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Kotobee-Based Interactive Learning Modules in Improving Grammar Competencies

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Abstract
This study investigated the effectiveness of Kotobee-based English learning modules in enhancing grammar competencies among 25 Grade 6 learners at Anomar Elementary School, Surigao City, Philippines. Employing a One Group Pretest-Posttest design, the study utilized pre- and post-tests focusing on verb tenses, conjunctions, and adverbs. Data were analyzed using descriptive statistics and the Wilcoxon Signed-Rank Test. Findings revealed that pre-intervention, pupils were "Less Competent" in verb tenses and adverbs, and "Not Competent" in conjunctions. Post-intervention, they advanced to "Competent" in verb tenses and adverbs, and "Less Competent" in conjunctions. The modules' development followed a systematic process, aligning with DepEd MELCs and requiring Kotobee Author expertise. Crucially, a significant difference and mean gain were observed in overall grammar competency before and after module use. The study concludes that Kotobee-based interactive learning modules effectively improved Grade 6 pupils' grammar competence, particularly in verb tenses and adverbs, demonstrating a positive, statistically significant impact on their learning outcomes. While improvement for conjunctions was noted, further intervention might be beneficial for achieving higher mastery.

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Keywords: Kotobee-Based, Learning Modules, Grammar, Pre-Test-Posttest, Verb Tenses, Conjunction, Adverb

Introduction

The technological evolution in the 21st century effectively changed the way students learn in almost every field but especially in the field of language teaching and learning.

Across different education systems, digital learning tools have been widely adopted to boost students' engagement, understanding, and academic performance (Selwyn, 2017) [33]. One of these tools is Kotobee. It is a suite of tools that allows users to create, publish, and deliver interactive ebooks and digital learning materials. It's particularly focused on rich, engaging content that goes beyond traditional static text. A Kotobee Author is the primary software for creating interactive ebooks. It allows users to embed various multimedia elements like videos and audio, interactive images, 3D objects, quizzes and assessments with real-time feedback, widgets and other interactive elements which supports importing content from various formats like PDF, Word, HTML, and EPUB, and can export ebooks to multiple formats, including EPUB, MOBI, PDF, HTML, and standalone desktop or mobile apps (kotobee.com).

The Kotobee-based interactive learning modules provide interactive e-books, quizzes, and multimedia components that support active language acquisition and learning. As the demands on educators change, especially regarding digital literacy, and student-centered learning, it becomes relevant to explore the role that these tools have in supporting learners in improving grammar competencies. Hockly (2012) [15] emphasized that there are researches that explored how educational technology can play a role in the learning of languages, the majority of the research is directed towards higher education and professional training.

Moreover, no empirical studies have examined the effectiveness of Kotobee in the field of elementary education, especially in enhancing the grammar competencies of elementary learners. In addition, the Philippine educational system must grapple with its own issues when it comes to integrating technology in classrooms, such as unequal and limited access to digital technologies and uneven digital literacy among students and teachers (Alipio, 2020) [6]. Bridging this gap is important to knowing how Kotobee-based interactive learning modules influence students' language development in basic education.

The study intends to evaluate the effectiveness of Kotobee-based interactive learning modules in improving grammar competencies among Grade 6 learners of Anomar Elementary School, Anomar, Surigao City, Philippines.

Problem Statement

This study aimed to assess the effectiveness of integrating Kotobee-based English learning modules in enhancing the grammar competencies of Grade 6 learners. Specifically, it sought to evaluate participants' grammar skills in verb tenses, conjunctions, and adverbs, comparing their pretest and post-test results. The study also examined how the Kotobee-based interactive modules were developed and utilized in the classroom to improve learners' grammar competencies.

Methods

Research Design

This study adopts a One Group Pre-test-Posttest research design to evaluate the effectiveness of integrating Kotobee-based English learning modules in improving grammar competencies among Grade 6 learners.

Research Environment

The study was conducted at Anomar Elementary School, situated in Brgy. Anomar, Surigao City, Philippines. The school has a population of 240 students and nine teachers, all under the leadership of a principal. It is part of the Department of Education's division in Surigao City, serving as a key educational institution in the area.

