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"DEVELOPMENT AND VALIDATION OF BRANCHING PROGRAMMED MATERIAL IN ENGLISH GRAMMAR"

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Abstract:

"A programmed instruction is a method of self instruction that enlists machines or specially prepared books to teach information"-Chris Jordan.

It is a step-by-step teaching method, employing small units of information or learning material and frequent testing, whereby the student has to complete one stage before moving to the next. Hence, branching programming is one of the types of programmed instruction, through which a learner can learn with ease and effectively. The main purpose of the study is to develop a valid material in order to improve learning outcomes. The material is well structured based on the principles of exposition, diagnosis and remediation. Thus, the researcher developed the material consisting of ten units from the English grammar textbook of PUC I and II year. The views of the experts were also obtained for the final draft of the material. the researcher has followed three types of testing: i) Individual testing ii) small group testing and iii) field testing of validation testing. The statistical technique Pearson product moment correlation was used. The reliability of the material is r = 0.7. Therefore, the developed material in branching programming found valid and reliable.

Key words: Validation, English grammar, programmed instruction, branching programming

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Introduction:

India is tremendously progressing in the field of technology. Educational technology is a field of study that investigates the process of analyzing, designing, developing, implementing, and evaluating the instructional environment and learning materials in order to improve teaching and learning. In fact it is very much helpful in individual learning. It is learner centered approach which gives emphasis to the method by which material can be presented to all. It also helps in catering the needs and abilities of the learner. The use of programmed material acts as a remedial instruction in every classroom. Thus, the programmer developed the material and validated.

Need and significance of the study:

The programmer has undergone the problem of learners in English. As it is need of the hour for every student in his career. The higher secondary students will be on the right path if it is rightly directed by the teachers. Most of the schools are in rush to complete their syllabus rather than developing skills in the language. Grammar is main base for any of the language command. So, with this the researcher has developed branching programmed material in English grammar, where the material is presented with information in small steps referred as “frames”. Therefore, this made the researcher to help the students to acquire the understanding of essential concepts of English grammar.

Literature review:

Gann, Linda (2016): This paper reports on the initial development and validation of the Mathematics Teachers' Beliefs about English Language Learners survey, an instrument that measures SMTs beliefs, attitudes, knowledge base, and instructional practices in relation to meeting the academic and language needs of ELLs. Through piloting processes, the instrument was refined for a research study through which reliability and validity were established. ***Cannon, Joanna E (2014):*** In the present study, content validity evidence was collected to determine the degree to which elements (e.g., grammatical structures, items, picture responses, administration, and scoring instructions) of the Comprehension of Written Grammar (CWG) test are representative of the construct of interest and appropriate for deaf and/or hard of hearing (DHH) students. Suggested revisions to the test, based on the feedback provided by the SMEs, are discussed. ***Koizumi, Rie; Sakai (2011)***: This article reports on the development and validation of

the English Diagnostic Test of Grammar (EDiT Grammar) for Japanese learners of English. From among the many aspects of grammar, this test focuses on the knowledge of basic English noun phrases.***I M Badiyani (2005):*** This study is about preparation and try-out of Computer Aided Language learning package for teaching of Action verbs in English language. The programmed material found valid.

The researcher has come across the researches on development and validation of program. Therefore from the above reviews the study has not done at higher secondary level. So, this motivated the researcher to take up a study on development and validation of Branching programmed material.

Operational terms defined:

1. **Validation**: Assessing the degree to which an instrument accurately measures what it purports to measure, or a statistical technique or test accurately predicts a value.
2. **English grammar**: "Grammar is the sound, structure, and meaning system of language. All languages have grammar, and each language has its own grammar" (Beverly, 2007, p.1). People who speak the same language are able to communicate with each other because they all know the grammar system and structure of that language, that is, the meaningful rules of grammar.
3. **Programmed instruction**: Programmed instruction is a method of presenting new subject matters to students in a graded sequence of controlled steps. Students work through the programmed material by themselves at their own speed and after each step test their comprehension by answering an examination question or filling in a diagram
4. **Branching program**: it is a technique provides the student a piece of information, presents a situation requiring a multiple choice or recognition response, and on the basis of that choice instructs the student to proceed to another frame.

