

## Article

# A Comparison of the Autonomous Use of Technology for Language Learning for EFL University Students of Different Proficiency Levels

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**Abstract:** Different aspects of second-language learners' autonomous use of technology for language learning have been investigated and its positive effects on language learning have been reported. However, there is a paucity of research on whether language learners' different proficiency levels are associated with their perceptions of their own autonomous use of technology-enhanced language learning (TELL). Therefore, this study examines the autonomous use of TELL outside the English classes of English learners of different proficiency levels. Ninety-nine EFL college students (47 of lower proficiency and 52 of higher proficiency) in northern Taiwan took a survey on the autonomous use of TELL. The results demonstrated that students' proficiency levels did not relate to the involvement of autonomous use of technology for language learning. Nearly one-third of all students did not take on autonomous English learning via technology outside class. The students in both groups tended towards more receptive-skill English learning activities than productive-skill activities in their autonomous use of technology, whereas the students of higher proficiency attended more productive-skill activities than those of lower proficiency. In order for students to benefit from the autonomous use of technology for language learning, proper support and guidance from instructors are crucial.

**Keywords:** EFL university students; autonomy; technology use; autonomous learning; survey



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## 1. Introduction

In Taiwan, English has been viewed as an essential foreign language and has become a compulsory course in schools of various academic levels. University students in Taiwan are required to demonstrate a certain level of proficiency in English before receiving their bachelor's degree [1]. In order to support learner proficiency in English, the Curriculum Guidelines [2] issued by the Ministry of Education specifically focus on the development of learner autonomy in English learning to fulfill lifelong learning. Thus, it is important to develop students' learning autonomy so that they can take responsibility for and self-regulate their out-of-class English learning according to what must be learned, and when and how to learn it [3]. This echoes the concept of self-directed learning, viewing learning as a learner-centered "process in which individuals take the initiatives, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies and evaluating learning outcomes" [4] (p. 18).

Digital literacy serves as an essential skill for lifelong learning [5], so learning with technology is recommended. As defined by TESOL technology standards project team, technology refers to "systems that centrally involve computer chips, digital applications, and networks in all of their forms" (p. 45) [6]. Technology has been one of the useful resources and tools supporting student learning. In particular, information technology has been widely applied in the field of language teaching and learning. The fast-growing development of technology has greatly contributed to second-language (L2) learning [7].

For example, the impact of time and space restrictions on learning a language is gradually decreasing [8]. With the use of technology, language learners are able to extend their English language exposure [9] and can get more opportunities to interact with native speakers of the target language [10]. Furthermore, learners can receive prompt linguistic feedback about their production [11] and collaborate more with peers in a computer-mediated communication setting [12]. Most importantly, learners can sharpen their language skills and develop learning autonomy through computer technology [13,14].

Technology, with various affordances, can serve as a great tool not only to foster language teaching inside regular language classes, but also to promote language learning outside of classes [15,16]. Students are encouraged to take the initiative in incorporating technology into their learning and to choose learning activities of their interest, thus extending their learning opportunities beyond their language classes. Developing the independence of learners is of particular importance in language learning, since only when learners set their own objectives and develop strategies to achieve those goals accordingly can their learning become effective and efficient [17]. Notably, research has evidenced that the autonomous use of technology outside the language class has positive effects on language gains [18–20].

## 2. Literature Review

### 2.1. *Autonomy and Second-Language Learning*

The importance of autonomy has drawn much attention from L2 researchers and educators [21–23]. Kumaravadivelu [24] strongly urged that it is critical in 21st century language-teaching pedagogy to give learners space to develop their learning autonomy. According to Benson and Lor [25], learner autonomy refers to “learners’ control over learning, which comprises active involvement in the learning process, responsibility for its control over factors such as time, frequency, pace, setting, methods of learning, and critical awareness of purposes and goals” (p. 3). For L2 learners with fewer opportunities to use the language outside of class, it is particularly crucial to increase autonomy to boost language abilities [26–28].

Numerous empirical studies have been conducted to explore students’ autonomous language learning. For example, Chan et al. [29] investigated 508 university students in Hong Kong and found that the higher learning motivation the students had, the more often they engaged in autonomous learning practices after class. Gan and colleagues [30] conducted a qualitative study of the English learning behaviors of Chinese students of different English proficiency levels, finding that students with higher learning achievements frequently take the initiative to create more learning opportunities with the use of a variety of resources. Bekleyen and Selimoglu [31] investigated Turkish university students’ perceptions and behaviors about autonomous language learning. Consistent with Gan and colleagues’ study [30], students with higher motivation undertook more learning practices outside class. Finally, Orawiwatnakul and Wichadee [32] reported a positive correlation between beliefs in autonomous language learning and frequency of learning-practice engagement outside class by conducting a survey with more than 4000 university students. Finally, Takahashi and Umino [33] conducted a longitudinal case study to explore six Japanese learners in out-of-class extensive reading activities. Based on the learners’ responses to the interviews, they felt more autonomous in the activities because they gained more ownership and responsibility over their learning objectives and process.

### 2.2. *Autonomous Use of Technology for Second-Language Learning*

With rich online resources, a variety of educational software programs, mobile devices, and social networking services, technology offers learners innumerable opportunities for autonomous learning. As shown in Reinders and White [34], learner autonomy is closely related to using technology for learning, especially in the field of language learning. The domains of autonomy and TELL should not be viewed separately. Both autonomy and TELL have exerted an influence on each other and gradually fused. This implies that

learners need to be equipped with competence in the autonomous use of technology in order to enhance computer-assisted language learning (CALL) efficacy.

