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Designing Need-Based Learning Material Properly? A Practical Guide for Teachers

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***Abstract*—Teachers who work on improving learners' performance often find it extremely difficult to develop learning materials tailored to their learners' needs. Creating new learning materials without a deep understanding can lead to weak outcomes and may widen the gap in the learners' language skills. Designing and creating effective learning materials should follow a series of steps. While books on designing new learning materials describe these steps in detail, they lack practical and statistical application. This paper serves as a clear guideline for teachers, offering a practical application of these steps based on the learners' needs, especially in syntax. The paper outlines these steps, starting with the analysis phase and ending with the approval stage, including the application of the material to a randomly selected group of learners.**

***Index Terms*—performance, self-learning material, quality education, syntax, kit**

I. Introduction

The teachers in charge find that selecting the best learning material for a specific student's level is an extremely difficult task (Abu Anzeh et al., 2022). Publishers offer a vast collection of different learning series for different learner levels but there is still a need for designing professionally developed learning materials to suit the learning needs (Al-Nofaie, 2021). The question is whether this learning material is suitable for learners' levels or whether changes should be made to address gaps in their learning.

Many researchers have studied the field of learners' difficulties in learning English as a second or foreign language (Al-Nasser, 2015). Their studies indicate that several factors contribute to these difficulties, such as the teachers' proficiency, the learners' background, the strategies used in the classroom, and the learning materials. Designing and implementing effective instructional materials is crucial for teaching and student learning. Research indicates that the strongest predictor of student achievement is teacher quality (Darling-Hammond, 2000; Rivkin et al., 2005; Yaseen et al., 2024), which includes the instructional practices and materials used.

Arab learners make various linguistic errors when using English in different situations. These mistakes occur because they do not fully understand the structure of English (El Sayed, 2020). Teachers also contribute to the issue by not providing adequate guidance to the students. These issues often stem from differences in the curricula used. Most curricula focus on teaching the four skills in general but neglect the importance of integrating language skills (Hinkel, 2006). Moreover, various teaching methods are also used, but students are not given the opportunity to engage in self-help activities (Al-Shara'h et al., 2021). Thus, creating self-learning materials to improve their performance and manage their learning process is essential. Such materials can support students in internalizing their understanding of the importance of learning English, quality education, and contribute to their independent learning outside the classroom.

The main aim of this research is to provide a practical example of these steps involved in proposing and developing any self-learning material. The given example focuses on proposing a single chapter consisting of three lessons in grammar. This topic was selected based on the results of the first step in proposing and developing learning materials, known as the need analysis step. This practical example serves as guidance for teachers, researchers, and curricula developers and designers who aim to enhance their learners' performance based on validated statistics taken from real exams.

II. Literature Review

Teaching and learning materials used in teaching are considered learning resources which contain the substance of certain achieved abilities. These learning materials include the necessary knowledge, skills, and ability to apply (Trainto, 2012). According to Aydin and Aytekin (2024), teaching materials are all forms of materials used to assist instructors and teachers in carrying out teaching and learning activities. These teaching materials are designed and arranged systematically to enable the students to learn actively. Some learning materials are designed with evaluative tests at the beginning and end of each chapter to measure the learning performance and learning outcomes.

Learning materials used in all academic institutions are books that are used to deliver knowledge and deepen the learners' understanding of specific topics. Therefore, they contain different tasks and exercises that can require active learning based on educational standards outcomes. They also focus on the development of effective, psychomotor and

cognitive aspects to make these learning materials more meaningful. Therefore, psychomotor in connected to the learning outcomes achieved by students through students' learning activities and practicum.

Designing learning materials should be addressed by implementing different processes to insure its suitability to the learners' needs. Borg and Gall's design is considered as one of the workable designs which depends on designing learning materials based on the learners' needs. This design is called Research and Development Design which contains different stages starting with the needs analysis stage until the final product. The need of analysis is the initial stage that diagnoses the learners' difficulties in achieving the learning outcomes.

Andriani et al. (2021) stated that developing learning materials starts at needs assessment phase which is commonly performed in early stage to diagnose subject's characteristics. Needs assessment refers to three phases: information collection, analysis, and framework development. Therefore, need assessment defines educational needs and decides which areas' priorities. These steps are followed by validation phase where the learning materials prove their quality after applying different adjustments in a long revision phase. These phases result in a suitable learning material that can be considered suitable for the learning outcomes, which is beneficial to education.

III. Methodology

A. Research Question

The research aims to answer the following question:

What steps can be applied to propose a self-learning kit?