Participants

The participants of this study were the 30 Grade 6 pupils of Anomar Elementary School in Brgy. Anomar, Surigao City, Caraga Region, Philippines. They are chosen because Grade 6 learners are at a crucial stage where they refine their grammar abilities in preparation for secondary education. They can navigate e-learning platforms like Kotobee, process multimedia content, and apply digital resources to enhance their grammar competencies. Moreover, Grade 6 students are often more receptive to interactive and game-based learning, which Kotobee offers through its multimedia features.

Research Instrument

The primary research instruments for this study included lesson plans, Kotobee-based interactive learning modules, and pretest and post-test assessments focused on verb tenses, conjunctions, and adverbs. The content of the Kotobee modules was based on existing Grade 6 English grammar modules from the Department of Education (DepEd), ensuring alignment with national curriculum standards. The development process involved importing DepEd module content into Kotobee Author, organizing it into chapters, and incorporating grammar explanations, images, videos, quizzes, and interactive features. The modules were optimized for various devices and exported in multiple formats for distribution. To ensure content validity, lesson plans were assessed for their ability to meet objectives, and the items in the tests and modules were validated through DepEd's pre-existing processes.

Ethics and Data Gathering Procedure

The research was conducted with respect for the participants' rights and privacy. Permission was obtained from the Schools Division Superintendent and the School Principal of Anomar Elementary School. Participants, including Grade 6 learners, their parents or guardians, and teachers, were informed about the study, and written consent was obtained from parents or guardians. Data collection began after consent, with pre-tests administered before lessons on verb tenses, conjunctions, and adverbs. Kotobee-based learning modules were used to teach English grammar, and post-tests followed each topic to assess changes in grammar competency. The data from both pre- and post-assessments were then compiled and analyzed.

Data Analysis

To analyze the data, various statistical tools were used, including Mean, Standard Deviation, and Percentage to summarize the pretest and post-test scores. The Wilcoxon Signed Rank Test, a non-parametric test, was applied to evaluate paired data and determine whether significant changes occurred between pre-test and post-test scores following the intervention.

Results and Discussion

The following section presents the detailed analysis of the study conducted to evaluate the impact of Kotobee-based English learning modules on the grammar and writing competencies of the respondents.

Level of Grammar Competencies Before and After Using the Kotobee-Based Interactive Learning Modules in Terms of Verb Tenses, Conjunctions and Adverbs

Table 1 presents the pretest and postest results of the participants' grammar and writing competencies before using the Kotobee- based English learning modules. The table includes data on verb tenses.

Table 1: Level of Grammar Competence of the Participants in terms of Verb Tenses

Topic	Pre Test			Level of Competency	Post test			Level of Competency
	Mean Score	SD	%		Mean Score	SD	%	
Verb Tenses	10.69	3.89	43%	Less Competent	18.49	4.24	74%	Competent

Score Range	Level of Competency	Description
22 – 25	Highly Competent	Demonstrates excellent mastery of verb tenses; uses appropriate tenses consistently in various contexts.
18 – 21	Competent	Shows good understanding of verb tenses; uses them correctly most of the time with few errors.
13 – 17	Moderately Competent	Shows basic understanding; can use common tenses correctly but struggles with complex structures.
8 – 12	Less Competent	Limited understanding of verb tenses; makes frequent errors and shows confusion in usage.
0 – 7	Not Competent	Lacks understanding of verb tenses; shows little to no ability to use tenses appropriately.

Table 1 presents the grammar competencies of the participants in terms of verb tenses, measured before and after the use of Kotobee-based interactive learning modules. The assessment was conducted with corresponding mean scores, standard deviations, and percentage scores converted into Likert scale descriptors of competency.

The pre-test results indicate that before the intervention, participants had a limited understanding of verb tenses. With an average score of 10.69 (43%), they fall under the "Less Competent" category. This implies frequent errors in tense usage and general confusion regarding proper application, particularly in complex grammatical structures.

Following the use of the Kotobee-based interactive learning modules, the mean score significantly improved to 18.49 (74%). This places participants in the "Competent" category. Learners in this range generally show a good grasp of verb tenses and use them correctly most of the time, with only a few minor errors.

The increase of 31 percentage points from pre- to post-test indicates a substantial gain in verb tense competency, moving two levels up the Likert scale. The interactive, digital, and learner-centered nature of Kotobee likely contributed to higher engagement, better retention, and improved grammatical understanding among learners.

