# Integrating Digital Media in Content-Based Language Teaching for English Specific Purposes: A Study of Online Learning Platforms in Reading Comprehension

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## Abstract

This study investigates the integration of digital media in Content-based Language Teaching (CBLT) to improve reading comprehension in contexts involving English for Specific Purposes (ESP). Using a Classroom Action Research (CAR) design, the study was conducted over two cycles involving 79 undergraduate students from the Management Study Program at Universitas Bumigora. Digital media—including a Moodle-based Learning Management System (LMS), WhatsApp group discussions, and AI-generated video content–were implemented to support student engagement and content understanding. Quantitative data from pre- and post-tests revealed a significant improvement, with a mean score increase of 34.35 points ($p < .001$). Qualitative data from classroom observations indicated enhanced learner autonomy, increased peer collaboration, and better task engagement, particularly in the second cycle. The findings suggest that integrating digital platforms into ESP instruction improves comprehension and fosters student-centered learning environments. This study supports previous research on the pedagogical potential of digital media in language education and provides a practical model for embedding technology in higher education language classrooms.

**Keywords**: Content-Based Language Teaching; ESP; Digital Media; Reading Comprehension; Classroom Action Research.

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## 1. INTRODUCTION

Digital platforms used within language teaching are unavoidable, specifically within Indonesia, and further within the teaching of English for Specific Purposes (Masitoh et al., 2024). Notably, within the teaching of reading as the main component of language competence, the lecturers are required to craft the learning that is rich in the content of language and accommodating the digital technology. This change is caused by the technology adaptation in learning due to the pandemic, where the language assessment, practices, and evaluation in higher education are redefined (Alenezi, 2023; Bygstad et al., 2022).

Content-Based Language Teaching (CBLT) is a significant pedagogical direction to support these changes (Suhendra, 2023). The CBLT stands firmly on the idea that teaching and learning languages should be relevant to students' academic and professional needs, as several researchers believe that CBLT helps students to enrich

their vocabulary, understand the information, and make meaning through contextual information (Caputolan et al., 2025; Fleta, 2023; Hossain, 2024; Zarei Darabi, 2025). Nonetheless, while the conceptual foundation of CBLT is solid, there remains limited research on how this model can be enhanced through digital media, particularly in ESP classrooms where reading skill is prioritized.

Several instances of digital media integration within language learning have been proven effective, i.e., Moodle-based LMS, WhatsApp, Google Forms, and institutional e-learning portals. These platforms offer asynchronous learning, promote collaborative reading exercises, and further offer formative feedback mechanisms (Goyal et al., 2023; Nyathi & Sisimayi, 2024; Purwanto et al., 2022; Teyebi & Yaiche, 2024). Nonetheless, the framework of CBLT has high dependency on how they are instructed within the learning. Haleem et al. (2022) and Ninghardjanti and Dirgatama (2021) stated that digital media should not solely function as the medium to convey information; rather, it should be integrated into the instructional design to activate learners' critical thinking, interactions, and comprehension.

Several studies have proven the capabilities of digital media in ESP learning. Saeedi and Najjarpour (2025) for example, utilized Articulate Storyline software to teach discipline-specific vocabulary and found an enhancement in technical vocabulary learning. Bui and Macalister (2021) and Mason (2024) examined online strategies to enhance reading and writing fluency among first-year university students. Meanwhile, Belda-Medina (2021) showed that multimodal task design in digital learning environments helps foster students' cognitive and communicative competence. These studies, while valuable, tend to focus on isolated tools or skills, leaving a research gap on how integrated digital platforms can be synergized with CBLT in ESP reading instruction.

Nevertheless, the application of digital platforms in content-based pedagogy has challenges. Abedi (2024) points to the lack of alignment between technological tools and content objectives, often resulting in fragmented learning experiences. Ginting et al. (2024), Ojugo et al. (2023), and Sivri and Sahin (2021) further emphasize the need for adaptive, learner-centered systems to personalize learning pathways in response to student performance. These findings underscore the importance of designing digital-CBLT interventions that are theoretically sound and practically grounded.

Departing from this background, this study investigates how digital platforms—specifically the university's e-learning system—can be integrated into a CBLT model to improve reading comprehension in ESP classrooms. Focusing on students from the Management Study Program, the study seeks to answer the following questions: (1) How are digital media embedded in ESP reading instruction using a CBLT approach? (2) What are students' perceptions of these tools in their learning journey? (3) What is the measurable impact of this integration on students' reading performance? and (4) What pedagogical insights can be drawn from this digital-CBLT implementation?