There has also been a trend in recent research work to collect more evidence about learners' autonomous language-learning behaviors using technology. Especially in the digital age, "technology becomes invisible, embedded in everyday practice" (p.23) [35]. Many language learners are inclined to adopt digital technologies more easily [36]. In Roh and Kim's case study [37], five L2 learners adopted a variety of Web 2.0 tools to facilitate their language learning skills. In their learning process, they autonomously formed an e-learning community and developed autonomous learning behaviors. Lenkaitis [38] demonstrated that language learners could promote their autonomy in the context of synchronous computer-mediated communication. Tseng et al. [39] attested that three-dimensional virtual game-based environments could boost Taiwanese elementary school students' English vocabulary knowledge, learning collaboration, and autonomy. Finally, Zulkepli and colleagues [40] surveyed 289 Malaysian freshman students about their Web 2.0 tools' preference for autonomous language learning. It was found that the students favored conventional technologies specifically designed for language learning, such as online quizzes and discussion forums.

Given that autonomy and technology use are positively associated with each other, language educators and researchers have been interested in exploring how language learners take initiatives to use technology for language learning, focusing particularly on how students strengthen their learning outside the language class. For example, Shih [41] used Google sheets as English learning logs for 67 Taiwanese university students to record their out-of-class learning process and progress. After analyzing students' learning logs and responses to the survey and interview, the researcher found that the students adopted metacognitive strategies like self-monitoring and self-evaluation in their learning and promoted their learning beliefs, both of which were beneficial in promoting their learning autonomy. Lai and Gu [42] surveyed 279 university students' self-initiated use of technology for learning a foreign or second language. They found that there was a great diversity in terms of preparedness for incorporating technology into learning, as well as frequency and types of technology used for self-regulated language learning. Furthermore, they believed that "a stronger belief in seeking language use opportunities beyond the classroom was positively associated with participants' likelihood of using technology to regulate their learning" (p. 327). Following the thread of technology-use belief, Lai [43] interviewed 20 undergraduates in Hong Kong to examine the relationship between out-of-class autonomous technology use for language learning and learning beliefs. The finding revealed that learning beliefs had a crucial impact on learners in terms of their learning engagement, the selection of technology tools for autonomous language learning, and technological experiences. Moreover, Lai et al. [18] explored the quality of learning English via technology beyond the formal setting and surveyed 82 Hong Kong junior-high-school English learners. The survey results showed that the more diversified learners used technology to advance learning needs out of class, the more confidence and enjoyment they had in English learning.

There have been a few studies further examining the use of technology in learners' autonomous language-learning activities. Research has found that language learners were more inclined to undertake receptive skill activities than productive skill activities [44–46]. Moreover, Honarзад and Rassaei [47] surveyed 100 Iranian EFL learners' technology-based out-of-class language-learning activities. The three most frequent activities were as follows: searching in English on search engines, using dictionaries or translators, and watching movies and TV, whereas the three least frequent were: writing in English on social media, playing games in English, and conversing with native English speakers. Finally, Lai and colleagues [48] surveyed 676 Chinese university students and found that nearly 40% of them did not autonomously undertake any English-learning activities using mobile devices. For those who self-directed their language learning, vocabulary learning and translation practices were more frequent activities.

Three studies specifically highlighted how learners used language-learning apps in their free time. García Botero and Questier [49] recruited 574 university students to take their survey. The survey responses showed that the students were only slightly engaged in their Duolingo tasks due to their busy life schedules. García Botero and colleagues [50] surveyed 118 university students and stated that the students perceived the app as encouraging and appreciated its connection between their formal learning in class and their self-directed learning. However, the students in both studies asked for more training and support to enhance their self-directed learning outside of class. Finally, to explore the autonomous use of apps in informal language learning, Rosell-Aguilar [51] surveyed 4095 users of Busuu, one of the most popular language-learning apps. Based on the survey responses, most of the survey respondents were beginner English learners. Female users were inclined to use the app less frequently, but for longer periods of time. The respondents overall perceived the app to be useful for their language learning.

Since learners have been found to adopt diverse and complex technology practices in their language-learning experiences, researchers delve further to identify which factors are likely to affect L2 users' autonomous use of technology for learning/teaching a language. Lai [16] analyzed 339 surveys gathered from L2 learners in Hong Kong universities and observed the relationship of variables related to the self-regulated use of technologies through the construction of structural equation modeling. The finding suggested a list of attitudinal factors resulting in learners' self-regulated use of technology. Furthermore, Deng and Tavares [52] observed how 42 pre-service English teachers autonomously used two online platforms, Google Sites and Facebook, to keep connected, exchange ideas, and share materials during their teaching practices. By surveying and interviewing participants as well as examining their online posts, the researchers found that, in the informal teaching practices, the participants were prepared and able to use various technologies to fulfill their different needs. This shows that participants' awareness of the affordances of varying technologies affected their autonomous use of technology.

Given that the autonomous use of technology can be advantageous to language learners, there is concern about how to support learners in autonomous technology use in their learning. Learner training in particular has received much attention because students are not necessarily able to use technology effectively for language learning, regardless of having high computer skills [53,54]. To foster learner autonomy, learner training should involve modeling and practice of learning strategies [55]. Smith and Craig [56] designed a university-level course to provide language learners with systematic assistance in using information-technology resources. They demonstrated that the course successfully fostered students' positive perspectives on autonomous learning and helped them focus on metacognitive skills, leading to the more critical use of computer resources. In addition, Lai et al.'s online training program [5] was confirmed to strengthen Chinese students' motivation, knowledge, and skills for the autonomous use of technology for language learning.

