

## Enhancing English Language Teaching through Digital Transformation in Higher Education: A Case Study of Chiang Rai Rajabhat University\*



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### Abstract

This study aimed to investigate: 1) the impact of digital transformation on students' English language proficiency; 2) students' perceptions of their English language learning through digital platforms; and 3) students' digital literacy skills in the context of English online learning. The participants were 749 first-year students enrolled in the General English for Communication (GEN2001) course during the first semester of the 2021 academic year. A mixed-methods design was employed, including pre- and post-tests to measure language proficiency and a student satisfaction survey with Likert-scale and open-ended items to assess perceptions and digital literacy. Instruction was delivered using the Bichronous Online Instruction (BOI) model, integrating real-time sessions via Google Meet and Google Classroom with asynchronous tasks on the English Discoveries Online (EDO) platform.

The research results were found that:

1. The findings revealed a statistically significant improvement in post-test scores ( $p < 0.001$ ) and increased student confidence in digital learning.
2. Survey results indicated positive perceptions of the BOI approach, with 82% expressing greater comfort in navigating online platforms.
3. Qualitative responses emphasized engagement, self-paced learning, and motivation, though challenges such as connectivity and the need for guidance were reported.

The study recommends optimizing digital tools, enhancing support systems, and refining instructional strategies to promote effective and inclusive digital English language learning.

**Keywords:** English Language Teaching; Digital Transformation; Higher Education

### Introduction

In recent years, advancements in educational technology have significantly transformed English language teaching (ELT), particularly in Thai higher education, by shifting traditional classrooms toward more flexible, interactive, and digitally enhanced environments. This shift has increased accessibility, learner autonomy, and engagement. The COVID-19

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pandemic accelerated this transition, prompting widespread adoption of online instruction as an emergency response (Bozkurt & Sharma, 2020). Despite these developments, concerns remain regarding the effectiveness and inclusivity of digital transformation, particularly in under-resourced regions. Although prior studies have examined digital integration in ELT, more research is needed on its specific impact on student proficiency, digital literacy, and perceptions in regional contexts.

Chiang Rai, Thailand's northernmost province, presents a distinct case where recurring PM2.5 air pollution during the dry season has frequently disrupted face-to-face learning. Chiang Rai Rajabhat University (CRRU), a public institution serving community development, has faced class suspensions due to hazardous air quality (Kasemkijwattana et al., 2021), underscoring the need for adaptive digital instructional models. In response, CRRU has adopted blended and online learning strategies to ensure academic continuity and support its diverse student population.

To facilitate digital transformation in ELT, CRRU implemented platforms such as English Discoveries Online (EDO), a CEFR-aligned adaptive learning tool (Edusoft, 2020), and the Bichronous Online Instruction (BOI) model, which combines synchronous sessions via Google Meet and Google Classroom with asynchronous learning (Martin, Polly, & Ritzhaupt, 2020). Grounded in Technology-Enhanced Language Learning (TELL), these models aim to enhance language proficiency and digital literacy. However, their effectiveness depends on equitable access to technology, learners' digital readiness, instructional design quality, and availability of personalized support.

This study investigates the impact of digital transformation on students' English language proficiency, analyzes their perceptions of online English learning platforms, and examines their digital literacy skills at CRRU. Using a mixed-methods approach, the study contributes to digital pedagogy discourse and offers insights for strengthening ELT in regional and under-resourced contexts. Findings are expected to inform policy, instructional design, and learner support strategies for inclusive and sustainable digital language education.

### **Objectives of the Research**

1. To investigate the impact of digital transformation on students' English language proficiency.
2. To analyze students' perceptions of their English language learning through digital platforms.
3. To examine students' digital literacy skills in the context of English online learning.

## Research Methodology

This study employed a mixed-methods research design incorporating quantitative and qualitative approaches to examine the effects of digital transformation in English language teaching (ELT) among first-year students at Chiang Rai Rajabhat University (CRRU).

### 1<sup>st</sup> Step: Documentary Study

The study began with an extensive review of literature and theoretical frameworks related to Technology-Enhanced Language Learning (TELL), the CEFR framework, and Bichronous Online Instruction (BOI). These concepts provided the foundation for instrument design and guided the evaluation of digital transformation practices at CRRU.

### 2<sup>nd</sup> Step: Field Study

The field study took place at Chiang Rai Rajabhat University (CRRU), targeting first-year students enrolled in GEN2001 (General English for Communication) during Semester 1/2021. The course was delivered using the BOI model integrating Google Meet, Google Classroom, and English Discoveries Online (EDO).