Theoretically, this study is anchored in the dual perspectives of Content-Based Language Teaching and sociocultural learning theory. These frameworks view language learning as a socially mediated activity, emphasizing contextualization, collaboration, and meaningful input. The Technological Pedagogical Content Knowledge (TPACK) model also assesses how digital media align with language learning objectives. This study is expected to contribute to the literature on ESP and digital pedagogy and the development of practical frameworks for integrating digital media into content-based instruction in Indonesian tertiary education.

## 2.    RESEARCH METHOD

This descriptive-qualitative research uses a Classroom Action Research (CAR) design. CAR was chosen because it helps teachers solve problems in their teaching and improve their methods (Tracy, 2020). In this study, CAR followed four steps: planning, acting, observing, and reflecting. It was used to explore how digital media can be used in Content-Based Language Teaching (CBLT) to help students better understand reading texts in an English for Specific Purposes (ESP) class.

The object of this study was the Management Study Program at **Universitas Bumigora**, where English for Specific Purposes (ESP) is part of the foundational curriculum. A total of **79 undergraduate students** participated, drawn from two classes: Class A (44 students) and Class B (35). These participants reflected diverse levels

of language proficiency and learning backgrounds, yet all shared the need to master English for academic and professional purposes within the management domain. While challenging, this diversity also enriched the research process, allowing the intervention to be tested across a spectrum of learner profiles.

The researcher employed a **mixed-methods approach** to capture the complexity of instructional impact, triangulating quantitative data with qualitative insights. The tools used included:

- **Pre-test and Post-test assessments** to quantitatively measure the shifts in reading comprehension.

- **Observation sheets**, filled out during each session, to document teaching activities, student responses, and interactional patterns within the digitally supported CBLT environment.

- **A perception questionnaire**, distributed at the end of the cycles, aimed to solicit students' reflective feedback regarding the usability and impact of the digital media integrated in the classroom.

- **Semi-structured interviews**, conducted with both selected students and the instructor, to delve deeper into personal experiences, perceived benefits, and challenges encountered during the intervention.

Each of these instruments served a specific purpose, but collectively contributed to a holistic understanding of how digital integration in a content-based approach influences language learning outcomes. This methodological combination, especially in action research, not only enhances validity through **data triangulation** but also ensures that the voices of both students and instructors are heard in shaping the pedagogical narrative.

The study was implemented over **two cycles**, each consisting of **two 80-minute meetings**. In **Cycle I**, students were introduced to ESP reading texts through the university's **official Moodle-based Learning Management System (LMS)**. Tasks were scaffolded using embedded vocabulary activities, reading comprehension questions delivered via LMS, and asynchronous forum discussions facilitated through a WhatsApp Group. Instructional adjustments were made based on the observations and feedback from this first cycle. **Cycle II** featured refined materials, clearer instructional scaffolds, and more guided peer interactions, also adding reading comprehension learning through generated video using AI that is uploaded to YouTube, responding to student suggestions and the need for more structured LMS navigation.

The **reflective dimension** of the CAR model was most evident between cycles, where decisions about pedagogical modifications were rooted in evidence gathered during implementation. Such responsiveness reflects the dual role of the teacher as both facilitator and researcher—an aspect deeply aligned with the values of practitioner-led inquiry.

For the **data analysis**, quantitative results from the pre- and post-tests were processed using descriptive statistics and a **paired sample t-test** to examine the degree of score improvement. The perception questionnaires were analyzed by grouping responses into thematic categories: usability, motivation, and comprehension support. Meanwhile, the interview transcripts and observation notes were subjected to **thematic coding**, focusing on recurring ideas related to learner engagement, digital navigation, task clarity, and peer collaboration.

Through this multi-layered approach, the study not only sought to assess the **effectiveness of digital media in CBLT** but also to understand the pedagogical conditions under which these tools either support or hinder learning. The research method thus mirrors the complexity of real classroom environments, offering a grounded, evidence-based reflection on how theory and technology intersect within ESP instruction.