B. Participants

The participants of this study are divided into two groups. The first group is involved in the learners' data analysis in the research methodology. The researcher chose one hundred students' exam papers from a selected university in Jordan to investigate the learners' errors and understand their needs, which will form the basis of the proposed learning material. Those learners enrolled in a communication skills course. Their levels were similar due to the requirements for enrolling in such a course, which required a GPA higher than 2.0. This step is supported by the students' teachers from the same semester to provide a deeper understanding of the learners' needs. The second group is involved in the validity step where the researcher chose another communication skills class from the same university to apply the proposed learning material to find out the difficulty and discrimination indices, which are a main step in proposing learning materials.

C. Instrument

The initial instrument is university exam papers, which were used in the needs analysis step. Other instruments vary based on the phases followed in the methodology.

D. Data Collection and Study Procedures

As stated by Gall et al. (2003), different steps can be followed to ensure the suitability of the proposed learning material starting with the needs analysis step and ending with the application of the readability level. The diagram below clarifies these steps:

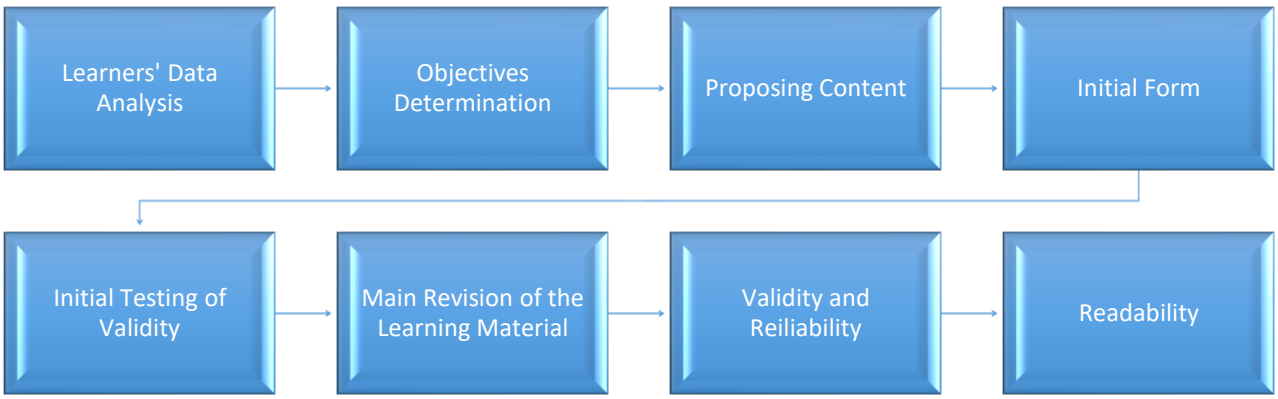

Figure 1. Gall, Gall and Brog (2007): Phases of Research & Development Conceptual Framework

IV. Results and Discussion

Step 1: Learners' Data Analysis

The need for needs for analysis or assessment is the foundation of designing any effective learning material because it is based on the learners' needs (Jalabneh, 2001). This step is essential for identifying and determining the learners' gaps and investigating their needs to address obstacles in learning (Irfadila & Noprika, 2022). This step serves as the initial step in formulating the learning objectives based on the gathered data for the analysis step. Additionally, it provides teachers with a clear path regarding what learners should be able to do after the learning practice (Al-Janaydeh & Dheif, 2022; Alsaifi, 2024).

The sources of the needs analysis data vary and can include information from teachers and from the students' records of previous exams. This data should be analyzed to determine students' needs based on their errors. These errors form the basis for sitting the objectives of the new learning material, which are addressed in the second step, as shown in the table below marked with (*), referring to the most frequently committed errors and those recommended by the teachers. Moreover, interviews with teachers add further value to the collected data from the students' results and help prioritize the most common errors made by learners.

The researcher analyzed one hundred exam papers from students over one semester to identify the types of errors committed by those students, numbered from one to eight as shown in Table 1 below. The researcher presented these error types to the four teachers who taught the selected students in the same semester. The teachers were asked to rank the importance of these error types based on their teaching experience and perspectives.

TABLE 1
SYNTACTIC ERRORS COMMITTED BY THE STUDENTS AND BY TEACHERS

Areas of Syntactic Errors	Number of Students' Errors	Level/Rank	Teachers' Perceptions	Level/Rank	Average Rank
Using verbs to be and to have	145	1	24	1	1*
Using SVO pattern	90	4	41	4	4
Using The Articles	95	3	39	3	3*
Using Prepositions	85	5	43	5	5
Using Past and Present Tenses	25	7	46	6	7
Using Conjunctions	35	6	69	8	7
Subject-Verb Agreement	100	2	31	2	2*
Using Modals	15	8	62	7	8

1= Most Errors / 8= Least Errors / * Selected Content of the Self-learning Kit

As shown in the table, the students committed eight types of errors, labeled as: Using verbs 'Be' and 'Have', Using Subject-Verb-Object Pattern, Using the Articles, Using Prepositions, Using Past and Present Tenses, Using Conjunctions, Subject-Verb Agreement, and Using Modals). These types were ranked based on the number of errors committed statistically. Then, each teacher ranked the same types from one to eight based on their importance from their own perspective. Finally, both rankings were computed to show the average ranking of the collected data. The top three rankings were selected to determine the components of the proposed self-learning kit.