### 3<sup>rd</sup> Step: Key Informants

The key informants in this study were 749 first-year students enrolled in the GEN2001 (General English for Communication) course during Semester 1/2021 at Chiang Rai Rajabhat University (CRRU). They were selected through stratified random sampling from a total population of 2,071 students. These students participated in the digital transformation intervention during the course implementation.

### 4<sup>th</sup> Step: Instruments and Methods

4.1 Bichronous Online Instruction (BOI) was the core instructional model adopted in this study, integrating synchronous learning via Google Meet and Google Classroom with asynchronous activities delivered through the English Discoveries Online (EDO) platform. The intervention was implemented over 15 instructional weeks (45 hours in total), as outlined in Table 1. This model aligns with best practices in blended learning (Garrison & Vaughan, 2008; Yajie & Jumaat, 2023), which emphasizes the value of combining real-time interaction with flexible, self-paced learning environments.

**Table 1:** BOI and EDO Implementation Schedule

Weeks	EDO Units	Mode of Instruction	Hours
1-8	Basic 2 Unit 1-8	Bichronous (Meet, Classroom, EDO)	24
9	Midterm Exam via EDO	Online Exam	3
10-16	Basic 3 Unit 1-8	Bichronous (Meet, Classroom, EDO)	21
17	Final Exam via EDO	Online Exam	3
Total instructional hours (excluding examination)			45

4.2 Pre- and post-tests were administered via the EDO platform and aligned with CEFR A2 standards to measure students' English proficiency before and after the intervention. Although course grading included multiple components (Table 2), the statistical analysis in this study focused exclusively on the EDO Midterm and Final Exams, which served as standardized CEFR A2-level benchmarks.

**Table 2:** Assessment and Evaluation Structure

Grading Components for English Proficiency Evaluation	Percentage
1. EDO Course Completion Reports	30
2. EDO Midterm & Final Exams (Online)	40
3. Classroom Assignments (2 video clips)	20
4. Online Class Attendance (Google Meet)	10

**Notes:** All components aligned with CEFR A2 can-do descriptors for reading, vocabulary, and grammar.

4.3 Structured questionnaire comprising Likert-scale items and open-ended questions was used to assess students' perceptions, engagement, satisfaction, and challenges in digital learning. The instrument was validated by three experts using the IOC method, and reliability was confirmed with a Cronbach's alpha of 0.88.

#### 5<sup>th</sup> Step: Data Collection

Quantitative data were collected from 749 first-year students selected by stratified random sampling from a population of 2,071. English proficiency data came from CEFR A2-aligned pre-tests and post-tests administered via the EDO platform in Week 1 and Week 17. These focused on grammar, vocabulary, and reading comprehension. Students' perceptions were assessed using structured questionnaires with Likert-scale items, while digital literacy skills and learning challenges were explored through thematic analysis of open-ended responses.

#### 6<sup>th</sup> Step: Data Analysis

Pre- and post-test scores were analyzed using descriptive statistics (mean and S.D.) and paired sample t-tests to evaluate proficiency gains. These scores were drawn from the EDO Midterm and Final Exams. Questionnaire responses were analyzed with descriptive statistics to assess satisfaction, engagement, and instructional effectiveness. Open-ended responses were analyzed thematically to explore digital literacy and learning barriers. Two independent coders used inductive coding, and inter-coder reliability was confirmed with Cohen's kappa = 0.81.

#### 7<sup>th</sup> Step: Presentation of Research Results

Results were presented using both descriptive and interpretive formats, integrating quantitative outcomes (test scores and survey results) with qualitative themes from open-

ended responses. This multi-method approach enabled triangulation for comprehensive understanding of students' proficiency gains, perceptions, and digital learning experiences.

## Research Results

The 1<sup>st</sup> objective is to investigate the impact of digital transformation on students' English language proficiency. To address the first research objective, pre- and post-test scores from the EDO Midterm and Final Exams—aligned with CEFR A2 standards—were analyzed to evaluate the impact of digital transformation on students' English language proficiency. Table 3 presents the mean scores, standard deviations, and results of the paired-sample t-test used to assess the effectiveness of the Bichronous Online Instruction (BOI) model and the English Discoveries Online (EDO) platform.

