

## Learning Outcomes of a General English Course Implementing Multiple E-learning Technologies and Active Learning Concepts

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This study attempts to initiate discussions on integrating the concepts of smart classroom and active learning into general English course design. It examines students' learning outcomes after studying a general English course involving ICT integration, integrated-skills approach, and formative assessment, developed from the concepts of smart classroom and active learning. The data were collected during the 3rd academic term (January-May 2018) that consisted of students' pre- and post-tests scores on vocabulary, listening, grammar, reading and writing. There were 983 students (77.8% female and 22.2% male) involved with various educational backgrounds and English proficiency levels. The data were examined by using paired-samples t-test, independent t-test, one-way ANOVA and analyses of students' improvement by changes of levels. The results indicate significant differences in students' scores in total and across skills. These results shed light on curriculum and course design with regards to the integration of ICT, integrated-skills approach, and formative assessment.

**Keywords:** smart classroom, active learning, ICT integration, integrated-skills approach, formative assessment, general English course

### Introduction

Scholarly articles on curriculum development and course design in English Language Teaching (ELT) context often focus on the guidelines and explanations of the principles, frameworks, need analyses, goals, etc. (e.g., Baurain, 2010; Cotterall, 2000; Nation, 2000; Nunan, 1991), yet lacking tangible cases and empirical analyses of how particular ways of curriculum development and course design impact achievement and learning outcomes. Meanwhile, criticism is often addressed to teachers for their lack of specialist knowledge necessary for the created target materials, and frequently, in the context of English for Specific Purposes (ESP), debates whether teachers should be an expert in the target subject of the course being designed are still going on (Anthony, 2007). The ELT literature has not provided sufficient examples in the areas of general English course design. Thus, to bridge the gap between the literature and teacher's needs on course design, the present study highlights one general English course design based on the concepts of "Smart Classroom" and "Active Learning", which involves ICT integration, integrated-skills approach, and formative assessment at a university in Thailand. Statistical analyses of how this general English course design impacts achievement and learning outcomes are also provided as follows.

## Background of the Study

English curriculum in Thailand lays stress on the development of autonomous learning, independent work, innovation and ICT integration in and outside classroom (Kanoksilapatham, 2007). Teaching approaches include integrated-skills, cooperative learning, content-based learning, task and problem-based learning, and holistic learning; communicative language teaching approach is still widely used, but primarily for listening and speaking (Wiriyachitra, 2002). In a comparative study between process and product of English language learning in the National Education Act (NEA) and Ministry of Education (MoE) of Thailand, Watson Todd and Keyuravong (2004) suggest the use of in-house built materials to meet the standards and criteria of English teaching and learning arranged by the NEA and MoE; this also means that Thai teachers would be more self-reliant and less dependent on materials from other countries, which eventually form a source of innovation and teaching ideas. Besides, Thai teachers would be able to integrate local cultures into their teaching materials which has been identified to be essential in enhancing students' learning outcomes (Fan, 2011; Haixiao & Clifford, 2011; Kanoksilapatham & Suranakkharin, 2018)

The present study takes place at Walailak University, Thailand. One of the educational policies is to promote "Smart Classroom" and "Active Learning". Accordingly, it demands all the provided courses to involve technology and active learning in the course design. The general English courses are administered by formerly known as Walailak University Language Institute (WULI), currently recognized as School of Languages and General Education (SOLGEN). When this study was conducted, the offered general English courses adopted theme-based learning with integrated-skills approach, as instructed in the curriculum, which was used as the foundation during the course design process. All the teaching related materials, including textbook, syllabus, worksheet, assessment, pre- and post-tests, etc., were designed by WULI lecturers, based on the information provided in the curriculum mentioned earlier, which is also called TQF (Thai Qualifications Framework for Higher Education). Students are required to take general English courses for two years during their undergraduate study, meaning that, at least, they must take one general English course each term. Among the offered general English courses are, for instance, English for Media Communication, English in Cultural Diversity, English in Health Sciences, and English in Social Sciences; given the specific purposes that each of these courses have, some might include them in English for Specific Purposes (ESP) category.

The designs of general English courses at Walailak University must follow the concepts of smart classroom and active learning. In ELT, the term "Smart Classroom" is not often mentioned in the literature as this concept was initially discussed in the distance education literature because of the development of internet-based education applications (Sevindik, 2010). Instead, the focus is more on the concepts of ICT integration into language teaching to facilitate synchronous and asynchronous learning (Chen, Liu, & Wong, 2007; Lubis, Ariffin, Muhamad, Ibrahim, & Wekke, 2009), extend teacher-student interactions in and outside classroom (Barrs, 2012), develop autonomous learning (Bakar, 2007), and improve learning outcomes and achievement. Moreover, with regards to active learning, in a more restricted definition in class, it is a concept of learning that involves students in a myriad of activities rather than just simply watching a lecture and taking notes (Felder & Brent, 2009). Among the activities, for instance, are *think-pair-share* and *thinking aloud pair problem-solving*, which make students work individually and in pair, then share their responses in class. Active learning refers to student activity and engagement that put emphasis on learning outcomes and require thoughtful participation from students (Prince, 2004). It is based on constructivist theory focusing on practical, activity-based teaching and learning, in which students develop their own frames of thought throughout the process (KeenGwe, OnChwari, & OnChwari, 2009).

## Research Questions

The main objective of this study is to explore students' learning outcomes after studying a general English course involving ICT integration, integrated-skills approach, and formative assessment, developed from the concepts of smart classroom and active learning at Walailak University, Thailand. The present study, hence, addresses the following research questions:

1. How do students' learning outcomes in vocabulary, listening, reading, grammar and writing differ before and after studying a general English course implementing multiple e-learning technologies and active Learning Concepts?
2. Are students' learning outcomes statistically different across gender and proficiency levels?
3. How are students' improvements by changes of levels before and after taking the course?

## Literature Review

### ICT Integration in ELT and Course Design

The idea of integrating ICT (information and communications technology) tools into ELT classroom, accompanied by the swift development of internet and digital applications, has received substantial attention in the literature. It is believed that ICT tools can extend learning beyond physical classroom as well as contribute to a wide range of educational development and shape effective learning (Ibrahim, 2010; Yunus, Nordin, Salehi, Redzuan, & Embi, 2013). When effectively used, ICT tools can enhance student learning process ranging from increasing participation, stimulating cognitive development, enhancing problem-solving skills, and supporting collaborative works to facilitating authentic assessment (Puckett, 2013). Further, ICT has the dimensions to support systemic reform initiatives corresponding to policies and practices, which can generate changes in curriculum goals, assessment of learning outcomes, roles of teachers and learners, and connectedness of classrooms, thereby initiating educational transformations (Law, 2008).