Objectives of the study:

1. To design programmed material for PU level in the light of selected objectives of teaching English.

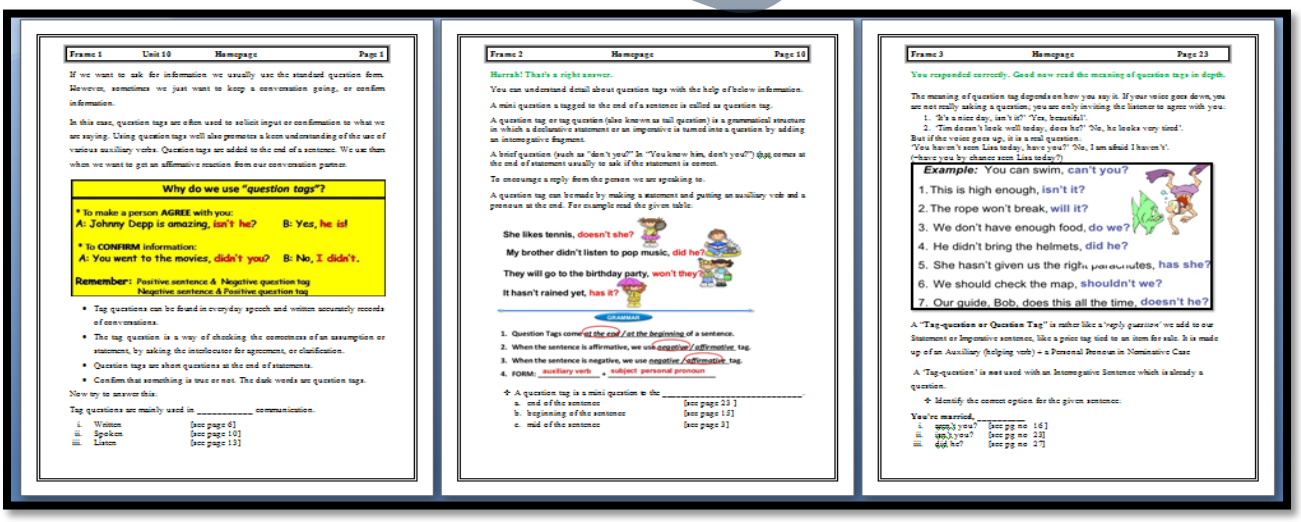
2. To validate the developed branching programmed material on selected sample of student.

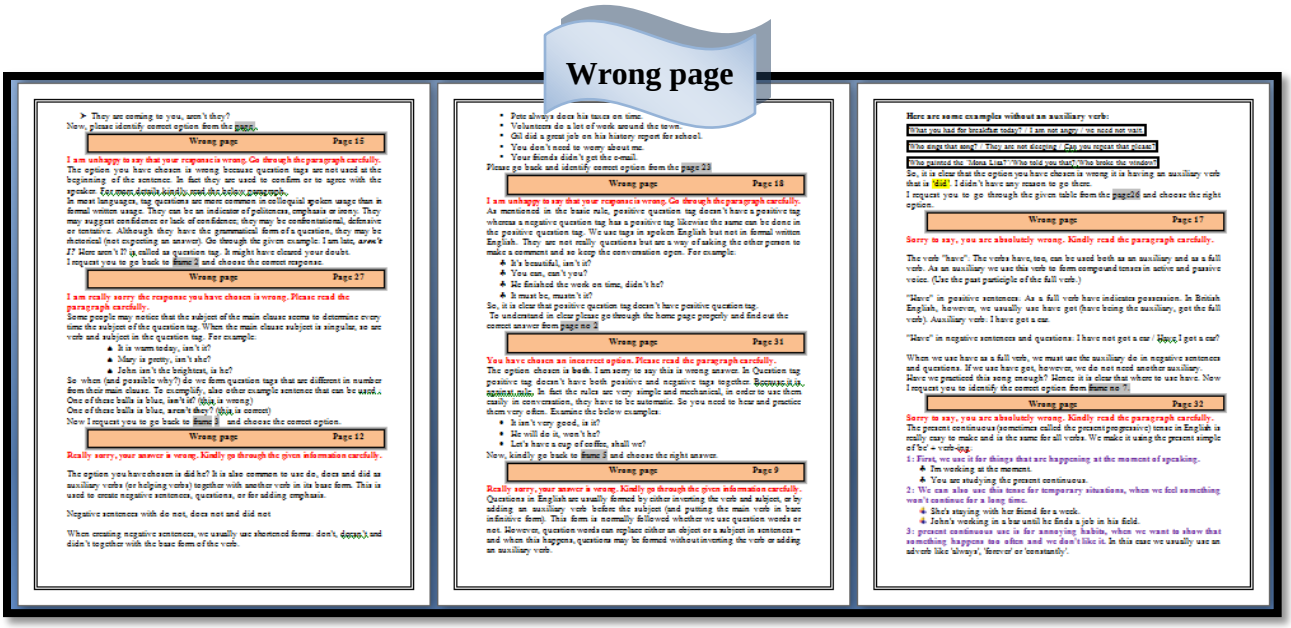
Methods of developing material: The development of programmed instructional material on the selected topic underwent the following stages:

- ❖ Preparation of the programmed material
- ❖ Writing of the material in branching style
- ❖ Try out for modification
- ❖ Evaluation of the programmed material

Through these phases the researcher developed a programmed material on the basis of small group try out and finally the programmed material was administered on the large group. Then on the basis of students' score, it was empirically validated in order to test the effectiveness of the programmed material. The unit of question ta[illegible]on re[illegible]presented (sample) below likewise other units were also prepared in the material.

Homepage





Evaluation and validation of a program: It is the final stage in the development of a program. It refers to the testing of thee material during its developmental process and to the strategies to improve its effectiveness. These are of three types:

1. **Individual testing**: the main purpose of this testing is to identify how far the material is essential, in fact to check whether it is suitable for whom it is written. The student is informed that he is not being tested, but that he is helping programmer in revising. Before try-out the programmer establishes proper rapport with the students to put him in the proper frame of mind. For this purpose the programmer has selected 10-15 individual students of science, arts and commerce. On the basis of students' reactions, the programmer gathers some insight to improve and modify the frames.

2. **Small group testing**: Descriptive survey method is applied to collect the data. Before testing, the programmer has administered pre-test in order to find out the extent of their knowledge in English grammar. After pre-test, the students are given detailed instructions in the mechanics of taking the program. The programmer distributes the copies of a programmed material and asks the students to go through the material and to underline the difficult areas in a frame. The starting and finishing time was recorded. At the completion of the pre-test once again the criterion test is administered as post-test on all the students of small group to find out whether the learner has actually picked up the intended terminal behavior. Soon after the criterion test the programmer analyzed the scores statistically to find out the reliability. The reliability of the material is **r = 0.7**, hence it was ready for field testing.

3. **Field testing of validation testing**: the purpose of the field testing is to assess whether the program satisfactorily achieves its stated objectives. There are six steps in the validation of the program: Selection of sample; administration of pre-test; administration of the program; administration of post-test; administration of attitude scale and analysis of criteria of the program. Conduct of test already mentioned in the above testing.

Criteria of the program: For the validation of the material certain criteria were followed and are analyzed after all relevant data have been obtained. These measures classified into two groups:

(A) Internal criteria	(B) External criteria
• Error rate	• $^{90}/_{90}$standard
• Programme density	• Attitude coefficient
• Sequence progression	• Gain ratio
• Frame inventory	• Level of performance

Internal criteria

1. Error rate of the program:

Sl. No	Units	Error rate (%)	% of success
1.	Homophones	1.8	98.2
2.	Pronouns	1.8	98.2
3.	Prefix suffix	1.1	98.9
4.	Phrasal verbs	1.3	98.7
5.	Idioms and phrases	2.1	88.9
6.	Reported speech	1.8	98.2
7.	Articles	1.9	97.1
8.	Synonyms and Antonyms	1.8	96.2
9.	Active and passive voice	1.3	98.7
10.	Question tags	1.02	98.9
	Total	15.92	84.08

The following formula is used to calculate the error rate percentage:

$$\text{Error rate} = \frac{Total\ No.of\ errors\ X\ 100}{Total\ No.of\ frames\ X\ No.of\ students}$$

Percentage of overall errors in the program is as follows:

Total no. of errors = 123

Total no. of frames = 107

Total no. of students = 30

Error rate = 4.01%

Percentage of success = 100 - 4.01= 95.9%

Therefore, the error rate of the program is less than 10%, the criterion suggested by Norman Crowder to check the validity of an effective program.

2. Programme density:

Density is an independent measure of the difficulty of a program. Density functions as an indirect measure of the rate at which material is introduced. Green (1962) has given two types of density.