**Table 3:** Comparison of Pre-test and Post-test Scores

Assessment	Mean Score	Standard Deviation (S.D.)	t-statistic	p-value
Pre-test	24.50	7.54	51.50	p < 0.001
Post-test	44.95	7.87		

From Table 3, the paired-sample t-test confirmed that the post-test mean score ( $\bar{X} = 44.95$ , S.D. = 7.87) was significantly higher than the pre-test mean score ( $\bar{X} = 24.50$ , S.D. = 7.54), with a t-statistic of 51.50 and a p-value < 0.001. This statistically significant difference indicates a substantial improvement in students' English language proficiency following the digital transformation intervention. These findings support the effectiveness of the BOI model and EDO platform in improving students' grammar, vocabulary, and reading comprehension within the CEFR A2 framework.

The 2<sup>nd</sup> objective is to analyze students' perceptions of their English language learning through digital platforms. To address the second research objective, a satisfaction survey was administered focusing on three key aspects including content appropriateness, media quality, and instructional management. Table 4 summarizes the mean scores, standard deviations, and interpretive ratings of students' responses.

**Table 4:** Summary of Student Satisfaction Survey Results

Aspect	Mean	S.D.	Interpretation
1. Content Appropriateness	3.84	0.88	Positive
2. Media Quality	3.88	0.82	Positive
3. Instructional Management	3.77	0.84	Moderate

From Table 4, The satisfaction survey results presented in Table 4 indicate varying levels of student perceptions across the three evaluated aspects. Media quality received the highest mean score ( $\bar{X} = 3.88$ , S.D. = 0.82), suggesting that students expressed favorable perceptions regarding the clarity, interactive design, and accessibility of the digital learning

materials. Content appropriateness followed closely ( $\bar{X} = 3.84$ , S.D. = 0.88), reflecting positive perceptions regarding the relevance, clarity, and usefulness of the instructional content in supporting English language learning. In contrast, instructional management received a slightly lower rating ( $\bar{X} = 3.77$ , S.D. = 0.84), indicating moderate satisfaction. The findings highlight areas where instructional practices could be refined to better support students—particularly in terms of clearer instructions, more timely feedback, and well-structured learning activities.

The 3<sup>rd</sup> objective is to examine students' digital literacy skills in the context of English online learning. To address the third research objective, this section presents key findings from the qualitative content analysis of 749 open-ended survey responses. Table 5 summarizes the emergent themes that reflect both the challenges and the benefits students encountered while navigating digital learning environments.

**Table 5:** Themes from Qualitative Content Analysis

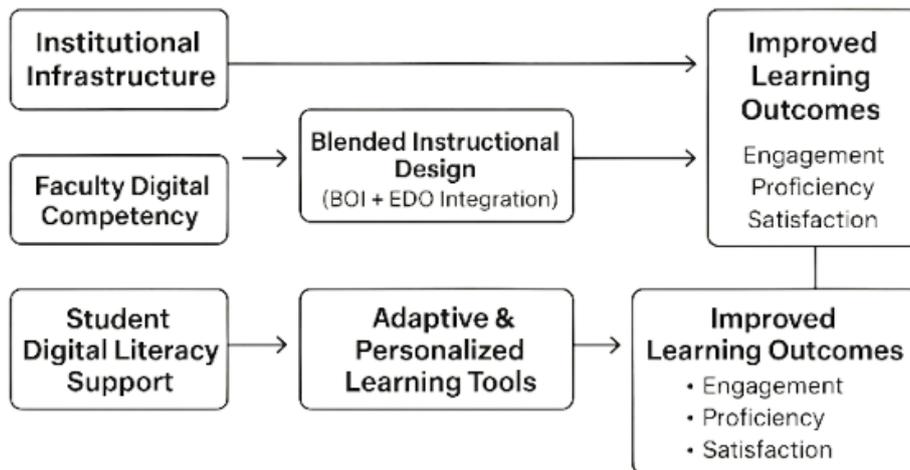
Emergent Themes	f	%	Representative Quotation
1. Increased Engagement and Motivation	53	7	"Digital tools made learning more interesting."
2. Appreciation for Flexibility	31	4	"I could learn anytime, which helped my studies."
3. Challenges with Digital Literacy	183	24	"Initially, navigating the platform was challenging."
4. Technical and Infrastructure Challenges	466	62	"Connectivity issues disrupted learning often."
5. Need for Personalized Support	16	2	"More personalized guidance would help greatly."
<b>Total</b>	<b>749</b>	<b>100</b>	