Step 2: Objectives Determination

The second stage in designing the learning materials is determining the objectives that should be covered in the proposed learning material (Jamil, 2020). These objectives should be designed based on Bloom's Taxonomy to achieve the desired course outcomes. As stated by Al Qaralleh et al. (2024) and Al-Shallakh (2024), outcomes are good indicators to the achievement of the desired goals. Adithan (2015) stated that Bloom's Taxonomy is a model used to categorize objectives of learning by levels of complexity and specificity. It was formed to outline and clarify how learners acquire new knowledge and skills.

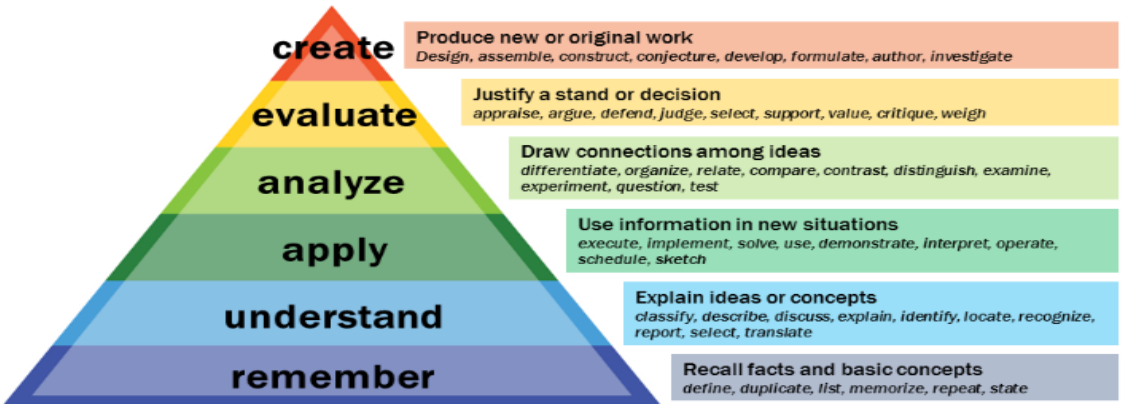

Figure 2. Anderson and Krathwohl (2001): Blooms' Taxonomy

In designing the proposed self-learning kit, these objectives should be stated at the beginning of each unit/chapter and each lesson. Additionally, a two-way chart called the 'Table of Specifications' should be created to ensure the balanced distribution of the objectives and activities across the lessons, effectively meeting the intended goals.

As stated earlier, this paper presents a sample of each step in designing a self-learning material, which includes a pre-test and a post-test for each unit, in addition to the content of the included learning material. These activities, along with both test items (pre-test and post-test) items, should be balanced with the objectives. To determine weight the activities, the equation (sum of activities divided by the sum of all items in the activities by 100%) is applied. This step also helps in determining the weight of activities within the learning material and the item weights in both tests for each lesson, as clarified in Table 2:

TABLE 2
CONTENT DISTRIBUTION BASED ON THE OBJECTIVES

Chapter	Chapter One: Syntax		
Lessons	1	2	3
Areas	Verb To Be	SVO Agreement	The Articles
Objectives	3	3	3
Pre-test	15	15	15
Input	6	6	6
Activities	6	6	6
Post-test	15	15	15

The previous table shows the distribution of objectives in balance with and relation to the content of the chapter in the proposed learning material. It is observed that the number of objectives is balanced with all other items: the number of pre-test questions, input topics, activities, and post-test questions. Implementing this step ensures that the content of each section is proportionate to its objectives. For example, three objectives correspond to fifteen pre-test questions, six input topics, six activities, and fifteen post-test questions. In other words, each objective is addressed by five pre-test questions, two inputs, two activities, and five post-test questions.

Step 3: Proposing the Content

This step is the most comprehensive, as it involves formulating the proposed learning material content in alignment with the objectives and other components of the material. The proposed learning material should be designed according to established guidelines that show the necessary components and elements (Madariaga et al., 2021). These guidelines determine how the content is presented, including the number of pages per chapter, the uniformity of activities, the presentation method of them, the language of the instructions, the page size, the font size of each part, the expected duration to complete the selected content, and the time allocated for reviewing the content of the learning material.

Step 4: Initial Form

This step is also important and supplements the previous step in forming and evaluating the new learning material. This stage involves obtaining feedback from experts in the field of learning material design (Nathenson & Henderson, 2017). The experts assess the content of the learning material and its suitability in meeting the proposed objectives. The experts also evaluate the characteristics of the proposed learning materials. For instance, a self-learning material should be self-directed, self-explanatory, self-contained, self-motivated, self-evaluative and ultimately self-learning.