One of the educational transformations offered by ICT is the possibility to create and implement competence or skills-based assessment focus by means of computer-based testing either in multiple choice or essay formats (Redecker, 2013). Computer-based testing, that is connected to the internet, opens another opportunity to extend the assessments to the use of smartphones. One of the examples of ICT tools that can facilitate such intent is Socrative.com, a free online website and mobile app designed to conduct a real-time assessment through various forms of tests, including multiple-choice, short-answer, and true-false questions (Robledo, 2012). Awedh, Mueen, Zafar, and Manzoor (2015) explored the suitability of ICT tools employing Student Response System (SRS), such as Socrative, in facilitating active learning in classroom at a Community College in Jeddah, Saudi Arabia. Their findings confirmed the positive impacts of using Socrative on student learning performance, especially on enhancing students' awareness of their level of knowledge and providing clarifications regarding the understanding of concepts. In addition, Socrative is suggested to be used at the beginning, during, or at the end of the class by Valiente, Cazeville, and Jover (2016); the results of their study indicate the use of Socrative for promoting students' active participation and involvement in the course as well as self-assessment tool. The benefits of using Socrative for visualizing and organizing assessment involving both in real-time and post-assessment reports have been confirmed by previous studies (e.g., Kaya & Balta, 2016; Mork, 2014; Nawalaniec, 2015), which can advance formative assessment environment through the integration of mobile technologies (Backhouse, Wilson, & Mackley, 2014)

Moreover, the initial stage to have ICT integrated into classroom is to have it integrated into course design first. The primary reason is that course design provides the outlines of goals, objectives, content, methodology, and assessment that must be followed by teachers (Lambert, 2001). Weidemen (2003)

suggests that the course details must make language learning possible, embrace communicative perspective on language, enable learners to focus on the learning process, and consider learners' personal experience. The course development processes involve needs assessment, determining learning goals and objectives, conceptualizing content, selecting and developing materials and activities, organization of content and activities, and evaluation (Graves, 1996). These processes lead to the stage where course designers explore and select the appropriate ICT tools that support the language learning process and help achieve the learning outcomes. Technology must work in a way that can assist learners to obtain the knowledge of the language and the knowledge of using the language properly in communicative situations (Aykut, 2008).

Then, the next step is to ensure that teachers integrate the ICT tools embedded in the course design into their everyday teaching. Sutherland et al. (2004) argue that teachers' everyday use of ICT in classroom practices is one of the key determinants to transform teaching and learning; at this point, teachers need to fathom the ways where ICT can be productively integrated into their subject materials, and personally embrace utilized ICT tools to transform their own learning process, particularly in the aspect of adjusting their teaching repertoire. This also means that teachers anticipate the situations before equipping students' everyday learning with potential ICT tools, since integrating ICT tools into ELT classroom has challenges and barriers for both students and teachers (Dudeny & Hockly, 2012; Salehi & Salehi, 2012). Among those challenges and barriers, as reflected in the findings of a mixed-methods case study from Hu and McGrath (2012), include lack of ICT facilities and pedagogic expertise, ICT related training, and communication networks and technical support hinder the smooth implementation of the ICT reform. The literature has also indicated a gap between the use of ICT tools for teaching purposes and the actual implementation in EFL contexts, such as course books (Hismanoğlu, 2011).

In the literature, previous studies have confirmed some results with regards to integrating ICT into course design, especially on improving learning outcomes and student achievement in the focused English skills. For instance, empirical studies have revealed the positive impacts of utilizing Web 2.0 platforms in enhancing students' writing skills, such as using Facebook as a means of peer assessment (Shih, 2011), using Facebook to develop students' collaborative writing skills (binti Shukor & Noordin, 2014), using Storify to increase student involvement and improve writing performance (Laire, Casteleyn, & Mottart, 2012), using forums, blogs, and wikis to progress students' performance on English writing styles (Miyazoe & Anderson, 2010), and using wiki-based peer-correction (de Paiva Franco, 2008). Web 2.0 platforms encourage learner independence and provide opportunities for collaboration and creativity during the learning process (Pinkman, 2005). Nonetheless, the findings from Yunus, Nordin, Salehi, Embi, and Salehi's (2013) study on the use of ICT in teaching ESL writing skills advice that teachers tend to be weak in managing problems and planning activities that involve the use of ICT in teaching writing skill; this becomes a concern since the class would be difficult to be controlled and have more distractions in an ICT integrated class.

ICT-enhanced EFL classroom has also been confirmed to contribute to the advancement of various English skills. Freihat (2014) investigated the effect of integrating Massive Open Online course (MOOC) on developing listening skills of Saudi Arabian EFL learners and found the significant development of the experimental group compared to the control group. Learners' reading comprehension appeared to be improved through computer-assisted language learning (Marzban, 2011). Web-based language learning affects learners' grammar proficiency at university level (Yusof & Saadon, 2012). One of the benefits of technology-enhanced instructions is the opportunity to accommodate students' multiple intelligences and develop autonomous learning inside and outside classroom (Ezza & Bakry, 2014).

## **Integrated-Skills Approach**

Hinkel (2010) reviewed the historic and methodological reasons behind the separation of teaching the four macro English skills: speaking, listening, reading, and writing. The review results reflected the ineffectiveness of the separation of the four English skills; it is simply irrelevant to the situations of

communication in real life, which often involve the four skills. In the present day, the goal of being able to communicate by using English at International levels has been echoed muchly, especially by policy makers and educators; given this situation, Hinkel argues that integrated language teaching approach will remain as the favorite among other pedagogical models. Besides, it is important to realize that the segregation of language skills never really happens if teachers employ different types of materials and various learning activities in class. Oxford (2001), for instance, illustrates:

... in a course on intermediate reading, the teacher probably gives all of the directions orally in English, thus causing students to use their listening ability to understand the assignment. In this course, students might discuss their readings, thus employing speaking and listening skills and certain associated skills, such as pronunciation, syntax, and social usage. Students might be asked to summarize or analyze readings in written form, thus activating their writing skills. In a real sense, then, some courses that are labeled according to one specific skill might actually reflect an integrated-skill approach after all. (p. 3)

Integrated-skills approach is effective in a classroom environment aimed at prioritizing authentic communication and integrating English skills naturally (Rahman & Akhter, 20017; Akram & Malik, 2010). In other words, this approach is designed to enhance learners' communicative competence, which is one of the primary goals in foreign language acquisition. Tolstykh and Khomutova (2012) examined the effectiveness between using integrated and segregated-skill approaches in developing communicative competence of teaching staff at a university in Russia. They found that the integrated-skill approach was better in assisting the participants acquire the components of communicate competence, involving linguistic, socio-linguistic, discourse and strategic ones, and in helping the participants pass the final test. Integrated approach can also support teachers in designing materials suitable for lower levels of English proficiency learners (Aitken & Browning, 2015).