Language teachers play an important role in the development of learner autonomy in a face-to-face or online context [57,58]. As suggested by Voller [59], teachers can play three roles in fostering learner autonomy (i.e., facilitator, counselor, and resource) and provide learning support, guidance, knowledge, and expertise. Lai [60] examined the effect of teacher behaviors on the autonomous student use of TELL. After analyzing survey and interview data from Hong Kong university students, she concluded that affection, capacity, and behavior support could have different impacts on autonomous use of technology. This highlights the importance of providing learners with sufficient teacher support. Furthermore, two more studies examined teachers' perceptions of their own roles in facilitating autonomous use of technology for language learning. Although language teachers' behavior greatly affects learners' technology use, Toffoli and Sockett [61] found that teachers were not aware of the potential mediating roles they could play in enhancing students' learning experience. Lai et al. [62] also found a mismatch between students' and teachers' perceptions of the amount of teacher support appropriate for autonomous use of technology in language learning. Students expected more teacher involvement

in recommending various technological resources and strategic use; teachers, however, thought of themselves as having limited responsibility because of the overestimation of students' ability and inadequate teacher ability to offer support. Finally, Zarei and Hashemipour [63] found that their Web-based instruction effectively promoted Iranian students' autonomy and motivation for English language learning.

Based on the previous literature review, autonomous use of technology for language learning outside of regular classes could promote learner proficiency levels. According to the concept of learning from good language learners [64–66], successful language learners exhibit various behaviors, strategies, and characteristics in approaching language learning compared to those of the less successful. Understanding successful language learners' autonomous use of technology-enhanced language learning (TELL) could thus help shed light on how to support students in developing their proficiency via technology in their self-directed language learning. Although different aspects of TELL have been examined, there is a paucity of research on whether language learners' proficiency levels are related to their perceptions of the autonomous use of TELL. Specifically, the comparison between learners of higher proficiency and those of lower is under-researched. Thus, to fill the gap, this study examines the autonomous use of TELL outside regular English classes of students of different proficiency levels.

Two research questions guided the study:

1. Is there any significant difference between Taiwanese university students of higher proficiency levels and those of lower proficiency levels in their autonomous use of technology to learn English?
2. What English learning activities did Taiwanese university students of higher proficiency levels and those of lower proficiency levels autonomously undertake through technology?

### 3. Methodology

#### 3.1. Study Design

The current adopted a mixed-method design which had predominantly quantitative with qualitative elements. A survey methodology was adopted in the study. According to Dörnyei and Taguchi [67], the survey approach enables researchers to collect information from participants within a short period of time and to process data in a straightforward way. Thus, because of its efficiency, a survey-based study was administered to fulfill the research purpose in the study.

The conceptual foundation of the study was rooted in learning from good language learners [62–64], hypothesizing that “successful learners had particular constellations of personality characteristics, cognitive styles, attitudes, motivations, or past learning experiences that were different from those of less successful learners” [68] (p. 309). Good language learners tend to display certain behaviors, strategies, and characteristics to undertake language learning tasks. As Rubin [65] argued, “if we knew more about what the ‘successful learners’ did, we might be able to teach these strategies to poorer learners to enhance their success record” (p. 42). The gap between good language learners and poor language learners can be minimized. Thus, exploring how learners with different proficiency levels use technology autonomously for learning English outside their regular English classes helps promote our understanding of the learning process of a target language.

#### 3.2. Context

The study was conducted in a private, comprehensive university in northern Taiwan at a time when face-to-face schooling still took place prior to the closures caused by the COVID-19 pandemic. The university has emphasized its foreign-language curriculum and requires all undergraduates to study foreign languages for at least two years. English is a required course for all freshman students. Meanwhile, sophomore students can continue taking more advanced-level English courses or select to study a different foreign language, such as Spanish, French, or Japanese, to fulfill the requirement. However, among all foreign language courses, English still predominates.

Furthermore, the university actively encourages students to learn foreign languages, especially English, using various channels. The Foreign Language Teaching and Learning Resources and Self-learning Center offers a range of multimedia materials to students and has opened a self-access language-learning center. In addition to including face-to-face learning activities, the university focuses on online self-access English learning. A multitude of online learning activities promotes English learning, such as writing tutoring, videoconferencing with highly proficient English speakers, and interactive discussion for language learning on a social media site. Furthermore, online learning materials, such as electronic books, magazines, and practice tests, are provided free of charge to students.

### 3.3. Participants

Convenience sampling was used to seek participants. The researcher obtained permission from an instructor to recruit possible participants from her two advanced-level Freshman English classes and two beginner-level Freshman English classes. The instructor was the only one who taught both advanced-level and beginner-level classes in the same semester at the research site. The researcher explained the research purpose to the students and received 47 students' research consent from the beginner-level classes and 52 students' research consent from the advanced-level classes.