Step 5: Initial Testing of Validity

After checking the characteristics of the proposed learning material and receiving approval from the experts, it is time to conduct the initial validity test to determine whether the proposed learning material is designed for its intended purpose. This validation process consists of two sub-steps, which are carried out by the experts:

A- Face validity

B- Content validity

Face validity involves experts reviewing the format and structure of the learning materials to ensure that they meet the intended objectives. They also assess whether the materials accurately measure what they are intended to measure. The second process, known as content validity, involves examining the number and structure of activities, exams, questions, and input exercises within the materials. It assesses how well the materials cover the full range of the concept being measured, including a review of the tables of specifications for the activities, pre-tests, and post-tests (Logan et al., 2021).

The validation process is crucial when designing learning materials, as it allows researchers to gauge reactions to the new resource and determine whether it meets the identified needs. The mean average helps determine the acceptance of the elements of the proposed learning material. A copy of the proposed material along with an evaluation questionnaire, is sent to several experts. The evaluation of different components is collected, and the results are used to assess whether the characteristics are considered fair or poor, with average and above being deemed acceptable. The table below provides a sample of the evaluation criteria for the face-validity process.

TABLE 3
FACE VALIDITY

Section One – Format of Chapter One (pages 2-72)					
	Poor	Fair	Average	Good	Excellent
1.Content in a logical order	1	2	3	4	5
2.Organization of content and layout	1	2	3	4	5
3.Readability of the text	1	2	3	4	5
4.Appropriate grammar and vocabulary	1	2	3	4	5
5.Use clear pictures and colors	1	2	3	4	5
Section Two – Content of Chapter One (pages 2-72)					
6. Activities in the kit are enough.	1	2	3	4	5
7. Scope and content are appropriate	1	2	3	4	5
8. Relevance of the content	1	2	3	4	5
9. Clear instructions before activities	1	2	3	4	5
10. Overall content quality	1	2	3	4	5

To evaluate the effectiveness of the proposed self-learning material, it is essential to conduct a thorough validity test. This step is considered the deeper way of measuring the components of the designed self-learning material by applying the table of specifications that describes the topics that should be covered in the activities, as well as both pre- and post-tests in a step later. The Table of Specification classifies the domains measured and ensures a fair representation of questions appearing in the tests. It also helps teachers conduct tests and see how these questions focus on the key areas and their weight to the lessons' objectives based on their importance.

To modify a Table of Specification (ToS) effectively, it is crucial to understand that improving validity depends on the specific evaluation context. The term validity refers to the level to which teachers' evaluations of students are reliable and trustworthy based on the gathered evidence (Kukwi & Galle, 2023). Table 5 below outlines the content of the Specification Table for the activities in the proposed Self-learning Kit.

To determine the weight of the activities, the following formula was implemented: (sum of items in the activities ÷ total number items in all activities of the lesson by 100%). In this lesson, there are 48 items in activities. To calculate the weight of each activity, the researcher divided the number of the items of the activity by the total number of the activities in the entire lesson, and then multiplied the results by 100 to obtain the percentage weight, as clarified at the top of the equation column. The percentages demonstrate a consistent ratio, indicating that the activities are well-organized and aligned with the lesson objectives.

The same process was applied to all lessons in the chapter. The percentage column serves as the judgment criterion, reflecting the relative importance of each activity within the content of its corresponding lesson and objectives.

TABLE 4
ACTIVITIES OF THE SELF-LEARNING KIT

Chapter	Lessons	NO. of Objectives (ILOs)	Activities (AC)	Number of Items in the Activity	Equation (sum items over sum of items in ACs×100)	Percentage
Chapter One: Syntax	1	3	1	10	10/48×100	20.8%
			2	7	7/48× 100	14.6%
			3	7	7/48 × 100	14.8%
			4	10	10/48×100	20.8%
			5	7	7/48 × 100	14.5%
			6	7	7/48 ×100	14.8%
	Total			48		100%
	2	3	1	7	7/21×100	33.3%
			2	7	7/21×100	33.3%
			3	7	7/48× 100	33.3%
	Total			21		˜100%
	3	3	1	10	10/27×100	37%
			2	10	10/27× 100	37%
			3	7	7/27×100	26%
	Total			27		100%

The Table of Specifications below was designed to measure whether the questions in the pre-tests and post-tests align with the lesson's objectives. It was used to identify the achievement areas being measured and to guarantee that the assessments were constructed in accordance with the objectives and maintaining a balanced focus on each part. Its purpose was to ensure a strong correlation between what was taught and what was assessed. The researcher developed this table to evaluate the validity of the Self-learning kit. This step involves assessing the weight of both test questions in relation to their objectives. This is also called the Table of Specifications for the pre-test and post-tests.