Review of previous studies not only show the success of employing integrated-skills approach in ELT, but also reveal the variety of countries that still embrace the idea. The studies have been carried out in Iran (Moghadam & Adel, 2011; Tajzad & Ostovar-Namaghi, 2014), China (Su, 2003), Colombia (Córdoba Zúñiga, 2016), Pakistan (Iftikhar & Aslam, 2017), Indonesia (Rita& Salam, 2016), and Taiwan (Su, 2007), in which most of the findings encourage the implementation of integrated-skills approach. Meanwhile, in Thailand, integrated approach has been found to be effective in improving students' writing skills (Tangpermpoon, 2008) and for teaching literature with regards to achievement and critical thinking skills (Yimwilai, 2015).

## **Formative Assessment**

Formative assessment and feedback are often put together since the goal from such assessment process is to gain thorough insights, which can be used as feedback: 1) for teachers, to adapt the teaching work to respond the learning needs, and 2) for students, to shape and improve learning competence at each stage in the learning process (Black, Harrison, Lee, Marshall, & Wiliam, 2004; Sadler, 1989). To create a positive impact on learning, Harlen and James (1996) explain that the formative assessment must be aimed at promoting learning and take into account learners' progress individually; at this point, learners play a central part in it for they must be active in their own learning, willing to understand and deal with their strengths and weaknesses in so doing producing improvement in the next stage of their learning process. However, formative assessment is essentially not about the length of the feedback loop, the place where it is conducted, or the person who carries it out, or responds it; William (2006) argues, "the crucial feature is that evidence is evoked, interpreted in terms of learning needs, and used to make adjustments to better meet those learning needs" (pp. 284-285).

TABLE 1  
*Types of Formative Assessment* (William, 2006)

Type	Focus	Length
Long-cycle	Between instructional units	Four weeks to one year or more
Medium-cycle	Between lessons	One day to two weeks
Short-cycle	Within a single lesson	Five seconds to one hour

In ELT, previous studies show some variety in findings. For instance, EFL instructors' positive beliefs of formative assessment were found to be significantly related to their practices (Guadu & Boersma, 2018): nonetheless, a study conducted in Turkey discovered that Turkish teachers prefer conventional methods of assessment to formative assessments (Öz, 2014). Formative assessment has been confirmed to be effective for the improvement of Chinese EFL learners' Academic English Writing (AEW) (Chen & Zhang, 2017). Yet, an intervention study in writing classes in Norway found that teachers must improve their assessment practices at each stage in the learning process and construct a systematic approach that enables teacher and students follows up the assessment outcomes for improving learning outcomes (Burner, 2014). Teachers are encouraged to not only focus on learners' linguistic development, but also focus on assessing learners' linguistic knowledge formatively; nevertheless, in this instance, many teachers have been found to be unaware of formative assessment procedures that can positively impact student learning (Poole, 2016).

About the impact on achievement and learning outcomes, Ozan and Kincal's (2018) study displayed that the experimental group where the formative assessment was implemented obtained a significantly higher academic achievement and had better attitudes toward the class than those in the control group. There is a small benefit gained when using formative assessment in the form of online practice tests before graded course exams (Cassady & Gridley, 2005). Specifically, in Thailand, there is a study by Chetchumlong (2010) examining the effect of web-based formative assessment on student achievement; the results showed that the experimental group outperformed the control group, but with no difference in the overall means. The experimental groups achieved better outcomes on reading and vocabulary tests.

## Method

### Participants

This study involved the first-year students who took the general English course entitled "English in Cultural Diversity (GEN60-114) in the third term (January – May 2018) at Walailak University, Thailand. The data consisted of 983 students (77.8% female and 22.2% male) with various educational backgrounds who were spread out in 37 sections/ classes (table 2). On English proficiency levels, 10 students were at Remedial, 361 students at Beginner, 518 students at Intermediate, 27 students at Advance, and 67 students were not identified. These proficiency levels were based on the placement test results in 2017 at Walailak University and were used as references during class distributions. The Remedial level involved students who obtained < 40, then followed by Beginner 40-55, Intermediate 56-69, and Advance > 70 in the placement test. As a close illustration, in the Common European Framework of Reference for Languages (CEFR), the remedial level of these students is below A1, followed by beginner at A1, lower intermediate at A2, Upper Intermediate at B1, and Advance at B2 above.

TABLE 2  
*Students' Background Information by Academic Major (N = 983)*

Major	Frequency	Percent (%)
Accountancy	99	10.1
Animal Science	4	.4
ASEAN Studies	14	1.4
Biotechnology	2	.2
Business Administration	30	3.1
Chinese Language	61	6.2
Communication Arts	23	2.3
Computer Engineering	17	1.7
Digital Information	7	.7
Economics	12	1.2
Electrical Engineering	25	2.5
English	124	12.6
Environmental Health	83	8.4
Environmental Science	10	1.0
Fisheries	3	.3
Food Technology	5	.5
Industrial Design	2	.2
Information Technology	6	.6
Interior Design	4	.4
Marine and Coastal Resource Management	8	.8
Medical Technology	108	11.0
Multimedia	33	3.4
Nursing Science	110	11.2
Occupational Health and Safety	83	8.4
Political Science	3	.3
Polymer Engineering	7	.7
Software Engineering	21	2.1
Tourism and Hotel	79	8.0

## Course Design

One of the goals in this paper is to highlight one general course English design that involves ICT integration, integrated English-skills approach, and formative assessment. This design is developed from the concepts of “Smart Classroom” and “Active Learning”, as explained earlier in the introduction section. The name of the course is English in Cultural Diversity, coded in GEN60-114, administered by Walailak University Language Institute (WULI) at Walailak University, Thailand. Based on the course description given in the TQF (Thai Qualifications Framework for Higher Education) form, this course advances the acquisition of both the four essential English skills involving speaking, listening, reading, writing, and the two key aspects in English learning including vocabulary and grammar with multi-dimensional approaches and ICT integration inside and outside classroom; emphasizing on the use of language and presentation of the cultural diversity worldwide, such as careers, lifestyles, arts and cultures, differences, tourist attractions, cultural exchanges; encompassing useful grammatical structures and vocabulary essential for effective communication. This course description was basically what the course designers received as the guidelines, which means that all the teaching related materials had to be constructed on this course description. Then, the course and learning objectives were created to be achieved in thirteen weeks, from January to May 2018, one academic term (Table 3).