As shown in Table 5, the most frequently reported issue was technical and infrastructure challenges ( $f = 466$ , 62%), with students citing unstable internet and limited device access as major barriers to online learning. This was followed by challenges with digital literacy ( $f = 183$ , 24%), particularly in navigating platforms and managing unfamiliar tools, especially early in the learning process. Despite these obstacles, some students shared positive experiences. Increased engagement and motivation ( $f = 53$ , 7%) were attributed to the interactive features of digital tools, while appreciation for flexibility ( $f = 31$ , 4%) reflected satisfaction with self-paced learning. A smaller group ( $f = 16$ , 2%) expressed the need for personalized support, suggesting that flexibility alone was insufficient without tailored guidance from instructors. Overall, the findings reflect a dual perspective as students encountered technical and digital skill-related barriers, yet many also appreciated the autonomy, engagement, and flexibility offered by online platforms. These insights underscore

the need to address both infrastructural limitations and pedagogical challenges to ensure the effective implementation of digital education.

## The New Body of Knowledge

### Digital Learning Development Framework



**Figure 1:** Digital Learning Development Framework (DLDF)

At Chiang Rai Rajabhat University (CRRU), the Digital Learning Development Framework (DLDF) was developed as an innovative, step-by-step model for implementing effective digital English instruction. It addresses immediate instructional needs while contributing to the broader field of Technology-Enhanced Language Learning (TELL), especially in transitional or hybrid learning contexts. The process begins with strengthening institutional infrastructure, including digital systems, internet access, and administrative readiness. Faculty digital competency is then prioritized to support the design and delivery of technology-integrated lessons. Once foundational elements are in place, CRRU employs a blended instructional design combining synchronous instruction via Bichronous Online Instruction (BOI)—through platforms such as Google Meet and Google Classroom—with asynchronous, self-paced learning using English Discoveries Online (EDO). Notably, DLDF is platform-flexible and adaptable to evolving technologies. Parallel to instructional implementation, student digital literacy support is provided to ensure equitable access and build learners' confidence in digital environments. The final component integrates adaptive and personalized learning tools to accommodate varying proficiency levels and promote learner autonomy. Grounded in CRRU's implementation experience, the DLDF presents a scalable and adaptable model for digital transformation in English language education, reinforcing the university's leadership in pedagogical innovation.

## Discussion of research results

From the research results of the 1<sup>st</sup> objective, it was found that students' English language proficiency significantly improved after the implementation of digital learning tools. The post-test mean score ( $\bar{X} = 44.95$ , S.D. = 7.87) was significantly higher than the pre-test ( $\bar{X} = 24.50$ , S.D. = 7.54), with a t-value of 51.50 and  $p < 0.001$ . This is because the blended digital approach—through the Bichronous Online Instruction (BOI) model and the English Discoveries Online (EDO) platform—offered structured and interactive learning opportunities. This finding is consistent with the concept of Technology-Enhanced Language Learning (TELL) and supports the research of Bozkurt and Sharma (2020) and Woo and Choi (2021), who reported that integrated digital platforms enhance student learning performance.

From the research result of the 2<sup>nd</sup> objective, it was found that students had generally positive perceptions of their English language learning through digital platforms, particularly in terms of media quality ( $\bar{X} = 3.88$ , S.D. = 0.82) and content appropriateness ( $\bar{X} = 3.84$ , S.D. = 0.88). This is because the digital materials were clear, relevant, and interactive, which increased students' engagement and satisfaction. However, instructional management received a slightly lower score ( $\bar{X} = 3.77$ , S.D. = 0.84), indicating moderate satisfaction and pointing to areas such as instructional clarity, feedback timeliness, and coordination that require improvement.

Students with higher digital literacy levels expressed more favorable learning experiences, while those with limited technological exposure encountered challenges in navigating online platforms. This is because digital competence plays a key role in how learners interact with and benefit from digital learning environments. This is consistent with the research work of Almusharraf and Khahro (2020), who found that well-structured digital content contributes to learner satisfaction and supports the findings of Dawilai et al. (2021), who emphasized the value of blended learning in promoting learner autonomy and instructional adaptability.

From the research result of the 3<sup>rd</sup> objective, it was found that students expressed both positive and negative perspectives on digital transformation in English language learning. Five key themes emerged from qualitative content analysis: increased engagement and motivation, appreciation for flexibility, challenges with digital literacy, technical and infrastructure challenges, and the need for personalized support.