TABLE 5
TOS OF THE ACTIVITIES

Chapter	Lessons	Objectives	Pretest Questions	Total	Percentage	Posttest Questions	Total	Percentage
one	one	Objective 1	1-3-5-7-8	5	33.33%	3-5-9-10-15	5	33.33%
		Objective 2	2-4-6-11-15	5	33.33%	1-2-4-18-19	5	33.33%
		Objective 3	9-10-12-13-14	5	33.33%	6-7-8-11-13	5	33.33%
	two	Objective 1	3-4-7-9-12	5	33.33%	1-4-8-9-11	5	33.33%
		Objective 2	8-10-11-13-15	5	33.33%	3-5-7-12-13	5	33.33%
		Objective 3	12-5-6-14	5	33.33%	2-6-10-15-17	5	33.33%
	three	Objective 1	2-6-10-12-15	5	33.33%	5-7-9-12-16	5	33.33%
		Objective 2	7-9-11-13-14	5	33.33%	2-3-4-8-11	5	33.33%
		Objective 3	1-3-4-5-8	5	33.33%	1-6-10-13-14	5	33.33%

Step 6: Main Revision of the Learning Material

Based on the experts' feedback regarding format, content, and construct validity, the proposed self-learning material underwent significant revisions. This step is the initial major revision that incorporates the suggested changes (Abdalla, 2013).

Step 7: Validity & Reliability

Construct validity ensures that the measurement method accurately reflects the construct the researcher intends to measure (AlSmadi & AlNasraween, 2022). This is achieved by verifying that the measurements are based on relevant existing knowledge, can help determine this. By examining the Discrimination Indices and Difficulty Index of both internal and external groups, we can assess how well the construct is operationalized in real-world settings. It is important to mention that this guidance is applied only the internal group due to the size of the paper's word limitations. For the external group indices, the same calculations can be used on another group not related to the students in the internal group.

TABLE 6
RELIABILITY TEST

Type of Test	Group	/Indexes
Reliability Test	Internal Group	Discrimination Index
		Difficulty Index
	External Group	Discrimination Index
		Difficulty Index

The index tables are designed to align course objectives, lesson topics, time allocations, and chapter topics, ensuring coherence between what is taught, assessed, and the appropriate level of difficulty for students. These tables serve as a valuable link between the learning objectives, teaching process, and assessment/testing process. In other words, they measure how effectively each test item differentiates between knowledgeable and less knowledgeable students.

This process of evaluating the discrimination indices is applied to the self-learning kit activities and the pre- and post-tests for each lesson, ensuring alignment between the assessment questions and the intended learning objectives. The discrimination index was calculated for both pre-test and post-test items:

1. Learners took the pre-test, then went through the lesson, and finally took the post-test.
2. Researcher collected results and organized them from highest to lowest scores.
3. To calculate the discrimination index, the researcher selected the top 25% of scores (upper group, UG) and the bottom 25% of scores (lower group, LG).
4. The discrimination index formula used was: (UG - LG) / n, where:
   - UG = NO. of students in the upper 25% group who answered the item correctly
   - LG = NO. of students in the lower 25% group who answered the item correctly
   - n = total number of students in the upper and lower groups
5. The resulting discrimination index values were then classified according to the guidelines provided by Ebel and Frisbie (1986). Then the results are distributed based of the scale below:

TABLE 7
INDEX OF DISCRIMINATION

Index of Discrimination Scale	Interpretation
0.40 and above	Very Good Item
0.30-0.39	Reasonably Good Item (subject for Improvement)
0.20-0.29	Marginal (for Improvement)
0.00-0.19	Poor Item (to be Rejected or Revised)

The following is an example taken from a proposed self-learning kit applied to a small group of twenty students who sat for the test and received the results based on their performance:

TABLE 8
PRACTICAL PRE-TEST EVALUATION

Pre-test Evaluation / Chapter One					
Number of Questions	Upper (U) 25%	Lower (L) 25%	Total (U-L)	Index of Discrimination Total (U-L) ÷10	Interpretation Scale
1	5	4	1	0.1	Poor
2	5	3	2	0.2	Marginal
3	5	1	4	0.4	Very Good
4	4	0	4	0.4	Very Good
5	3	1	2	0.2	Marginal
6	5	2	3	0.3	Reasonably Good
7	3	3	1	0.1	Poor
8	5	1	4	0.4	Very Good
9	5	2	3	0.3	Reasonably Good
10	4	0	4	0.4	Very Good
11	3	0	3	0.3	Reasonably Good
12	5	2	3	0.3	Reasonably Good
13	5	1	4	0.4	Very Good
14	4	2	2	0.2	Marginal
15	3	1	2	0.2	Marginal
Pre-test Evaluation / Chapter One					
1	4	2	2	0.2	Marginal
2	3	3	0	0.0	Poor
3	4	3	1	0.1	Poor
4	5	2	3	0.3	Reasonably Good
5	4	1	2	0.2	Marginal
6	3	1	1	0.1	Poor
7	4	3	1	0.1	Poor
8	4	2	2	0.2	Marginal
9	5	4	1	0.1	Poor
10	3	1	2	0.2	Marginal
11	4	4	0	0.0	Poor
12	3	1	2	0.2	Marginal
13	5	1	4	0.4	Very Good
14	4	2	2	0.2	Marginal
15	5	1	4	0.4	Very Good

