Vidyalaya Matriculation Higher Secondary School, Vadavalli, Coimbatore
2. Govt. Higher Secondary School, Thondamuthur
3. Bharathi Matriculation Higher Secondary School, Coimbatore
4. Sri Gopal Naidu Higher Secondary School, Coimbatore
5. Corporation Girls' Higher Secondary School, Ranganathapuram, Coimbatore
6. Sri. K.K. Naidu Higher Secondary School, Coimbatore

7. Govt. Girls' Higher Secondary School, Raja Street, Coimbatore
8. The Suburban Higher Secondary School, Coimbatore.

While administering the pilot study, care was taken to see that all the ten sets of the question papers were distributed among the students of Std. IX studying in the afore said schools. Deliberate attempt was made while conducting the pilot study to see that one or more sets of the question papers were distributed among the students of each of the said schools. Thus, each set of the question papers was administered to exactly one hundred students. Ultimately, one thousand students were given the tests in all the schools taken together.

Item Analysis

Steps in Item Analysis

1. Correction and scoring the test papers
2. Arranging the test papers in the order of scores
3. Dividing the test papers with three piles
 - i) 27% from the one end of the order
 - ii) 27% from the other end of the order
 - iii) 46% of the remaining papers not used in item analysis
4. Counting the frequencies in respect of each item and for each group and converting the frequencies into percentage.
 - i. Number of pupils who answered a certain item wrongly
 - ii. Number of pupils who omitted that item.
5. Calculation of Difficulty Level and the Discriminating Power for each item
- 6.

$$\text{Difficulty Level} = \frac{\text{PH} + \text{PL}}{2}$$

$$\text{Discriminating Power} = \text{PH} - \text{PL}$$

where PH means the percentage of the high group and PL means the percentage of the low group.

7. Selecting the required items keeping in mind the difficulty level and the discriminating power of each item.

By means of a computer programme, the Difficulty Level and the Discriminative Power have been computed for all the one thousand items keeping one set of question paper comprised one hundred items as a single unit. Accordingly, there were ten single units of question papers considered for item analysis. As has already been planned, all the items in the ten sets of question papers were taken for inclusion in the question bank unmindful of the difficulty level and discriminative power of the items concerned.

DELIMITATIONS OF THE STUDY

The delimitations of the study may be stated as follows:

1. Keeping in mind the practical difficulties involved in administering the pilot study to a few thousand students spreading over a wider area in the context of developing the Question Bank in English, the study was limited to one thousand students only that too those studying in the schools located in and around Coimbatore.
2. While selecting the content areas in English Grammar in the context of developing the QB, the Investigator was not able to do full justice to cover more elements of grammar in English.
3. In the context of developing the Question Bank Software, Visual Basic Programming Language was chosen which may bring out compatibility problem while running the software at different locations due to changing advancements in operating systems.

EDUCATIONAL IMPLICATIONS OF THE STUDY

The educational implications of the study are stated as follows:

1. In conjunction with other process-product studies, this study contributes to the knowledge in the context of teaching of English as a second language at upper primary/secondary level.
2. This study provides a rich fund of knowledge for identifying the emerging problems when Computerized Question Banks are introduced in schools taking appropriate strategies in widespread induction of computers in schools.
3. The computerized question bank developed in the study with unique features viz. the indices of Difficulty Level and Discriminative Power, type of questions, level of cognition, etc. could be used as an aid to construct as well as administer tests in the context of teaching of English at Upper Primary and Secondary levels of Education. It enables utilizing the capabilities of the computer system to generate, print and whenever needed administer the test to the students and score their responses.
4. If there are networks of computer terminals available in the schools, it may ensure easy administration of the tests directly to the learner right at the terminal.

SUGGESTIONS FOR FURTHER RESEARCH

Suggestions for further research in the area of Computerized Evaluation in ELT may be stated as follows:

1. An exploration and exploitation of the availability of media based testing materials in the internet as Open Educational Resources may be made in the context of teaching and learning of English as a second language.
2. Computerized Question Banks in English could be developed covering enormous no. of items with full fledged psychometric values so that online testing could be conducted among student community.
3. Studies may also be taken up to find out how far the teachers and the learners are benefitted of the e-learning materials so called Open Educational Resources for their personal/professional developments.

CONCLUSION

The nearby school could share a large pool of questions covering different topics so that access could be accomplished by means of a terminal located at the school and connected to the central computer system by telephone line. When the test is ready, it can be printed out at the schools for duplication. As it involves a number of teachers in providing the test items to the pool, the teacher could have instant access to a large number of items than ordinarily they would have. This may enable them to construct different items each time and thus minimize the risk of question paper being leaked. In this arrangement, the burden of a particular teacher is reduced to the maximum extent possible. It is true that computerized tests may develop anxiety during the evaluation process and result in scores that may not accurately reflect the learners' mastery over the content taught.

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ACKNOWLEDGEMENT:

This paper is based on the unpublished report of the ERIC Project funded by the NCERT, New Delhi entitled “Effectiveness of Computer Assisted Language Learning and Testing in the Context of Learning English as a Second Language at Standard VIII” and submitted to NCERT, New Delhi in 2014.