According to the university ability-grouping policy on Freshman English courses, the courses are categorized into three levels: advanced, intermediate, and beginner. The participants were assigned to Freshman English classes of different levels based on their English scores in the College Entrance Examination (CEE). According to the Holistic Center of the university, which is responsible for assigning students to Freshman English with different levels, students achieving within the top 25% of CEE English scores out of all freshman students were assigned to advanced-level classes and those within the bottom 25% of CEE English scores out of all freshman students were assigned to beginner-level classes. In Yu and colleagues' study [69], which was conducted in the same research site, the English scores of students in the advanced-level classes were statistically higher than those in the beginner-level classes ( $F = 812.18, p < 0.001$ ). Students in the advanced-level classes also statistically outperformed those in the beginning-level classes in the Online Oxford Proficiency Test ( $F = 220.81, p < 0.001$ ). Moreover, the CEE English subject has been demonstrated to be valid in measuring learners' proficiency [70,71], and learners' CEE English scores were found to be positively correlated with those in the General English Proficiency Test, a well-known testing measure commissioned by the Ministry of Education in Taiwan to gauge EFL learners' English language proficiency [72]. Thus, the proficiency level of the students in the advanced-level classes was higher than that of the students in the beginner-level classes. However, the terms of advanced-level and beginner-level were used for class assignment practices. To avoid the controversy that could have arisen between students with these differing levels of proficiency, students in the advanced-level classes and those in the beginner-level classes were viewed as two distinct groups. One group was "students of higher proficiency", and the other group was "students of lower proficiency". A cautionary statement about their proficiency level difference is that the relationship between the two groups' proficiency levels was relative. It is not claimed that students with higher proficiency had advanced English proficiency levels and students with lower proficiency had beginner levels.

Table 1 shows the participants' background profiles. The age of the participants in both groups was similar, and both had been learning English for 12 years. The majority of students in both groups spent more than three hours a day using technology. According to the response means of the 5-point Likert scale items (1 means "not at all" and 5 means "very much"), the students in the advanced classes were more motivated and engaged in English learning than those in the beginner-level classes (a statistically significantly higher score found in the advanced-level classes after an independent  $t$ -test analysis with  $t = -3.57, p < 0.01$ ). Moreover, their English teacher did not often demonstrate how to use technology to learn English ( $M < 3$ , less than occasionally). However, when it comes to using technology for

English learning outside regular classes, more students of higher proficiency spent longer time than those of lower proficiency.

**Table 1.** Participants' Background Profiles.

	Students of Lower Proficiency ( <i>n</i> = 47)	Students of Higher Proficiency ( <i>n</i> = 52)
Age	M: 19.04 years SD: 0.86	M: 18.90 SD: 0.87
How long have you been learning English?	M: 11.74 years SD: 2.66	M: 11.69 years SD: 2.95
Are you motivated to learn English? <sup>1</sup>	M: 3.15 SD: 1.27	M: 4 SD: 1.10
Do you enjoy learning English? <sup>1</sup>	M: 3.32 SD: 1.07	M: 4.29 SD: 1.07
How much time can you use technology per day?	≤1 h: 4 (9%) >1, but ≤3 h: 9 (19%) >3, but ≤5 h: 13 (28%) >5, but ≤10 h: 12 (26%) >10 h: 9 (19%)	≤1 h: 1 (2%) >1, but ≤3 h: 9 (17%) >3, but ≤5 h: 25 (48%) >5, but ≤10 h: 12 (23%) >10 h: 5 (10%)
How much time can you use technology per day for learning English? <sup>2</sup>	≤1 h: 36 (77%) >1, but ≤3 h: 10 (21%) >3, but ≤5 h: 0 (0%) >5, but ≤10 h: 1 (2%)	≤1 h: 31 (60%) >1, but ≤3 h: 17 (33%) >3, but ≤5 h: 3 (6%) >5, but ≤10 h: 1 (2%)
How frequently does your English teacher display how to use technology to learn English? <sup>3</sup>	M: 2.96 SD: 0.66	M: 2.79 SD: 0.80

<sup>1</sup> 1: Strongly disagree; 2: Disagree; 3: Neutral; 4: Agree; 5: Strongly agree. <sup>2</sup> The percentage was rounded to the second decimal point. <sup>3</sup> 1: Never; 2: Rarely; 3: Occasionally; 4: Nearly every class; 5: Every class.

### 3.4. Instruments

Data for the study was collected from an online survey via Google Forms (<https://docs.google.com/forms>). The survey was presented in English and Mandarin to ensure an accurate understanding by the students. The two researchers, native Mandarin speakers teaching university-level English, translated the survey and confirmed the correspondence between English and Mandarin expressions. The survey consisted of five sections with checking items, open-ended short-answer items, and five-point Likert-scale items. The items of computer-assisted learning and autonomous use of technology for language learning were from Lai [16] on autonomous language learning through technology. The researcher developed survey items by collecting data from university students in Hong Kong. A structural equation modeling (SEM) framework was constructed to detect possible factors affecting autonomous language learning through technology. The model resulted in high values in the comparative-fit and Tucker–Lewis indices, suggesting that all factors successfully be identified. Furthermore, two university professors specializing in TELL were invited to examine the items and confirm their appropriateness for the current study. Thus, due to the research context in Lai's study [15] being similar to ours in the EFL university environment and the confirmation from the experts in computer-assisted language learning, the survey fitted the purpose of the current study. The survey sections were as follows:

- (1) Demographic information (e.g., age, major, and gender) with three checking items
- (2) English learning background with a short-answer item and five five-point Likert-scale items, such as years of studying English, and motivation for and enjoyment of studying English
- (3) Computer-assisted learning with 18 five-point Likert-scale items, like technology use, perceived usefulness, and computer self-efficacy
- (4) Autonomous use of technology for language learning with 27 five-point Likert-scale items, comprising nine categories: technology use, perceived usefulness of technology,

- computer self-efficacy, goal commitment regulation, resource regulation, affection, cultural learning, metacognition, and social connection
- (5) An open-ended question about autonomous activities for learning English through technology outside of class: “What out-of-class activities have you ever done autonomously to learn English through technology?”.

All identified information of participants in the survey responses was removed, and the survey responses were carefully protected to ensure anonymity and confidentiality under the supervision of the Institutional Review Board at the research site.