Based on the interpretation scale, questions that show poor performance will be revised and restructured to meet the related objective and address the issue of not aligning with intended learning objectives.

To determine the level of difficulty test items, the difficulty index measurement is applied. It evaluates high and low scores. The item difficulty index is calculated for the pre-test and post-test items:

1. The test results were organized from highest to lowest scores.
2. To calculate the difficulty index, the researcher selected the top 25% of scores (upper group, UG) and the bottom 25% of scores (lower group, LG).
3. The difficulty index formula used was: (UG + LG) / n, where:
   - UG = NO. of students in the upper 25% group who answered the item correctly
   - LG = NO. of students in the lower 25% group who answered the item correctly
   - n = total number of students in the upper and lower groups
4. The resulting difficulty index values were then classified according to the guidelines provided by Ebel and Frisbie (1986).

This analysis of item difficulty helped the researcher evaluate how challenging each test item was for the students, which is another important aspect of validating the assessment. Combining the discrimination index and difficulty index analyses provides comprehensive validation of the test items.

TABLE 9
INDEX OF DIFFICULTY

Index of Difficulty Scale	Interpretation
0.81 and above	Very Easy
0.61-0.80	Easy
0.41-0.60	Average
0.21-0.40	Difficulty
0.20 and below	Very Difficulty

The following is an example taken from a proposed self-learning kit applied to a small group of twenty students:

TABLE 10
PRACTICAL PRE-TEST EVALUATION

Pre-test Evaluation / Chapter One					
Number of Questions	Upper (U) 25%	Lower (L) 25%	Total (U+L)	Index of Difficulty Total (U+L)÷10×100	Interpretation Scale
1	5	4	9	90	Very Easy
2	5	3	8	80	Easy
3	5	1	6	60	Average
4	4	0	4	40	Difficult
5	3	1	4	40	Difficult
6	5	2	7	70	Easy
7	3	3	6	60	Average
8	5	1	6	60	Average
9	5	2	7	70	Easy
10	4	0	4	40	Difficult
11	3	0	3	30	Difficult
12	5	2	7	70	Easy
13	5	1	6	60	Average
14	4	2	6	60	Average
15	3	1	4	40	Difficult
Pre-test Evaluation / Chapter One					
1	4	2	6	60	Average
2	3	3	6	60	Average
3	4	3	7	70	Easy
4	5	2	7	70	Easy
5	4	1	5	50	Average
6	3	1	4	40	Difficult
7	4	3	7	70	Easy
8	4	2	6	60	Average
9	5	4	9	90	Very Easy
10	3	1	4	40	Difficult
11	4	4	8	80	Easy
12	3	1	4	40	Difficult
13	5	1	6	60	Average
14	4	2	6	60	Average
15	5	1	6	60	Average

Based on the interpretation scale, questions that are deemed very difficult will be revised and restructured to improve clarity and alignment with intended learning outcomes. This process will be applied in steps to both the initial group of participants and the larger group after necessary modifications have been made to ensure that all items fall within the average difficulty range.

After completing the evaluations of the Self-learning Kit in the previous steps, it was time to test its reliability. Reliability is defined as the instrument's consistency in producing the same result in repeated measurements. In the referenced study, the researcher mentioned that reliability testing was applied to the exam created by the teacher for their students. To compute the test reliability, the researcher implemented the Kuder-Richardson 20 (KR-20) formula.

The KR-20 formula is a commonly used method for estimating the internal consistency reliability of assessments, particularly for tests with dichotomous (right/wrong) scoring. It provides a reliability coefficient that indicates how consistently the test measures the intended construct. By applying this reliability testing using the KR-20 formula, the researcher could determine how consistently the Self-learning Kit assessments measured student learning, which is an important quality indicator for the instructional materials.

The process of testing the reliability of the proposed Kit's assessments started by first finding the discrimination index and difficulty index for the test items, as described in the previous steps. Reliability was then predicted by finding the correlation between both tests' scores, with the researchers applying the Spearman-Brown methodology to estimate the reliability based on the internal structure of the tests.