The most frequently reported challenges were technical and infrastructure issues ( $f = 466$ , 62%) and digital literacy limitations ( $f = 183$ , 24%). This is because students, particularly those from rural areas, experienced unstable internet connections and struggled to navigate digital platforms. These obstacles limited their full participation in online learning. This finding is consistent with the concept of the digital divide and supports the research work of Ożadowicz (2020), who noted that digital readiness influences learning outcomes, and Wang and Winstead (2021), who highlighted the importance of institutional support in digital transformation efforts.

Conversely, some students reported increased motivation ( $f = 53$ , 7%) and appreciation for flexible, self-paced learning ( $f = 31$ , 4%). A smaller number ( $f = 16$ , 2%) indicated the need for personalized support, suggesting that while digital tools offer autonomy, some learners still require structured guidance. This is because learner autonomy alone may not suffice in the absence of individualized support systems.

Overall, this is consistent with the blended learning framework which emphasizes balancing flexibility with support. Institutions must therefore enhance digital infrastructure, provide digital literacy training, and implement guided learning strategies to ensure equitable access and success for all learners in digitally mediated environments.

## Conclusion

This study examined the impact of digital transformation on English language teaching (ELT) at Chiang Rai Rajabhat University (CRRU), focusing on students' English proficiency, perceptions of digital learning, and digital literacy skills. The findings revealed that students' English proficiency improved following the structured digital transformation model through the integration of Bichronous Online Instruction (BOI) and English Discoveries Online (EDO). Students' perceptions of digital learning were positive, particularly regarding the relevance, clarity, and engagement of online content; however, moderate concerns were noted in instructional management, highlighting the need for more structured pedagogical support. Students' digital literacy skills showed both advancement and challenges, as many reported greater confidence in navigating digital platforms, while some continued to face technological and infrastructural barriers. Overall, the findings indicate that digital transformation, when properly implemented, can promote the development of language proficiency and digital skills. Moving forward, CRRU should strengthen its infrastructure, refine instructional design, and expand learner support systems to promote more inclusive, flexible, and sustainable digital English education environments.

## Suggestions

From the results of the research, the researchers offer the suggestions as follows:

### 1. The suggestions from the research

From the results of Research Objective 1, it is recommended that institutions enhance instructional strategies through structured blended learning models. The integration of synchronous instructor-led sessions with asynchronous, self-paced activities—as seen in the BOI and EDO platforms—should be maintained and refined to create more engaging and supportive English language instruction aligned with CEFR standards.

From the results of Research Objective 2, educational institutions and teacher training programs should prioritize faculty development. Continuous professional development

programs should aim to improve digital pedagogy, instructional management, and the use of adaptive learning technologies to enhance engagement and support.

From the results of Research Objective 3, institutions should implement comprehensive digital support systems. These include structured training before course enrollment, peer-assisted learning, real-time help desks, and partnerships with ISPs to improve access. Offline materials should also be made available to ensure equitable participation, especially for students in rural areas.

## 2. The suggestions for future research

To build upon the findings and limitations of this study, future research should address the following areas to further advance digital transformation in English language teaching (ELT).

2.1 Future studies should explore the long-term impact of digital learning on English language acquisition and academic performance across diverse learner profiles and proficiency levels using a quasi-experimental research design. While the current study examined short-term learning outcomes through pre- and post-tests in a single course (GEN2001) among first-year students during Semester 1/2021, a quasi-experimental approach involving comparison groups or longitudinal data collection would provide stronger evidence of the effectiveness and sustainability of digital instruction over time.

2.2 Since the study was conducted solely at Chiang Rai Rajabhat University (CRRU), the findings may not be fully generalizable to other institutions, student groups, or course contexts. Therefore, comparative research across multiple universities, academic disciplines, or instructional levels is recommended. Such studies could examine how institutional settings, resource availability, and curricular variations influence the implementation and success of digital learning frameworks like the DLDF.

2.3 This study focused specifically on BOI and EDO platforms, which may limit generalizability to other learning management systems (LMS) or instructional models. Thus, future research should investigate the effectiveness of alternative LMS platforms and blended learning approaches used in different educational settings. In addition, further research should examine how institutional policies can standardize and support digital teaching practices across faculties while allowing for contextual flexibility and shaping sustainable digital learning strategies across higher education institutions.

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