TABLE 3  
*Course and Learning Objectives*

Course Objectives
1. Improve students' knowledge and skill in English pronunciation, specifically on the vocabulary related to airport, restaurant, festivals and arts, nationalities, varieties of English, and living overseas.
2. Enhance students' knowledge and skills on vocabulary usage in cultural diversity contexts.
3. Develop students' understandings of texts and conversations on cultural diversity.
4. Advance students' speaking skills in discussing and expressing ideas on cultural diversity.
5. Increase students' writing skills to the use of preposition, adjectives, wh-questions, and simple present in reflective short essays.
Learning Objectives
1. Students can use English fluently when they are at airport, restaurant, festivals, art exhibitions, and overseas.
2. Students can understand various forms of communication, such as text and conversation, in diverse cultures situations.
3. Students can present their own culture to others as well as have awareness of cultural diversity in other countries.
4. Students can reflect their experiences on cultural diversity in short essays.

From the course and learning objectives outlined earlier, it is evident that this course aims at enhancing learners' skills in speaking, vocabulary, listening, reading, grammar, and writing. Integrated-skills approach appears to be clearly adopted in this instance. The student textbook contains four units that consist of Airport, Restaurant, Living Abroad, and Festivals, Arts, and Crafts. The sections in each unit involve warm-up activities, reading, listening, pronunciation, vocabulary, grammar points, speaking, writing, assignments, and supplemental-self learning materials. There is also teacher's book provided for detailed instructions on what teachers should prepare and teach in each week.

The evaluation of achievement involves ten vocabulary tests conducted every week from week 2 to week 11, four role-play performances conducted in week 3, 5, 7, and 9 in class, Writing Tasks in week 3, 5, 7, and 9 outside classroom, four types of homework on Pronunciation, Listening, Reading, and Grammar in week 2, 4, 6, and 8, individual interview exam in week 11 and 12 in class, and writing exam in week 11 in class. In each unit in the textbook, there are exercises that serve as practices for students in class, and some exercises in the supplemental-self learning materials that serve as practices for students outside classroom. Before the term started, students took the course pre-test that involved vocabulary, listening, reading, grammar, and writing. In the last week of the term, students had to sit in the course post-test that assessed the same skills as in the course pre-test.

In overall, the formative assessment accounts for 60% and summative assessment accounts for 40% of the students' final grades. Since a higher percentage put in the formative assessment, an online spreadsheet (Google spreadsheet) was created to ensure that teachers completed each task and uploaded the students' scores immediately after they obtained the students' scores (after class). The spreadsheet was equipped with the formula, so that teachers did not need to calculate the students' grades manually at the end of the term. The formula was based on the distributed percentage for each skill or task explained in the assessment summary (Table 4).

TABLE 4

*Assessment Summary: Formative and Summative Assessments*

Skills	Formative			Summative			
	Methods	Point (%)	Means	Place	Methods	Place	Point (%)
Vocabulary	10-Quizzes	15 (15)	Socrative	In Class	Final Exam	Exam Room	10 (5)
Speaking	4 Role-Plays	10 (10)	Role-Play	In Class	Individual Interview	In Class	10 (10)
Pronunciation	HW - Unit 3	15 (5)	Video on FB	Outside Class	-	-	-
Listening	HW - Unit 1	10 (5)	Google Form	Outside class	Final Exam	Exam Room	10 (7)
Reading	HW - Unit 2	10 (5)	Google Form	Outside class	Final Exam	Exam Room	10 (6)
Grammar	HW - Unit 4	10 (5)	Google Form	Outside Class	Final Exam	Exam Room	10 (7)
Writing	HW – Short Essay	10 (10)	WriteAbout	Outside Class	Final Exam	Exam Room	10 (5)
Total		60 %					40%

As illustrated in the assessment summary table, the course integrated various ICT tools into the teaching and learning in and outside classroom. In each unit in the textbook, the materials involved the use of MP3 file and (online) videos. On vocabulary, the university policy requires students to learn 3000 words in two years, which means 500 words in one term (three terms in one year). So, in this course, there are 10 vocabulary sets created; each set contains 50 words with definition, example, and part of speech. Students had to learn the vocabulary sets independently outside class, and they would be tested in class. There were 10 vocabulary tests prepared for these 10 vocabulary sets; one test contains fifteen questions constructed based on the referred vocabulary set, e.g. vocabulary test 1 was based on vocabulary set 1, etc. The vocabulary test was conducted in the beginning of the class for 10 minutes by means of Socrative.com. Students took the test by using their mobile phones. For writing, students wrote continuously on WriteAbout.com and teacher gave feedback online on WriteAbout.com, which could be in written or oral recorded feedback. Each homework was delivered by means of Google Form to students. Each class in this course had a Facebook Group, where teachers used it for sharing information, giving feedback, and receiving assignments, such as pronunciation assignment. Some teachers also used online quizzes, such as Kahoot and Quizzes, during their teaching activities in class.

TABLE 5

*Summary of ICT Integration Used in the Course*

Skills	ICT Tools	Purpose
Vocabulary	Socrative	Formative assessment
Pronunciation	Video and Facebook Group	Homework activity
Listening	MP3, Video, & Google Form	Listening Activity and Formative Assessment
Reading	Google Form	Formative assessment
Grammar	Google Form	Formative assessment
Writing	WriteAbout	Writing Activity
Assessment	Google Spreadsheet	Formative and Summative assessment
Practices	Kahoot and Quizzes	In and Outside class practices

## Data Collection Procedures

This study basically used both students' total scores on the pre- and post-tests and students' scores on each skill included in the pre- and post-test. The data collection followed the procedures below:

1. The questions for the pre- and post-tests were designed and ensured to reflect the teaching and learning materials in the course in December 2017.
2. The pre-test was conducted prior to the 1<sup>st</sup> week of the 3<sup>rd</sup> academic term, which was in January.