Testing the reliability of the Self-learning Kit's assessments using the KR-20 formula:

KR-20 = (k over (k-1)) * (1 – Σpjqj over σ2)

Specifically, the researchers utilized the Kuder-Richardson 20 (KR-20) formula, which is a commonly recommended approach for assessing the internal consistency of reliability of assessments. By following this systematic process, the researchers determined the reliability of the assessments used in the Self-learning Kit, providing a measure of how consistently the tests evaluated student learning. This reliability analysis complemented the earlier validity assessments conducted on the instructional materials.

The coefficient ranges between 0 and 1.0 is the value of measuring reliability, where “0” means no reliability while “1” means perfect reliability. Moreover, if the reliability of a test is above 0.7, it indicates good reliability; if the test is below 0.5, it means the test is not reliable.

TABLE 11
RELIABILITY SCALE

Reliability	Interpretation
0.00 to 0.20	Negligible correlation
0.21 to 0.40	The low or slight correlation
0.41 to 0.70	A marked or moderate relationship
0.71 to 0.90	High correlation
0.91 to 0.99	Very High correlation
=1.00	Perfect correlation

Below is an example from the proposed self-learning kit, applied to a small group out of twenty students:

TABLE 12
PRACTICAL EXAMPLE OF RELIABILITY

Chapter	Test	Item Number	Difficulty Index (Pi)	Quality Improvement (Qi)	Pi × Qi
Chapter one: Syntax	Pre-test	1	0.9	0.1	0.09
		2	0.8	0.2	0.16
		3	0.6	0.4	0.24
		4	0.4	0.6	0.24
		5	0.4	0.6	0.24
		6	0.7	0.3	0.21
		7	0.7	0.3	0.21
		8	0.6	0.4	0.24
		9	0.7	0.3	0.21
		10	0.4	0.6	0.24
		11	0.3	0.6	0.18
		12	0.7	0.3	0.21
		13	0.6	0.4	0.24
		14	0.6	0.4	0.24
		15	0.4	0.6	0.24
	Post-test	1	0.6	0.4	0.24
		2	0.6	0.4	0.24
		3	0.7	0.3	0.21
		4	0.7	0.3	0.21
		5	0.4	0.6	0.24
		6	0.3	0.7	0.21
		7	0.7	0.3	0.21
		8	0.6	0.4	0.24
		9	0.9	0.1	0.09
		10	0.4	0.6	0.24
		11	0.8	0.2	0.16
		12	0.4	0.6	0.24
		13	0.6	0.4	0.24
		14	0.6	0.4	0.24
		15	0.6	0.4	0.24

The last step was testing the reliability, which depended on the previous steps' data to determine the internal consistency of both internal and external groups to measure how well the tests address different constructs and provide reliable scores. Data from the discrimination indexes and difficulty levels of both groups of learners were used to calculate the Piqi (Portion of correct items times incorrect items). The results of Perceptual Image Quality Index (PIQI) were used to calculate the standard deviation of the internal consistency. As a final point, the results from the previous tables were used to determine the correlation of each group's internal consistency using Richardson's formula (KR-20).

Starting with the first chapter of the internal group of 20 students, the results show the tests' inter-consistency. The table above shows the correlation results of the tests using the KR-20 formula. The correlation results of the pretest and the post-test of the first lesson are 0.82 and 0.78, which denote a high level reliability. The results for the second lesson are 0.71 and 0.77 for the pre-test and the post-tests, which also denotes a high level of reliability. The results for the last lesson are similar to those of the second lesson, with values of 0.72 and 0.74, which can also be interpreted as a high level of reliability. Hence, the results of all tests in Chapter One of the internal group are reliable, showing a high level of consistency and reliability.

TABLE 13
INTER-CONSISTENCY OF THE INTERNAL GROUP OF THE FIRST CHAPTER

Chapter	Lesson	Test	Mean	SD	KR-20	Interpretation of Correlation
One	One	Pre-test	7.20	14.91	0.82	High Relationship
		Posttest	12.25	6.89	0.78	High Relationship
	Two	Pre-test	7.00	9.30	0.71	High Relationship
		Posttest	9.90	9.20	0.77	High Relationship
	Three	Pre-test	5.15	7.72	0.72	High Relationship
		Posttest	4.34	4.34	0.74	High Relationship

The final part of the methodology is to discover the significant correlation after applying the proposed material to the students in real-world condition. The researcher relied on ANOVA to analyze the students' performance in all sections of the learning material by comparing and contrasting the means of the students' evaluation and calculating the F-value to determine the significance for the entire regression.