### 3.5. Procedure

At the end of the fall semester, the study was announced in various English classes to call for volunteers. Before the participants completed the survey, they were fully informed of the research purpose. After understanding their rights in participating in the research, such as the confidentiality of personal information, every participant explicitly permitted the researchers to analyze their survey responses. Afterward, they spent around 20–25 min answering the online survey on their mobile phones or laptops.

### 3.6. Data Analysis

To analyze collected data, both quantitative and qualitative analyses were conducted. Descriptive statistics were applied to analyze the background information of survey items. Next, to ensure the reliability of individual subsets of autonomous technology use for language learning, Cronbach’s coefficient alpha was calculated. The values were 0.91, 0.87, 0.93, 0.91, 0.94, 0.88, 0.91, and 0.92, respectively for technology use, perceived usefulness of technology, computer self-efficacy, goal commitment regulation, resource regulation, affection, cultural learning, metacognition, and social connection. The values indicated a highly reliable survey [73].

Inferential statistics was used to answer Research Question 1: Is there any significant difference between Taiwanese university students of higher proficiency levels and those of lower proficiency levels in their autonomous use of technology to learn English? A parametric statistical approach, independent *t*-test, was used to analyze the participants’ responses to the survey items of the autonomous use of technology for language learning. The alpha level was at 0.05.

Moreover, qualitative data gleaned from the open-ended question about the participants’ autonomous learning activities to boost their English proficiency were analyzed with a thematic analysis in an inductive way [74]. The researcher and his research assistants read all the responses together and looked for activities involving autonomous technology use for English learning. The categories of the activities were further identified. Moreover, peer checking [75] was conducted with two professors specializing in TELL to ensure trustworthiness. Any disagreement was resolved by discussion. Finally, the frequency of the categories was counted in the descriptive statistics. The result of data analysis from the open-ended question would answer Research Question 2: What English learning activities did Taiwanese university students of higher proficiency levels and those of lower proficiency levels autonomously undertake through technology?

## 4. Results

The summary statistics of autonomous computer use for the English-language learning of Taiwanese university students of different proficiency levels are presented in following tables. The survey-item response means of students of higher proficiency ranged between 3.19 and 4.21, showing their overall positive opinions of the item statements. However, the means range of the autonomous use for English-language learning of the students of lower proficiency was wider, from 2.89 to 4.17. A statistical approach, the independent *t*-test, was used to detect any significant difference in individual survey items.



#### 4.1. Attitudes towards Technology Use

The students' attitudes towards the use of technology for English learning and its perceived benefits as well as the ability to use computer technology for English learning are displayed in Table 2. There was no significant difference in their responses between the students of different proficiency levels. Regardless of language proficiency, both students of low and high proficiency most highly rated the statement of "To learn more about the language and culture" and "To expand my learning resources and venues" in terms of technology use and perceived usefulness, implying that students greatly valued technology as a useful way to gain an in-depth understanding of English and its culture and gather learning materials.

**Table 2.** Attitudes towards Technology Use for Language Learning, Perceived Usefulness, and Computer Self-Efficacy between Students of Lower Proficiency and Students of Higher Proficiency: *t*-test Results.

Items	Students of Lower Proficiency ( <i>n</i> = 47)		Students of Higher Proficiency ( <i>n</i> = 52)		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Technology use						
To learn more about the language and culture	3.96	1.00	3.96	1.03	−0.02	0.98
To help persist in achieving language learning goals	3.60	1.04	3.56	1.02	0.18	0.85
To help monitor language learning progress (assess learning progress, adjust learning goals, and plan learning tasks or materials)	3.83	1.01	3.54	1.02	1.43	0.16
To seek learning strategies and tips	3.87	0.97	3.58	1.09	1.42	0.16
To expand opportunities to use the language	3.87	1.03	3.83	1.06	0.22	0.83
To sustain/enhance motivation and interest in learning the language	3.70	1.00	3.79	1.00	−0.43	0.67
To seek engaging learning activity or experience	3.85	0.98	3.92	0.99	−0.36	0.72
To connect with native speakers and/or other learners of the language	3.74	0.97	3.77	1.11	−0.12	0.91
Perceived usefulness						
To enhance my language learning outcomes	3.85	0.84	3.83	0.92	0.14	0.89
To improve my language learning experience and environment	3.91	0.90	3.87	0.93	0.27	0.79
To help monitor my language learning progress	3.83	0.92	3.60	0.87	1.30	0.20
To sustain or enhances my motivation and interest in learning the language	3.68	0.89	3.90	0.87	−1.26	0.21
To expand venues of emotional support and learning support	3.57	0.88	3.60	1.00	−0.11	0.91
To expand my learning resources and venues	4.17	0.82	4.21	0.87	−0.24	0.81
Expands language use opportunities	4.02	0.87	4.00	0.95	0.12	0.91
Computer self-efficacy						
I am confident with my abilities in using technologies effectively for language learning.	3.32	0.81	3.42	1.04	−0.55	0.58
I am confident with my abilities in selecting appropriate technologies for my language learning needs.	3.55	0.83	3.67	0.94	−0.67	0.51
I am confident with my abilities in using technologies to create an enjoyable language learning experience.	3.40	0.83	3.65	1.06	−1.29	0.20

Note. Likert scale: 1 = strongly disagree; 5 = strongly agree; all numbers were rounded to the second decimal point.

#### 4.2. Aspects of the Autonomous Use of Technology for Language Learning

According to Lai and Gu [42], the nature of the autonomous use of technology for language learning was mainly construed as six aspects—goal commitment, resource regulation, affection regulation, culture-learning regulation, metacognition, and social-connection regulation, which are presented in the following tables.