3. Teaching and learning took place for 12 weeks.
4. Then, the post-test was conducted in May 2018 after the course was concluded.
5. Students' scores from the pre- and post-tests were cleaned up and computed into SPSS for data analysis.

The pre- and post-tests questions contain 40 questions and one writing task. The questions are distributed equally to each skill, meaning that there are 10 questions for vocabulary, listening, grammar, and reading. The questions in the pre- and post- tests are different, but the types of questions are controlled and basically, the questions are about the same topics of materials. For instance, the vocabulary questions involve sentence completion, synonym, antonym, part of speech, and definition; listening questions involve topics discussed in the student textbook, such as airport and living abroad; grammar questions involve the grammar points discussed in the textbook, such as preposition, wh-questions, and simple present, etc. The writing task gives students two optional prompts, in which students are required to choose one prompt and elaborate their response with reasons and examples using 100 – 150 words.

TABLE 6  
Sample Pre- and Post-tests Questions

Sections	Pre-Test	Post-Test
Vocabulary	Selling ivory products are prohibited in this town. The synonym for prohibit is _____. 1. outlaw 2. allow 3. forbid 4. exclude	Most of our international flights have a luggage _____ of 30kg per passenger. 1. counter 2. booking 3. allowance 4. connection
Listening	Where are Gemma and Ryan Grey flying to? 1. Copenhagen 2. Auckland  3. Leiden 4. Athens	Where is the plane going to? 1. Dammam 2. La Rochelle 3. Amsterdam 4. Kuala Lumpur
Grammar	Now you can check in _____ your smartphone. 1. at 2. for 3. over 4. with	_____ are you so late? It is time to go now. 1. what 2. how 3. when 4. why
Reading	How did the writer get to his grandparents' town? 1. By plane 2. By train 3. By car 4. By bullet train	According to the text, what has been an important food for people for a very long time? 1. ice cream 2. bread 3. soup 4. rice
Writing	Nowadays we have various modes of transportation to travel. Some of us choose to travel by land, sea, or air. Which mode do you think is most preferable to you? Give reasons or examples to support your opinion.	Many students leave their home country and go abroad for higher education. Do the advantages outweigh the disadvantages? Give reasons or examples to support your opinion.

## Data Analysis

As this study was interested in examining the impacts of the course design on students' learning outcomes in vocabulary, listening, grammar, reading, writing and post-test total scores, the following statistical techniques were employed:

- 1) Paired Samples T-Test was run to find the answer for the first research question. It is used to see the impacts of the course design on the progress of student learning from the pre- to the post- test periods. This technique is to confirm if the course design has impacts on student achievement.
- 2) Independent t-test and one-way ANOVA were conducted to explore the second research question. Independent t-test examined if there were statistical differences between male and female students,

while one-way ANOVA was applied to reveal statistical differences among remedial, beginner, intermediate and advanced students.

- 3) Analyses of students' improvement by changes of levels by using Microsoft Excel was performed for the third research question. In this technique, first, four levels in the placement test were used to group the students based on the results in the pre- and post- tests, but using numbers: 1, 2, 3, 4 (table 6). Each student's score in the pre- and post- test was put in each level based on the designed range of scores. Afterwards, how many changes of levels each student has made from pre- to post-tests was calculated. For instance, if student A obtained 40 in the pre- test, and then, s/he obtained 60 in the post- test, it means that s/he has developed by one level, from level 2 to level 3.

TABLE 7  
*Levels of Students' in the Pre- and Post-test*

Levels	Range of Scores
4	80 and above
3	60 – 79
2	40 – 59
1	< 40

Basically, the changes to higher levels indicate progress in the learning process; conversely, the changes to lower levels implies no progress. As there are four levels as seen in table 6, students' scores can:

- 1) stay the same, which means 0 development, or
- 2) progress to a higher level by 1, 2, or 3 levels, or
- 3) move to a lower level by 1, 2, or 3 levels, and to specify this situation, the number is written in minus: -1, -2, and -3.

The example of the data analysis process is provided in Table 8 below. The same process is also applied to the analyses of student development in each skill included in the pre- and post- tests.

TABLE 8  
*The Example of the Data Analysis Process*

Student ID	Pre-Test Result Level	Post Test Result Level	Changes of Levels	Development/Progress
60116779	1	2	1 to 2	1
60116876	3	3	3 to 3	0
60116789	2	1	2 to 1	-1
60116865	1	3	1 to 3	2
60116097	3	1	3 to 1	-2
60116116	4	1	4 to 1	-3

This technique is to confirm if the course design has impacts on the designed learning outcomes. The learning outcomes are taken from the learning objectives explained earlier that include vocabulary, listening, reading, grammar, and writing. The analysis is interested to know how many students who make progress in their learning and achieve the designed learning outcomes. The changes of levels to higher levels indicate progress, while it is no progress for the changes to lower levels.

## Result and Discussion

### Descriptive Statistics

Descriptive comparison was conducted on students' scores in the pre- and post- tests. In total, the means of students' scores ( $N = 983$ ) indicated an increase from 21.20 ( $SD = 5.98$ ) to 26.43 ( $SD = 6.01$ ). The means of students' scores also showed an upward trend for vocabulary, listening, grammar, and writing, but not for reading (Table 9). The data were normally distributed based on the values of skewness and kurtosis between -2 and + 2 (George & Mallery, 2010) ( $Skewness = .78$  and  $Kurtosis = .16$ ), which permitted the data to be examined in the paired-samples t-test.