This is supported by the study of Al Fadda, H., & Alblawi, A. (2020) that interactive e-books significantly improved grammar performance and motivation among EFL learners. The multimedia elements, interactive quizzes, and self-paced learning features helped students internalize grammar rules more effectively compared to traditional methods.

Table 2 presents the level of grammar competence of the participants in terms of conjunctions.

Table 2: Level of Grammar Competence of the Participants in terms of Conjunctions

Topic	Pre Test			Level of Competency	Post test			Level of Competency
	Mean Score	SD	%		Mean Score	SD	%	
Conjunctions	6.52	2.43	43%	Not Competent	11.72	3.58	78%	Less Competent

Score Range	Level of Competency	Description
22 – 25	Highly Competent	Excellent understanding, consistent, accurate use
18 – 21	Competent	Solid understanding, minimal errors
13 – 17	Moderately Competent	Basic use, occasional confusion/structural errors
8 – 12	Less Competent	Limited knowledge, frequent misuses/omissions
0 – 7	Not Competent	Little or no understanding, struggles with coherence

Table 2 presents a comparative analysis of the participants' performance in the use of conjunctions, as measured through a 20-item test. It shows the mean scores, standard deviations, and percentage equivalents in the pre-test and post-test, and interprets the levels of competency using a 5-point Likert Scale.

The pre-test results indicate that prior to the intervention, participants demonstrated a limited understanding of conjunctions. Falling within the 0-7 score range, learners were classified as "Not Competent" according to the Likert scale. This means they shows limited or no understanding, struggles with coherence. This baseline suggests a substantial deficit in their ability to correctly use conjunctions, highlighting a critical area for improvement.

The post-test mean score of 11.72 now falls within the "8 - 12" range, classifying the participants' level of competency as "Less Competent". This indicates that, after the intervention, the participants have limited knowledge and demonstrate frequent misuses/omissions." While there was a notable increase in the mean score (from 6.52 to 11.72) and percentage (from 43% to 78%), and a shift from "Not Competent" to "Less Competent," it suggests that while the modules facilitated some learning, the participants still have significant room for improvement in mastering conjunctions. They moved out of the "no understanding" category but still show "limited knowledge" and frequent errors.

The shift from "Not Competent" to "Less Competent" for conjunctions indicates that the modules did have a positive effect, pulling learners out of a state of near-total lack of understanding. The progress for conjunctions suggests that this specific grammar topic might require more intensive or varied instructional strategies within the modules, or more extensive practice, to achieve higher levels of mastery. It highlights that while the intervention was generally effective, its degree of effectiveness varied across different grammar topics.

The result of the study is supported by Yusof, M. H. M., & Saadon, N. H. (2020) [36] that e-modules improved grammar performance, especially when learners were allowed to explore lessons independently and at their own pace—an approach aligned with the features of Kotobee.

Table 3 presents the level of grammar competence of the participants in terms of adverbs.

Table 3: Level of Grammar Competence of the Participants in terms of Adverbs

Topic	Pre Test			Level of Competency	Post test			Level of Competency
	Mean Score	SD	%		Mean Score	SD	%	
Adverbs	12.92	3.16	52%	Less Competent	19.28	3.21	77%	Competent

Score Range	Level of Competency	Description
22 – 25	Highly Competent	Shows excellent mastery of adverbs; correctly identifies and uses various types of adverbs with appropriate placement in sentences.
18 – 21	Competent	Demonstrates good understanding of adverbs; uses them properly most of the time with minor errors.
13 – 17	Moderately Competent	Has basic knowledge of adverbs; can use common adverbs but may struggle with placement or variety.
8 – 12	Less Competent	Limited understanding of adverbs; frequently misuses or omits them in written and spoken language.
0 – 7	Not Competent	Lacks understanding of adverbs; rarely uses them correctly and shows confusion in function and form.

It can be seen that the Table 3 effectively illustrates the impact of Kotobee-based interactive learning modules on participants' grammar competence in adverbs. The table presents data from both a pre-test and a post-test.

Before the intervention, participants had a mean score of 12.92 (52%), classified as Less Competent. After utilizing the Kotobee-based interactive learning modules, their mean score increased to 19.28 (77%), which corresponds to the Competent level. This significant increase in mean scores and competency levels indicates that the use of interactive digital modules contributed positively to enhancing the students' understanding and application of adverbs.