##### 4.2.1. Goal Commitment

The first aspect was goal commitment, that is, learners' perseverance in achieving the desired goal. As shown in Table 3, no significant difference was found in the responses of the students of different proficiency levels, although the students of lower proficiency

responded in slightly higher numbers than the students of higher proficiency. Both students of higher and lower proficiency rated “I believe ICTs can help me achieve my language learning goals more quickly and efficiently” the highest among the items regarding goal commitment, displaying their recognition for potential language-learning benefits brought by technology.

**Table 3.** Computer Use for Language Learning regarding Goal Commitment Regulation between Students of Lower Proficiency and Students of Higher Proficiency: *t*-test Results.

Items	Students of Lower Proficiency ( <i>n</i> = 47)		Students of Higher Proficiency ( <i>n</i> = 52)		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Information and communication technologies (ICTs) are important sources and tools to maintain my interest in achieving my language learning goal.	3.62	0.85	3.54	1.02	0.41	0.68
I believe ICTs can help me persevere in reaching my ultimate goal of learning the language.	3.55	0.90	3.38	1.03	0.86	0.39
I believe ICTs can help me achieve my language learning goals more quickly and efficiently.	3.72	0.77	3.63	1.03	0.48	0.63

Note. Likert scale: 1 = strongly disagree; 5 = strongly agree; all numbers were rounded to the second decimal point.

#### 4.2.2. Resource Regulation

The next aspect was resource regulation, which describes learners’ actions to seek and expand resources for their language learning [42]. As can be seen in Table 4, both groups’ means were close in each item concerning resource regulation. These discrepancies did not reach statistically significant differences. Both students of higher and lower proficiency levels evaluated the item the highest “I use ICTs to create and increase opportunities to learn and use the language” in terms of resource regulation, demonstrating their awareness of the ICT affordances for gaining language-learning opportunities.

**Table 4.** Computer Use for Language Learning regarding Resource Regulation between Students of Lower Proficiency and Students of Higher Proficiency: *t*-test Results.

Items	Students of Lower Proficiency ( <i>n</i> = 47)		Students of Higher Proficiency ( <i>n</i> = 52)		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
When I feel I need more learning resources in the language, I use ICTs to expand my learning resources.	3.64	0.99	3.77	0.94	−0.68	0.50
I use ICTs to expand my learning experience beyond the language classroom.	3.66	0.84	3.69	0.98	−0.18	0.86
I use ICTs to create and increase opportunities to learn and use the language.	3.79	0.86	3.79	0.94	−0.01	1.00
I use ICTs to seek learning resources and opportunities to help achieve my language learning goals.	3.74	0.85	3.73	0.93	0.08	0.94
I seek engaging language learning materials and experience delivered via ICTs.	3.72	0.93	3.65	1.01	0.36	0.72

Note. Likert scale: 1 = strongly disagree; 5 = strongly agree; all numbers were rounded to the second decimal point.

#### 4.2.3. Affection

Subsequently, affection regulation means “to regulate emotions and enhance the attraction of learning” [43] (p. 325). Students’ responses to the seven items about affective regulation were displayed in Table 5. It was found that no significant difference between the two groups was evident. The item “When I feel bored with learning the language, I use

ICTs to curtail the boredom and increase enjoyment” was highly scored by both students of higher and lower proficiency, suggesting that ICT was viewed as a practical approach to boost their language-learning emotion.

**Table 5.** Computer Use for Language Learning regarding Affection Regulation between Students of Lower Proficiency and Students of Higher Proficiency: *t*-test Results.

Items	Students of Lower Proficiency ( <i>n</i> = 47)		Students of Higher Proficiency ( <i>n</i> = 52)		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
When I feel bored with learning the language, I use ICTs to curtail the boredom and increase enjoyment.	3.87	1.03	3.90	1.09	−0.15	0.88
I use ICTs to make the task of language learning more attractive to me.	3.83	0.87	3.62	1.07	1.09	0.28
I feel ICTs effectively maintain my interest and enthusiasm in learning the language.	3.81	0.85	3.71	1.05	0.50	0.62
When I start to resist learning the language, I use ICTs to help myself regain the interest and enthusiasm in learning.	3.55	0.90	3.44	1.09	0.55	0.59
ICTs help to make my language learning a relaxing process.	3.74	1.03	3.54	0.96	1.03	0.31
ICTs make me enjoy learning the language more.	3.79	1.00	3.58	1.05	1.02	0.31
I use ICTs to increase the time I spend on learning the language.	3.74	0.97	3.65	1.03	0.45	0.65

Note. Likert scale: 1 = strongly disagree; 5 = strongly agree; all numbers were rounded to the second decimal point.

#### 4.2.4. Cultural Learning

The following aspect, culture-learning regulation, refers to supporting cultural understanding of a target language by means of technology [42]. Similar to the previous instances, the result did not show any significant differences between the students of different proficiency levels (see Table 6). However, students with different proficiency levels were not in agreement with each other on the items with the highest scores. Students of lower proficiency highly agreed that they used ICTs to solve their language and cultural learning questions, whereas those of higher proficiency tended to focus more on using ICT to explore target cultures. This suggests that both groups of students had various orientations toward using ICTs for cultural learning. The lower proficiency group was inclined to problem-solving, while the higher proficiency group used ICTs primarily to expand their understanding of target cultures.

**Table 6.** Computer Use for Language Learning regarding Culture Learning Regulation between Students of Lower Proficiency and Students of Higher Proficiency: *t*-test Results.