## 3.   FINDINGS AND DISCUSSION

This study investigated the impact of digital media integration into a Content-Based Language Teaching (CBLT) framework on students' reading comprehension in an English for Specific Purposes (ESP) class. Conducted through Classroom Action Research (CAR), the study involved a total of 79 students from the Management Study Program at Universitas Bumigora, consisting of 44 students in Class A and 35 students in Class B.

### 3.1.    Statistical Results

#### A.    Pre-Test and Post-Test Results

To assess the effectiveness of the intervention, students' reading comprehension was measured using pre-test and post-test assessments. Table 1 presents the descriptive statistics of these results.

Table 1. Paired Samples Statistics

| Pair | Mean | N | Std. Deviation | Std. Error Mean |
|------|------|---|----------------|-----------------|
| Pre-test | 59.42 | 79 | 19.51 | 2.19 |
| Post-test | 93.77 | 79 | 11.95 | 1.34 |

Students' average scores improved from **59.42** on the pre-test to **93.77** on the post-test, showing a **mean gain** of **34.35** points. A **paired sample t-test** was conducted to determine whether this improvement was statistically significant (see Table 2).

Table 2. Paired Samples Test

| Pair | Mean Difference | Std. Deviation | Std. Error Mean | t | df | Sig. (2-tailed) |
|------|-----------------|----------------|-----------------|---|----|-----------------|
| Post - Pre | 34.35 | 21.94 | 2.47 | 13.93 | 78 | .000 |

The results indicate a highly significant improvement in students' reading comprehension ($p < 0.001$), validating the effectiveness of the CBLT approach supported by digital media.

#### B.    Categorical Analysis of Post-test Scores

Students' post-test scores were grouped into defined categories further to understand the distribution of performance levels after the intervention. Table 3 summarizes the frequency and percentage of students in each score category.

Table 3. Paired Samples Test

| Interval | Frequency | Percentage (%) | Category |
|----------|-----------|----------------|----------|
| 85 – 100 | 66 | 83.54% | Very Good |
| 75 – 84 | 3 | 3.80% | Good |
| 65 – 74 | 5 | 6.33% | Fair |
| 55 – 64 | 4 | 5.06% | Poor |
| Below 55 | 1 | 1.27% | Very Poor |
| **Total** | **79** | **100.00%** | |

The distribution shows that 83.54% of students achieved scores within the "**Very Good**" category, indicating substantial gains in reading comprehension proficiency. These results support the value of digitally supported CBLT instruction in ESP learning environments.

### 3.2.    Qualitative Findings

Qualitative data were collected during the classroom intervention through observation notes, a perception questionnaire, and semi-structured interviews to complement the statistical evidence of improvement in students' reading comprehension. These tools provided insight into how students experienced the digital learning environment and how their engagement evolved across the two CAR cycles.

#### A.    Cycle I Observations

In the first cycle, students were introduced to ESP reading materials via Moodle LMS. The instructional delivery emphasized pre-class learning activities, such as watching AI-generated videos, completing vocabulary-based quizzes, and participating in asynchronous forum discussions through WhatsApp Group.

Observation data revealed that while the learning objectives and digital media were clearly provided, some students encountered difficulties navigating the LMS and completing the forum-based tasks. Group discussions were attempted in class, but participation remained uneven, often dominated by higher-proficiency learners. Scaffolding was provided, but some students still required repeated instructions or one-on-one clarification. Instructional delivery in Cycle I was rated as follows:

- **Instruction clarity**: 3 (satisfactory)

- **Relevance of materials and tasks**: 5 (excellent)

- **Transition between tasks and concepts**: 3 (satisfactory)

- **Student engagement and feedback cycle**: varied; feedback mostly reactive

These ratings indicated that while the pedagogical components were present, delivery needed refinement, particularly in improving peer engagement and LMS orientation.

### B.　Cycle II Observations

Several pedagogical modifications were made in Cycle II based on reflections from Cycle I. Instructional scaffolding was enhanced through visual guides embedded in the LMS, clearer task sequencing, and shorter, more targeted video content (7-10 minutes). WhatsApp group discussions were given more structure, including prompt questions and participation rules.

Observation results from Cycle II showed marked improvement:

- Students demonstrated increased confidence and independence in completing pre-class tasks.

- Class participation during synchronous discussions improved, with more students volunteering to share interpretations of reading texts.

- Peer collaboration was notably stronger, with struggling students supported directly through group-based scaffolding and instructor facilitation.