A study by Al-Azzam & Al-Jarrah (2020) [3] found that students who used Kotobee and similar e-learning platforms showed significant improvement in grammar performance and motivation compared to those who used traditional methods. The interactive features, such as embedded quizzes, videos, and instant feedback, made learning more engaging and effective.

Another relevant study is by Nugroho & Mutiaraningrum (2020) [25], who emphasized that gamified and interactive e-learning tools improve learners' retention and understanding of grammar topics, particularly among secondary learners.

Creation and Implementation of Kotobee-based Interactive Learning Modules

Creating the Kotobee-based interactive learning modules requires expertise in Kotobee platform, specifically the Kotobee Author Application.

Creating of Kotobee-based Interactive learning Modules

The content of the Kotobee-based interactive learning modules were taken from the Grade 6 modules provided by the Department of Education. The lessons, activities and assessments were transferred to the Kotobee Author Application. To set up a Kotobee Author project, a suitable template was chosen. Here are the steps on how the Kotobee-based interactive learning modules being developed:

1. Import existing DepEd module content (text, images) into Kotobee Author. Kotobee allows importing from Word, PDF, HTML, or EPUB;
2. Organize the content into chapters and sub-chapters, mirroring the module's logical flow;
3. Input the core grammar explanations and examples. Use clear headings, bullet points, and appropriate fonts;
4. Insert relevant images, diagrams, or infographics. Use Kotobee's interactive image features (pop-ups, hotspots) for enhanced explanations.Embed videos demonstrating grammar concepts or showing real-life usage. Add narration for text-to-speech, pronunciation guides, or listening activities;
5. Use Kotobee's built-in quiz editor to create various question types: Multiple choice questions (single/multiple answers), Fill-in-the-blanks, Drag-and-drop (e.g., classifying words, ordering sentences), Matching questions, True/False, Set up instant feedback, scoring, and options for retries.
6. Explore Kotobee's widgets (e.g., crosswords, word searches, puzzles) to gamify grammar practice.
7. Create internal links within the module (e.g., from a quiz question to the relevant explanation) and external links to supplementary resources if needed.
8. Refine and Optimize. Ensure the modules look good and function well across different devices (desktop, tablet, mobile). Kotobee Author offers a "Smart Preview" feature for this. Optimize images and media files to reduce module size for faster loading and offline use. Apply custom branding, logo, and color schemes.
9. Export the Kotobee project to desired formats for distribution: Web App (HTML5) for online access via browser, Desktop App (Windows/Mac) for offline use on computers, Mobile App (Android/iOS) for offline use on smartphones and tablets, SCORM/xAPI if integrating with an existing Learning Management System (LMS) like Moodle, to track student progress, and EPUB for general ebook readers, though some advanced interactivity might be lost depending on the reader.

Implementation of Kotobee-based Interactive learning Modules

The instructional design and delivery for the grammar competencies of verb tenses, conjunctions, and adverbs for Grade 6 learners were systematically structured following the Department of Education's Most Essential Learning Competencies (MELCs).

Prior to the commencement of instruction for each specific grammar topic, a pretest was administered to gauge the pupils' baseline proficiency in verb tenses, conjunctions, and adverbs, respectively. This assessment was crucial for establishing their initial competency levels.

During the lesson proper, the teacher-researcher introduced the Kotobee-based interactive learning modules. Pupils were equipped with individual laptops to facilitate their engagement with these digital resources. A significant advantage of the Kotobee platform, particularly beneficial in diverse educational settings, was its offline functionality, negating the requirement for internet connectivity during module use.

The teacher-researcher provided a comprehensive orientation to the pupils on effective navigation and access within the interactive modules. Throughout the learning activities embedded within Kotobee, the teacher-researcher offered direct guidance and support, supplementing the module's content with further explanations of grammatical concepts, illustrative photographs, and embedded video demonstrations. This blended approach ensured that the interactive digital learning was augmented by direct pedagogical input and clarification.

Following the completion of each distinct grammar lesson, a post-assessment was administered. This evaluative measure was designed to ascertain the pupils' improvement in their competency levels for the respective grammar topics, allowing for a quantitative analysis of learning gains attributable to the intervention.