Items	Students of Lower Proficiency ( <i>n</i> = 47)		Students of Higher Proficiency ( <i>n</i> = 52)		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
I use ICTs to seek answers to my questions about the language and culture	4.11	0.89	4.10	0.98	0.05	0.96
I use ICTs to help myself understand and appreciate the target culture better	3.87	0.90	4.15	0.92	−1.54	0.13
I use ICTs to help myself to increase my ability to interact with the target culture	3.81	0.90	3.96	0.97	−0.81	0.42

Note. Likert scale: 1 = strongly disagree; 5 = strongly agree; all numbers were rounded to the second decimal point.

#### 4.2.5. Metacognition

Afterward, metacognition regulation was defined as the ability to plan, monitor, and evaluate learners' learning development [42]. As illustrated in Table 7, there were no significant differences found between the students of different proficiency levels. However, they gave different statements with the highest score. The lower-proficiency students agreed more on "For the areas that I'm weak in, I know how to select and use appropriate ICTs to improve the areas", while the higher-proficiency group selected "I am satisfied with the way I use ICTs to help myself persevere in reaching my goal in learning the language", suggesting that the two groups preferred different meta-cognitive strategies regarding the use of ICTs.

**Table 7.** Computer Use for Language Learning regarding Metacognition Regulation between Students of Lower Proficiency and Students of Higher Proficiency: *t*-test Results.

Items	Students of Lower Proficiency ( <i>n</i> = 47)		Students of Higher Proficiency ( <i>n</i> = 52)		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
I know how to use ICTs to effectively monitor myself to achieve the learning goals at each stage.	3.26	0.85	3.21	1.00	0.23	0.82
I plan learning tasks and relevant materials to do outside of school that involve the use of ICTs.	3.43	0.99	3.19	1.12	1.09	0.28
I adjust my language learning goals in response to the information resources and communication venues I have access to via ICTs.	3.51	0.86	3.21	0.96	1.63	0.11
I am satisfied with the way I use ICTs to help myself persevere in reaching my goal in learning the language.	3.57	0.93	3.38	1.03	0.96	0.34
I set sub-goals for the next stage of learning in the light of how much I can understand and produce when using ICTs to acquire information or communicate with others.	3.57	0.77	3.23	0.98	1.92	0.06
For the areas that I'm weak in, I know how to select and use appropriate ICTs to improve the areas.	3.62	0.95	3.33	1.10	1.40	0.16

Note. Likert scale: 1 = strongly disagree; 5 = strongly agree; all numbers were rounded to the second decimal point.

#### 4.2.6. Social Connection

The last aspect, social-connection regulation, was concerned with the ability "to enhance social connections with and seek help from native speakers and other peer learners around the world" [43] (p. 325). As Table 8 indicates, the *t*-test found no significant differences in the mean scores of the students of different proficiency levels. As the result of descriptive statistics revealed, the students of lower proficiency favored native speakers of target languages more, whereas those of higher proficiency valued peer learners of target languages. This suggests the two groups had different perspectives on social connection with target-language users.

The Taiwanese university students' autonomous English-learning activities with technology are illustrated in Table 9. It was found that 14 out of 47 students of lower proficiency (30%) and 14 out of 52 students of higher proficiency (27%) did not autonomously undertake any English learning activities with technology. For the rest of the students, most chose "watching online multimedia" (25 students of lower proficiency and 22 students of higher proficiency) as a common activity that they did outside the class. They liked to watch English movies and dramas. They would also search for videos on Youtube, one of the most popular online video platforms, and TED Talks. They specifically mentioned two more websites as their video sources: VoiceTube (<https://tw.voicetube.com/>) and HopeEnglish (<https://www.hopenglish.com/video>). Both websites are featured providers of subtitles for videos. Users can choose to have no subtitles, English subtitles, Chinese subtitles, or

English-Chinese subtitles. Other common activities that the students of different proficiency levels would attend included engaging in self-learning activities offered by the university self-learning center and reading online texts.

**Table 8.** Computer Use for Language Learning regarding Social Connection Regulation between Students of Lower Proficiency and Students of Higher Proficiency: *t*-test Results.

Items	Students of Lower Proficiency ( <i>n</i> = 47)		Students of Higher Proficiency ( <i>n</i> = 52)		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
I use ICTs to connect with native speakers of the language	3.09	1.06	3.23	1.20	−0.64	0.53
I use ICTs to connect with peer learners all over the world	2.91	1.04	3.34	1.25	−1.36	0.18
I use ICTs to seek encouragement and support from other learners of the language around the world	2.89	0.94	3.12	1.18	−1.03	0.31

Note. Likert scale: 1 = strongly disagree; 5 = strongly agree; all numbers were rounded to the second decimal point.

**Table 9.** Autonomous English Learning Activities via Technology of Taiwanese University Students of Different Proficiency Levels.

	Students of Lower Proficiency ( <i>n</i> = 47)	Students of Higher Proficiency ( <i>n</i> = 52)
Nothing	14 (30%)	14 (27%)
Watching online multimedia	25 (53%)	22 (42%)
Online communication	Not mentioned	8 (15%)
Self-learning activities at school	4 (9%)	4 (8%)
Reading online texts	3 (6%)	2 (4%)
Taking online English mock tests	Not mentioned	2 (4%)
Learning vocabulary via App	1 (2%)	Not mentioned

Note. The percentage was rounded to the second decimal point.