TABLE 9

*The Means of Students' Scores in the Pre- and Post- tests (N = 983)*

Skills	Test	Mean	SD
Vocabulary	Pre-	5.16	1.68
	Post-	5.78	1.95
Listening	Pre-	3.27	1.71
	Post-	4.85	1.65
Grammar	Pre-	5.31	2.03
	Post-	6.44	1.93
Reading	Pre-	4.28	1.49
	Post-	3.47	1.53
Writing	Pre-	3.18	2.18
	Post-	5.87	2.04
Total	Pre-	21.20	5.98
	Post-	26.43	6.01

### Research Question 1

A paired-samples t-test was conducted to compare the means of students' scores before and after taking GEN60-114 course at Walailak University. There was significant difference in students' scores for pre-test ( $M = 21.20$ ,  $SD = 5.98$ ) and post-test ( $M = 26.43$ ,  $SD = 6.01$ );  $t(982) = -34.42$ ,  $p < .001$ . These results indicate that the course design of GEN60-114 significantly impacts students' academic achievement and the alternative hypothesis is accepted. In other words, the course design involving ICT integration, integrated-skills approach, and formative assessment enhance students' learning process. The effect size of Cohen's  $d$  is -1.099, which indicates a large practical significance, with percentile standing = 84 and percent of non-overlap = 55.4% ( $d = \text{mean} / SD = -5.23 / 4.76 = -1.099$ ).

Then, the paired-samples t-tests were conducted to compare the means of students' scores for each skill in the pre- and post- tests. The results showed significant difference in students' scores: listening, grammar, and writing possess a large practical significance, while vocabulary and reading have a medium practical significance. These results confirm the significant impacts of the course design on students' academic achievement for each skill included in the pre- and post- tests (Table 10).

TABLE 10  
*The Results of Paired-samples t-test (N = 983)*

Pair (Total Scores)	Mean	SD	t	df	p-value	Cohen's d	Effect Size
Pre- and Post- Tests	-5.23	4.76	-34.421	982	.000	-1.099	Large
Vocabulary Pre- and Post- Tests	-.62	2.01	-9.696	982	.000	-.308	Medium
Listening Pre- and Post- Tests	-1.58	2.05	-24.166	982	.000	-.770	Large
Grammar Pre- and Post- Tests	-1.14	2.01	-17.734	982	.000	-.716	Large
Reading Pre- and Post- Tests	.80	2,01	12.533	982	.000	.399	Medium
Writing Pre- and Post- Tests	-2.69	2.38	-35.479	982	.000	1.130	Large

## Research Question 2

Across gender, a statistically significant difference was only observed in students' learning outcomes on reading ( $t(981) = -2.021, p = .04$ ), in which female students ( $M = 3.53$ ) performed slightly better than male students ( $M = 3.29$ ). No significant differences were noticed in vocabulary, listening, writing and grammar learning outcomes as well as in the post-test total scores. Meanwhile, the one-way ANOVA disclosed that statistically significant differences were found in vocabulary learning outcomes ( $F(4, 978) = 16.18, p < .001$ ) and post-test total scores ( $F(4, 978) = 5.54, p < .001$ ), but there were no significant differences in listening, grammar, reading and writing. The Tukey post-hoc test displayed that as expected, advanced ( $M = 7.11, SD = 1.87, p < .001$ ) and intermediate ( $M = 6.14, SD = 1.86, p < .001$ ) students obtained significant higher scores than beginner students in vocabulary learning outcomes; the same trends were also reflected in the post-test total scores: advanced ( $M = 29.18, SD = 5.21, p = .01$ ) and intermediate ( $M = 27.03, SD = 5.94, p = .001$ ) students. Nonetheless, the learning outcomes of advanced and intermediate students were not statistically different in vocabulary, listening, grammar, reading and writing. The results of one-way ANOVA and post-hoc Tukey are presented in Table 11 and 12 below.

TABLE 11  
*The Results of One-way ANOVA*

		Sum of Squares	df	Mean Square	F	Sig.
Vocabulary	Between Groups	231.753	4	57.938	16.178	.000
	Within Groups	3502.526	978	3.581		
	Total	3734.279	982			
Listening	Between Groups	12.651	4	3.163	1.162	.326
	Within Groups	2661.546	978	2.721		
	Total	2674.197	982			
Grammar	Between Groups	22.961	4	5.740	1.546	.187
	Within Groups	3631.767	978	3.713		
	Total	3654.728	982			
Reading	Between Groups	7.990	4	1.998	.848	.495
	Within Groups	2305.098	978	2.357		
	Total	2313.089	982			
Writing	Between Groups	10.228	4	2.557	.612	.654
	Within Groups	4083.604	978	4.175		
	Total	4093.833	982			
Post-Test Total Scores	Between Groups	785.904	4	196.476	5.543	.000
	Within Groups	34666.145	978	35.446		
	Total	35452.049	982			

TABLE 12

*The Results of Post Hoc Tukey HSD (Only significant results presented)*

Dependent Variable	(I) Level2	(J) Level2	Mean Difference (I-J)	Std. Error	Sig.
Vocabulary	Unidentified	1	.13731	.64155	1.000
		2	.31017	.25174	.733
		3	-.60554	.24570	.100
		4	-1.57380*	.43139	.003
	Remedial	0	-.13731	.64155	1.000
		2	.17285	.60667	.999
		3	-.74286	.60419	.734
		4	-1.71111	.70055	.105
	Beginner	0	-.31017	.25174	.733
		1	-.17285	.60667	.999
		3	-.91571*	.12975	.000
		4	-1.88396*	.37757	.000
	Intermediate	0	.60554	.24570	.100
		1	.74286	.60419	.734
		2	.91571*	.12975	.000
		4	-.96825	.37357	.073
	Advanced	0	1.57380*	.43139	.003
		1	1.71111	.70055	.105
		2	1.88396*	.37757	.000
		3	.96825	.37357	.073
Post-Test Total Scores	Undeintified	1	-.60597	2.01833	.998
		2	.80345	.79198	.849
		3	-.83493	.77296	.817
		4	-2.99116	1.35715	.179
	Remedial	0	.60597	2.01833	.998
		2	1.40942	1.90861	.947
		3	-.22896	1.90080	1.000
		4	-2.38519	2.20395	.816
	Beginner	0	-.80345	.79198	.849
		1	-1.40942	1.90861	.947
		3	-1.63838*	.40819	.001
		4	-3.79460*	1.18786	.013
	Intermediate	0	.83493	.77296	.817
		1	.22896	1.90080	1.000
		2	1.63838*	.40819	.001
		4	-2.15623	1.17526	.354
	Advanced	0	2.99116	1.35715	.179
		1	2.38519	2.20395	.816
		2	3.79460*	1.18786	.013
		3	2.15623	1.17526	.354

\*. The mean difference is significant at the 0.05 level.