Independent density: This is the density of a single frame or a group of frames comprising of a program. Density of each section is independent of one another. Therefore the program material is divided into section of equal number of frames.

Cumulative density: It is the indirect measure of the difficulty level of the programmed material. It takes into account the prior appearance of specific terms on preceding frames. Most of the programmers have used type/token ratio (TTR) as the measure of density of a programming. Hence cumulative density is calculated as:

$$\text{TTR} = \frac{Total\ number\ of\ sections\ or\ concepts}{Total\ number\ of\ responses\ required} = \frac{150}{213} = 0.7\%$$

So, cumulative density is 0.7%

3. Sequence progression:

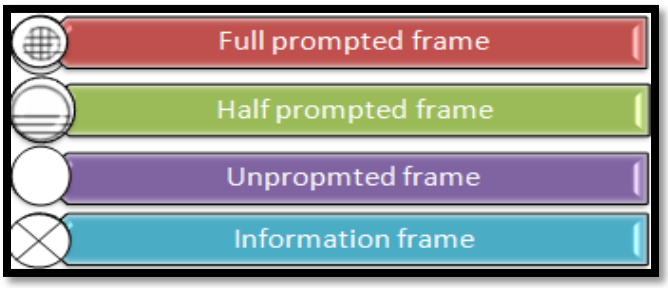
It is considered as an important indicator of the authenticity of the program. It helps the programmer to evaluate the logical arrangement of the parts of the program. The programmer has prepared a flow chart after administering the criterion test. For this purpose, 7 answer sheets of top scorers were selected. The chart consists of frame numbers in vertical line. The frame on

which the learner has made an error is shown by marking (x) and if they responded correctly it was marked (✓).

Therefore, flowchart gives us information concerning the location and relative frequency errors. The results revealed that the students obtained 85% of success.

4.Frame inventory analysis:

It is an important criterion for evaluating frames sequence. This measure provides the information regarding the structure and sequence of the frames and information regarding home and wrong pages as they have been used as frames. In designing frame inventory following symbols are used to denote the elements of prompting used. Therefore the programmer has used information frame followed by full prompted and half prompted frames in each unit accordingly.



External criteria:

1. $^{90}/_{90}$standard:

This measure can be adopted when the students are able to answer 90 percent of the frames in a program correctly. After administering pre test and post test, the researcher interpreted obtained scores as Expected gain and Real gain. It can be calculated as:

Expected gain = (100 – 38) = 62 percent

Real gain = (90 – 38) = 52 percent

$^{90}/_{90}$Standard = $\frac{Real\ \ gain}{Expected\ \ gain} = \frac{52}{62}$

Therefore the standard obtained is 52/62. It means the actual gain 52% through the program where as expected gain is 62%. It is found to be valid program.

2. Attitude coefficient:

It helps the programmer in evaluating the workability of a program is to measure student's reaction towards it. The learners are asked to rate each of the statement on any of three points:

agree, neutral and disagree. Therefore the reaction coefficient is 0.75 which shows that 75 percent of the learners agree with all the principles and characteristics of the program.

3. Gain Ratio:

According to Mc Guin and Peters, gain ration is the best criterion of a programmed effectiveness. It helps the programmer to identify the gain ratio between amount of learner and the amount that could by possibly be learned. It can be calculated as:

Gain ratio = $\frac{Mean\ of\ (Post\ test\ scores - Pre\ test\ scores}{Mean\ of\ (Full\ scores - Pre\ test\ scores)} = \frac{48-38}{51-38} = \frac{10}{13}$

Therefore the gain ratio is 10/13 which means that learners achieve 10 out of 13 points. It indicates the satisfactory gain.

4. Level of performance:

It is the simple criterion, to measure the level of performance. The mean value is converted into percentage. Therefore the level of performance of the students was identified by considering post test scores and their mean value. It is estimated that a good program should have 75% and above for the effectiveness of the program. Hence the level of performance is 90.1%

Suggestion and conclusion:

It is to suggest that programmed instruction material can be developed for regular classroom in order to have effective and meaningful learning. It is best suited for higher level of education.

To conclude it is proved that learning material in branching programming plays a vital role in programmed instruction. In fact is one of the leading methods for easeful learning. Students can enhance their skills, knowledge and understanding if they were facilitated with the learning material. Therefore on the bases of both internal and external criteria the effectiveness of programmed material is evaluated and found valid for the classroom use.

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