TABLE 14
CORRELATION OF LESSON ONE FROM CHAPTER ONE

Chapter One / Lesson One					
Source	SS	DF	MS	F Value	Decision
Between Treatment	376+498=872	100-1=99	872÷1=872	872÷8.93=*97.6	
Within Treatment	876	99-1=98	876÷98=8.93		
Total	1748	99			Significant and accepted

- Correlation is significant at 0.05 level of (3.94)
- Correlation is significant at 0.01 level of (6904)

The data in the table show a significant at the 0.05 level and a correlation of 3.94 and a correlation of 6.90 at the 0.01 level. Students who used the first lesson of the Self-learning Kit to learn about verbs 'to be' and 'to have' found it helpful in improving their knowledge and performance in this syntactic aspect of the language. In other words, if students are required to address their syntactic issues, they might use the proposed learning material.

TABLE 15
CORRELATION OF THE SECOND LESSON OF CHAPTER ONE

Chapter One / Lesson Two					
Source	SS	DF	MS	F Value	Decision
Between Treatment	548+544=1092	100-1=99	1092÷1=1092	1092÷8.57=*127.4	
Within Treatment	840	99-1=98	840÷98=8.57		
Total	1896	99			Significant and accepted

- Correlation is significant at 0.05 level of (3.94)
- Correlation is significant at 0.01 level of (6904)

The second lesson also showed a significance correlation of 3.94 at the 0.05 and 6.90 at the 0.01 of, which referred to the students who used the second lesson of chapter one of the Self-learning Kit to enhance their syntactic performance in using subject-verb agreement. They found it to be a suitable and valuable tool that met their needs.

TABLE 16
CORRELATION OF THE THIRD LESSON OF CHAPTER ONE

Chapter One / Lesson Three					
Source	SS	DF	MS	F Value	Decision
Between Treatment	550+656=1206	100-1=99	1206÷1=1206	1206÷7.44=*162.0	
Within Treatment	730	99-1=98	730÷98=7.44		
Total	1936	99			Significant and accepted

- Correlation is significant at 0.05 level of (3.94)
- Correlation is significant at 0.01 level of (6904)

The last lesson of chapter one also showed a significant correlation of 3.94 at the 0.05 level and 6.90 at the 0.01 level. This referred to the students who used this lesson of the Self-learning Kit to enhance their syntactic performance in using the articles and found it to be a suitable and useful learning material that met their need.

Step 8: Readability

The last step in this process is testing the readability of the tests. The readability tool is a quick and easy way to assess the readability of a written work. It is used to ensure the test is within the average level of the learners. Flesch-Kincaid uses a scale from 1 to 100 to assess the test's readability level. The researcher followed the Flesch Reading Ease Formula (1948), which is expressed as follows:

= 206.835-846(syllables over words) - 1.015 (words over sentences)

TABLE 17
READABILITY SCALE

Score	Interpretation
100-91	Very easy to read
90-81	Easy to read
80-71	Fairly easy to read
70-61	Standard plain English
60-51	Fairly difficult to read
50-31	Difficult to read
30-0	Very difficult to read

The Table below shows the measurements of readability of both tests of the Self-learning Kit. All tests scored averages ranging between very easy to read and standard level of readability. Two tests were the easiest (readability score = 92), and one test, with a score of 64, was at the highest level of readability within the standard level. The four tests were ranked in the easy level range with readability scores of 83, 85, 89 and 89. Finally, seven tests were considered easy to read, with scores ranging from 74 to 79. On the other hand, none of the tests scored at a difficult readability level, which are considered suitable for the learners' levels to be read within their range.

TABLE 18
TESTS OF READABILITY

Chapter	Lesson	Type of Evaluation	Formula	Readability Level
Chapter One	Lesson One	Pre-test	RE= 206.835 - (1.015×$\frac{87}{15}$) - (84.6×$\frac{125}{87}$) = 79	Fairly Easy
		Post-test	RE= 206.835 - (1.015×$\frac{154}{20}$) - (84.6×$\frac{227}{154}$) = 74	Fairly Easy
	Lesson Two	Pre-test	RE= 206.835 - (1.015×$\frac{134}{15}$) - (84.6×$\frac{172}{13487}$) = 89	Easy
		Post-test	RE= 206.835 - (1.015×$\frac{165}{20}$) - (84.6×$\frac{212}{164}$) = 89	Easy
	Lesson Three	Pre-test	RE= 206.835 - (1.015×$\frac{117}{15}$) - (84.6×$\frac{173}{117}$) = 74	Fairly Easy
		Post-test	RE= 206.835 - (1.015×$\frac{151}{20}$) - (84.6×$\frac{208}{151}$) = 83	Easy

V. CONCLUSION

This research demonstrates a systematic approach to designing and implementing effective learning materials tailored to learners' specific needs in syntax. By following the outlined steps, teachers can enhance the quality of their instructional materials and bridge the learning gap. The practical application and statistical analysis presented in this paper offer a valuable source for educators seeking to improve learner performance and foster a more engaging and effective learning environment.

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