### Research Question 3

The next analysis is to find out the students' improvement by changes of levels from the pre- to post-tests. Students' scores were grouped into the four levels explained earlier in table 6. Based on the total scores, there were 439 students at level 1, 456 students at level 2, 88 students at level 3, and 0 student at level 4 in the pre-test, while, in the post-test, 133 students were at level 1, 576 students were at level 2,

263 students were at level 3, and 11 students at level 4 (Table 13). The changes of levels between the pre- and post-tests indicate students' improvement as a result of the learning process.

TABLE 13  
*The Number of Students in Each Level of Score Range*

		Pre-Test					
Level	Score	Vocabulary	Listening	Grammar	Reading	Writing	Total
4	80 and above	85	16	151	14	16	0
3	60 - 79	332	91	306	180	145	88
2	40 - 59	391	298	325	488	214	456
1	< 40	175	578	201	301	608	439
		Post-Test					
Level	Score	Vocabulary	Listening	Grammar	Reading	Writing	Total
4	80 and above	199	58	313	4	193	11
3	60 - 79	336	262	361	96	355	263
2	40 - 59	330	463	240	356	319	576
1	< 40	118	200	69	527	116	133

The results of the analyses of students' improvement by changes of levels revealed that, based on the total scores of the pre- and post-tests, 28 (2.8%) students have progressed by 2 levels, 474 (48.2%) students have progressed by 1 level, 454 (46.2%) students remained at the same level, and 27 (2.8%) students moved to lower levels by 1 level (-1 level). It means that the course design helped 51% of the total students to make a progress in their learning and achieve the learning outcomes of the course, and only 2.8% of the total students who made no progress. Furthermore, about those who stayed at the same level, the detailed results showed that 117 students stayed at level 1 (12%), 268 students at level 2 (27.2%), and 69 students at level 3 (7%). The details of students' improvement by changes of levels for each skill are provided in Table 14.

TABLE 14  
*The Number of Students by Changes of Levels (N = 983)*

Changes of Levels	Vocabulary	Listening	Grammar	Reading	Writing
3	10	13	24	0	97
2	98	156	134	25	211
1	306	405	329	143	397
0	364	299	360	396	231
-1	169	98	114	322	40
-2	34	11	22	90	7
-3	2	1	0	7	0

On each skill, in total, a high number of students made progress and achieved the learning outcomes designed for writing (705/72%), then followed by listening (574/58%), grammar (487/50%), and vocabulary (414/42%). Nonetheless, a small number of students made no progress and did not fully achieve the learning outcomes designed for reading (168/17%). These results disclose that the course design assisted most of the students learning in developing their skills on writing, listening, grammar and vocabulary, but did not make significant impact on the improvement of students' reading skills. The illustration of the comparison between the number of students who made progress and no progress is depicted in Figure 1.

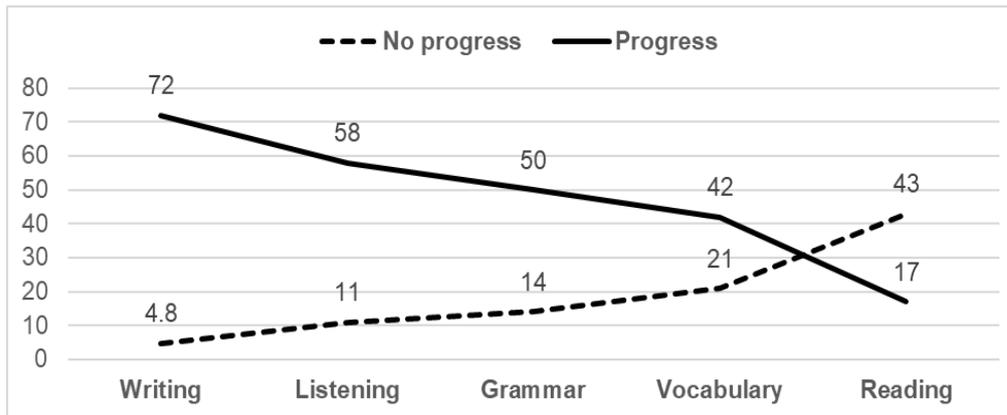


Figure 1. Comparison between the number students who made progress and no progress (%).

## Discussion

The aim of the present study is to investigate students' learning outcomes after studying a general English course that involves ICT integration, integrated-skills approach, and formative assessment, developed from the concepts of smart classroom and active learning at Walailak University, Thailand. The results of the analyses confirm that students' learning outcomes improved significantly before and after studying the general English course, implying that the course design positively impacts student achievement. At this point, it should be interpreted that these three core components of the course design, developed from the concepts of smart classroom and active learning, are the requirements to realize the enhancement on student academic achievement; in other words, the integration of one or two of the three into a general English course design might not lead to the same results. Students' learning outcomes were enhanced largely on listening, grammar, writing, but moderately on vocabulary and reading. It is assumed that the involved of audio-visual media play a role in enhancing students' learning outcomes in listening, grammar and writing; besides, students have regular in-class practices on these three skills since they are involved in each lesson in the textbook. Moderate improvement in vocabulary and reading may have some connection to students' learning interests. In addition, the results also reflect that female students achieved better learning outcomes in reading than male students, while significant differences were not observed in vocabulary, listening, grammar, writing and post-test total scores. On the other hand, based on proficiency levels, intermediate and advanced students attained greater improvements in vocabulary and post-test total scores, yet these two groups did not have a significant difference. In this instance, despite the moderate improvement in reading, female students still managed to obtain higher scores, suggesting a gender role in reading learning outcomes. Higher levels of learners will still likely attain higher scores in vocabulary and total test score than those in lower levels.