Significant Difference in the Grammar Competency Level of the Pupils Before and After Using the Kotobee-Based Interactive Learning Modules

Table 4 and 5 present the results of a statistical test conducted to determine if there is a significant difference in the grammar competency level of the pupils before and after using the Kotobee-based interactive learning modules. The information provided is crucial for evaluating the effectiveness of the intervention.

Table 4: Normality Test

Group	Statistic	Shapiro Wilk p	Decision
Competency level before and after using Kotobee based English	0.704	<0.001	Not Normally distributed

Table 5: Significant Difference in the Grammar Competency Level of the Pupils Before and After Using the Kotobee-Based Interactive Learning Modules

	N	Z	p-value	Decision	Interpretation
Before and After	25	0.001	<0.001	Reject Ho	There is a significant improvement, suggesting that the intervention was effective

Statistical Tool used: Wilcoxon Signed Rank Test * if p value is <0.05 then there is a significant difference

As indicated in Table 4 (Normality Test), the data for grammar competency was not normally distributed (Shapiro Wilk $p < 0.001$). Consequently, the Wilcoxon Signed-Rank Test, a non-parametric alternative suitable for comparing related samples, was employed. The test yielded a z-statistic of 0.001 and a p-value of less than 0.001 (Table 5). Since this p-value is well below the conventional significance level of 0.05, the null hypothesis was rejected, demonstrating a statistically significant improvement in grammar competency. This finding provides strong evidence that the Kotobee-based interactive learning modules were an effective instructional tool, as the observed gains are highly unlikely to be due to random chance.

Significant Mean Gain in Pre-test and Post Test Results Before and After the Implementation of Kotobee-based Interactive Learning Modules

Table 6 presents a concise summary of the overall impact of the Kotobee-based interactive learning modules on the participants' grammar competence. This table specifically highlights the gain in performance from the pretest to the post-test and provides statistical evidence of its significance.

Table 6: Significant Mean Gain in Pretest and Post Test Results Before and After the Implementation of Kotobee-Based Interactive Learning Modules

Variable	Mean	Mean Gain	z-value	p-value	Interpretation
Pre-test	51.5	35	0.001	<0.001	Learners performed better in grammar after using the modules.
Post Test	86.5				

Table 6 reveals a significant improvement in grammar competence after the implementation of Kotobee-based interactive learning modules. The pre-test mean score of 51.5, serving as the baseline, notably increased to a post-test mean of 86.5, demonstrating an average gain of 35 points. This substantial increase is statistically significant ($z = 0.001$, $p < 0.001$), indicating that the observed improvement in grammar performance is highly unlikely to be due to chance. Therefore, the data strongly supports the effectiveness of the Kotobee-based modules in enhancing learners' grammar skills. This result is supported by Yusof, M. H. M., & Saadon, N. H. (2020) [36] which stated that students who used interactive e-modules significantly improved their grammar scores compared to those who used traditional methods. The modules featured self-paced learning, immediate feedback, and integrated multimedia—features similar to Kotobee. The researchers reported that the post-test results were statistically significant, confirming the effectiveness of digital modules in enhancing grammar proficiency.

Conclusion

The study concluded that Grade 6 pupils showed significant improvement in grammar competence after using the Kotobee-based modules. Initially, students were "Less Competent" in verb tenses and adverbs and "Not Competent" in conjunctions. After the intervention, their skills improved to "Competent" in verb tenses and adverbs, and "Less Competent" in conjunctions, with conjunctions showing slower progress. The modules were developed systematically using the Kotobee Author application and aligned with the Department of Education's MELCs. Statistical analysis confirmed a significant improvement in post-test scores, indicating that the Kotobee-based modules effectively enhanced grammar competency. A substantial mean gain in scores further reinforced the modules' positive impact on learners' grammar skills.

Recommendation

Based on the study's findings, several recommendations are proposed to enhance the use of Kotobee-based English learning modules in improving grammar competencies. School administrators and policymakers are encouraged to integrate technology-based tools like Kotobee into the curriculum. Educational technology developers should continue enhancing platforms to meet varied learning needs. Teachers are advised to incorporate such tools into their teaching strategies for more engaging and effective instruction, while also monitoring student progress. Parents should support the use of these tools at home to reinforce learning. Learners are encouraged to actively engage with the modules, and future researchers should explore similar studies in different contexts and subjects to assess broader effectiveness.

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