Instructional delivery in Cycle II was rated as;

- **Instruction clarity**: 4 (Good)

- **Relevance of materials and tasks**: 5 (excellent)

- **Transition between tasks and concepts**: 4 (Good)

- **Student engagement and task completion**: High and consistent

Across both cycles, all 13 items from the observation checklist (pre-class and in-class adherence) were marked "**Yes**", indicating full implementation of the intervention components. No observations were marked as "No" or "Not Sure."

### C.　Synthesis of Observational Insights

Observation data strongly align with the quantitative findings. As students became more familiar with the digital learning ecosystem and as instruction improved across cycles, their engagement, comprehension, and independence increased. Key instructional factors that contributed to this shift included:

- The use of video content to preview complex ESP concepts.

- The integration of asynchronous discussions to support vocabulary learning

- Scaffolded group tasks that facilitated peer-to-peer clarification

- Timely lecturer feedback both during and after sessions

These findings suggest digital media integration in a CBLT framework not only improved reading comprehension but also enhanced the overall learning experience by promoting collaboration, autonomy, and motivation among ESP learners.

### 3.3. Student Perception (Questionnaire)

Responses from the perception questionnaire administered at the end of Cycle II were grouped thematically. Three main themes emerged:

1. Usability and Accessibility

   - Most students agreed that the LMS platform was easy to use after the initial orientation
   - WhatsApp support was viewed as essential for real-time clarification
   - The YouTube video lessons allowed them to revisit material at their own pace

2. Motivation and Confidence

   - Several students reported feeling more motivated because of the multimedia approach
   - Exposure to digital media enhanced their confidence in understanding ESP texts
   - Students preferred the multimodal learning experience over traditional reading activities

3. Comprehension Support

   - Many learners indicated that visual explanations from videos helped them understand business-related vocabulary in context
   - Forum discussions and peer explanation clarified parts of the text they did not fully understand during individual reading

### 3.4. Interview Findings

Semi-structured interviews were conducted with six students (three from each class). The following summarized insights were drawn:

Student Interviews:

Students appreciated the independence allowed by asynchronous learning but emphasized the need for clearer instructions in Cycle I.

One student mentioned:

> "In the first meeting, I didn't really know what to do on Moodle. But in the second cycle, it was much easier because the tasks were clearer and the videos helped."

Another Student commented:

> "I don't usually like reading long texts, but when I could watch a video first, I understood the topic better."

These findings support the broader consensus in current educational research regarding the transformative potential of digital technologies in learning environments. In line with Abedi (2024), who noted that technology must move beyond productivity tools to foster constructivist, student-centred pedagogy, the international integration of LMS, WhatsApp collaboration, and AI-generated videos in our CBLT model facilitated active, learner-driven reading engagement–evident in both quantitative and qualitative observations. Similarly, Alenezi (2023) highlighted the effective digital learning ecosystem in higher education, promoting content access and enhancing learner motivation through interactive platforms. Our study mirrors these insights, showing that multimodal digital options increased student confidence and engagement. Thus, this research reinforces previous findings while demonstrating

a coherent and replicable design for embedding digital modalities in ESP instruction—bridging the gap between technology policy and classroom practice for impactful language development.

## 4. CONCLUSION

This study concludes that the integration of digital media into a Content-Based Language Teaching (CBLT) approach significantly enhanced students' reading comprehension in an English for Specific Purposes (ESP) context. The application of a two-cycle Classroom Action Research (CAR) revealed consistent improvement in students' post-test scores, with a statistically significant mean gain of 34.35 points. Observation data further demonstrated that students became more engaged, autonomous, and collaborative as the intervention progressed, especially in Cycle II, where instructional materials were more structured, multimodal, and responsive to learner needs. The effective use of the Moodle-based LMS, WhatsApp peer discussions, and AI-generated videos contributed to better vocabulary retention, clearer understanding of ESP texts, and greater learner confidence.

These findings support previous research that emphasizes the importance of integrating digital media to foster learner-centered instruction (Alenezi, 2023; Ginting et al., 2024). Furthermore, this study aligns with Abedi (2024) argument that bridging the gap between educational technology policy and actual classroom practices requires thoughtful pedagogical adaptation. In this case, digital media not only supported content delivery but also enhanced student agency and interaction, key elements in modern ESP instruction. As such, this study contributes empirical evidence for the continued evolution of digital-supported language education and offers a replicable model for educators aiming to blend technology with purposeful content-based instruction in higher education.

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