Moreover, the outcomes of the analyses of students' improvement by changes of levels also revealed a positive impact of the course design on learning outcomes. More than half of the total number of students climbed to higher levels in the post-test, while a very little number of students did not achieve the learning outcomes. Students appeared to be successful in attaining the designed learning outcomes for writing, listening, grammar, and vocabulary. Yet, the impact of the course design did not appear to be significant in improving students' reading skills. Meanwhile, the students who stayed at the same level in the pre- and post-tests could not be interpreted as progress and no progress; some of them might have been at a higher level already, which is still decent, and staying at the same level during the pre- and post-tests could indicate a slight progress given the differences of questions in both tests. There is no previous study exploring the impacts of ICT integration, integrated-skills approach, and formative assessment in general English course design on achievement and learning outcomes, especially in relation to the concepts of smart classroom and active learning. Thus, the findings of this study may pioneer future

research in this area. However, it is feasible to compare these findings with previous studies that explored each element or skill. For instance, the findings support the positive impacts of utilizing Web 2.0 platforms for improving students' writing skills (binti Shukor & Noordin, 2014; de Paiva Franco, 2008; Casteleyn, & Mottart, 2012; Laire, Miyazoe, & Anderson, 2010; Shih, 2011); the findings add up one more Web 2.0 platform, namely WriteAbout. The findings also support the effect of integrating Massive Open Online course (MOOC) on developing listening skills (Freihat, 2014), the enhancement of reading comprehension through computer-assisted language learning (Marzban, 2011), and the positive effect of Web-based language learning on learners' grammar proficiency (Yusof & Saadon, 2012).

Integrated-skills approach has been proven to fit the general English course design well, which confirms the effectiveness in a classroom environment aimed at prioritizing authentic communication and integrating English skills naturally (Akram & Malik, 2010; Rahman & Akhter, 20017). The changes to higher levels reflect that this approach can help lower level of English proficiency learners (Aitken & Browning, 2015). This study has also confirmed the same findings as the previous studies conducted in various countries that suggest the use of integrated-skills approach (e.g., Córdoba Zúñiga, 2016; Iftikhar & Aslam, 2017; Moghadam & Adel, 2011; Rita & Salam, 2016; Su, 2007; Su, 2003; Tajzad & Ostovar-Namaghi, 2014). This study has disclosed that the approach can also work in Thai higher education context and follow the findings of the previous studies in Thailand by Tangpermpoon (2008) and Yimwilai (2015). The implementation of formative assessment contributes to the progress of the student learning in this study, like what the previous studies found (Ozan & Kincal, 2018; Chetchumlong, 2010). The findings encourage the use of Student Response System (SRS), such as Socrative, for conducting formative assessment on vocabulary, which follow the previous studies from Awedh, Mueen, Zafar, and Manzoor (2015), Valiente, Cazeveille, and Jover (2016); Kaya and Balta, (2016), Mork (2014), and Nawalaniec (2015), which can inspire the integration of mobile technologies into formative assessment (Backhouse, Wilson, & Mackley, 2014).

## Conclusion

This study has highlighted one general English course design developed from the concepts of smart classroom and active learning, which involves ICT integration, integrated-skill approach, and formative assessment. The impacts of the course design on achievement and learning outcomes have also been discussed. Hence, as the conclusion, the discussion is focused on the implications of the findings for curriculum and course design. It is suggested that general English curriculum and course design considers the concepts of smart classroom and active learning. Such concepts enable the comprehensive integration of ICT, integrated-skills approach, and formative assessment, which have been found to be useful in advancing learners' achievement and realizing the designed learning outcomes in this study. Curriculum must involve frameworks that can facilitate these concepts to be translated into detailed guidelines and instructions for teachers' classroom practices every day, as seen in Figure 1. However, it is also important to mention that this type of course design demands more work from teachers in the aspects of designing materials and conducting in and outside classroom practices. The involvement of various ICT tools, focused skills, and formative assessment simply indicates the requirements of more commitment and time from teachers and students. Despite using a large sample size, the present study is limited in the aspects of statistical analyses, so future studies using more advanced statistical analyses are recommended. This study also did not explore further why the students did not achieve the designed learning outcomes for reading.

As much as this study intends to offer, it has some limitations to be acknowledged. The findings of this study should be interpreted from the results of pre- and post-test research design. This type of research design relies on the differences between two variables from the same population. This study might have obtained different findings if other research designs such as experimental research design utilizing experimental and control groups were applied. It could not adopt experimental research design due to the

policy that all the teachers should teach the course in the same way as explained in the teacher’s manual and course syllabus. Future studies are suggested to implement experimental research designs to add more discussions around this area of research. In addition, due to the type of the collected data, this study was also unable to apply more sophisticated statistical technique. It is possible that the application of more advanced statistical technique would have given some more insights in the results. Regardless, the raised research questions were successfully addressed by the selected statistical techniques as explained in the method section.

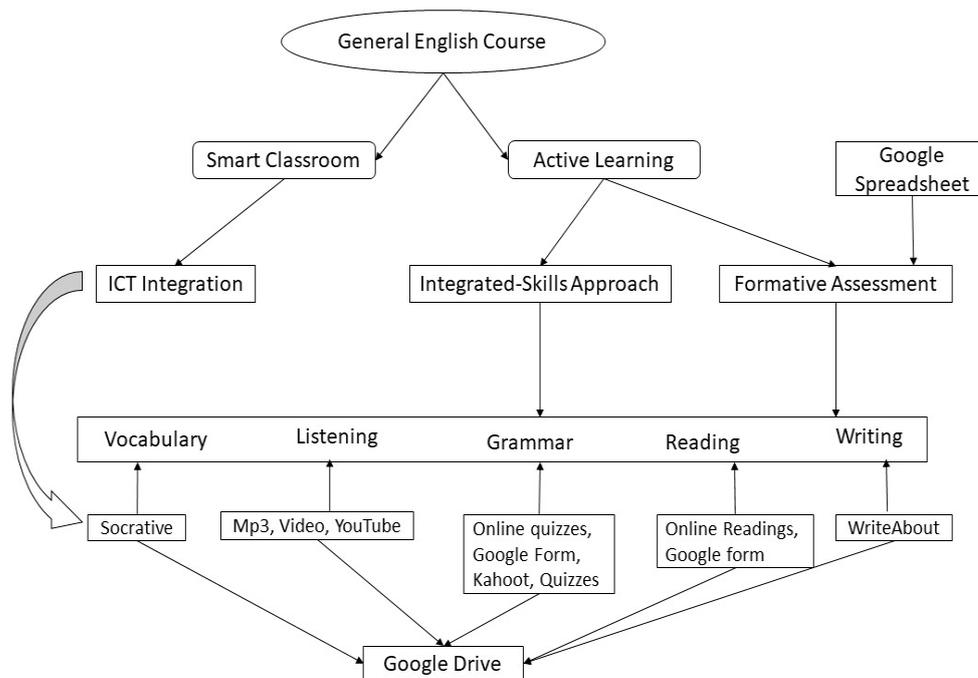


Figure 2. The illustration of the course design.

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