The students of different proficiency levels respectively mentioned a different autonomous learning activity. In their free time, the students of high proficiency would engage in online conversations with other English users or native English speakers. The following are sample excerpts about their engagement with productive-skill activities:

*"I would use specific apps, like Speaky, to converse with other language learners in English."* (Claire)

*"I joined an online game and communicated in English with other foreign players."* (Johnny)

*"I video-conferenced with native English speakers for chatting."* (May)

*"I browsed online forums and joined interesting discussions to chat and debate with other English users."* (Kevin)

Moreover, the students of higher proficiency would take the initiative to search for online mock language testing resources to prepare for standardized English-proficiency tests, like IELTS, TOEIC, and GEPT, whereas only one student of lower proficiency specifically indicated using Apps to learn vocabulary.

## 5. Discussion

This survey analysis showed that the students of different proficiency levels reacted similarly to the survey items on the autonomous use of technology for English learning, despite having various proficiency levels and learning motivation. Both students of lower and higher proficiency particularly scored the same statements with the highest scores in

terms of goal commitment, resource regulation, and affection aspects. Although previous work reported that autonomous technology use benefitted language learning [18,43,44] and language learners with better learning achievements engaged more in technology use [30], the present study found that students' proficiency levels did not directly have an impact on the amount of autonomous use of technology for language learning. That is, students of higher proficiency would not necessarily be highly engaged in the autonomous use of technology for their L2 learning, and vice versa. Proficiency levels seem not to be a factor in determining the use of autonomous technology for the purpose of language learning. There are possible explanations for the insignificant difference between the two groups. Firstly, as argued by Kumaravadivelu [24], the level of autonomy might not be related to the proficiency levels because, in addition to linguistic and communicative factors, there are other factors, such as socio-political and contextual issues, that could affect the development of autonomy. Next, since technology has been normalized in daily life [35], students in both groups in the current study were familiar with technology. They spent much time using technology (at least three hours a day) and thus were familiar with computer use. They also recognized the usefulness of technology and had good computer efficacy, as can be demonstrated in Table 3 with the means above 3.4. Thus, the two groups' command over technology use was alike. However, having access to online resources does not mean the development of learner autonomy in terms of technology use for language learning. Knowing where to access learning materials does not imply learners' taking action to use them [76–78].

According to Palfreyman and Benson [55], learner autonomy involves the interplay between student learning desires, abilities, and freedom. In the study, the students of different proficiency levels owned the freedom to determine the autonomous use of technology for language learning. Regardless of having higher learning motivation and English abilities, nearly one-third of the participants of higher proficiency ( $n = 14$ ) did not engage in any autonomous learning activities with the use of technology. This percentage was similar to those of lower proficiency ( $n = 14$ ). It is not necessary for students of higher proficiency to autonomously adopt technology for language learning. One possible explanation could be their insufficient training or lack of experience of using technology for second-language learning. When it comes to technology use for language learning, it is crucial to prepare learners to undertake computer-assisted language learning [79,80]. As Smith and Craig [56] and Lai et al. [5] argued, learners need instruction and training to undertake autonomous use of technology resources for language learning. The students in the study, nevertheless, received little instruction and training from their teacher. Their teacher did not actively promote and demonstrate the use of technology for language learning given that the teacher seldom demonstrated how to use technology to learn English (M: 2.96 and 2.79 for the students of lower proficiency and those of higher proficiency, respectively). Thus, numerous students in the two groups were not enthusiastic about seeking the autonomous use of technology for English learning.

Moreover, both groups that autonomously used technology to learn English adopted online multimedia and texts as their common learning activities. They stated their preference over technology specifically for language learning, which is consistent with Zulkepli et al. [40]. To examine the nature of activities, it was found that EFL English learners would prefer receptive activities, such as listening and reading. Yet, practices in productive skills like speaking and writing were less popular. This is in line with previous research, which focused on EFL learners' self-learning English tasks outside of class [45,50,52]. Moreover, the students of higher proficiency levels were engaged in more tasks to practice their productive skills. This can be explained by their higher enjoyment in learning English and their motivation to do so. The participants of higher proficiency levels were more interested in developing different language skills and were more motivated to do so, despite the fact that productive skills require more effort than receptive skills [44]. They would pay attention to balancing both receptive- and productive-skills practices to achieve effective language learning [81]. Finally, the type of activities that the students of higher proficiency

undertook was slightly more than those of lower proficiency did. This is consonant with Lai et al. [18]. The higher-proficiency participants engaged in more varied activities and derived greater pleasure from language learning than the lower.

## 6. Conclusions

The study advanced our understanding of the autonomous use of technology by English language learners, focusing on the impact of proficiency levels on the amount of autonomous technology use for language learning. It was found that the students perceived their autonomous use of technology for language learning similarly, although they had different proficiency levels. This demonstrates that, regardless of having higher proficiency levels, students might not autonomously adopt technology resources for their language learning. Without appropriate training on the autonomous use of technology for language learning, students would not actively seek any opportunities to do so. However, students of higher proficiency and more enjoyment in language learning would engage in more diverse activities to self-direct their technology use for language learning. They would focus on balancing language input and output practices and engage in relevant activities by means of technology.

The study findings imply that the impact of proficiency difference was not much concerned with students' self-regulated use of technology for English learning. Students had a good command of technology and felt comfortable using it. Yet, proper training and effective class instruction on technology use for language learning are needed to encourage more engagement in autonomous English learning activities via technology. In addition to knowing what online learning resources students have access to, it is also important to acquire knowledge about how to use them for the development of learning autonomy. Furthermore, students of different proficiency levels would have to develop regular habits of learning English and attending more autonomous learning activities. A crucial step is to support students in broadening their knowledge of and access to useful technology-enhanced materials for English learning, and then encourage them to engage more in exercises related to writing and speaking skills, thus fostering both receptive and productive aspects of the language.

Limitations in the study minimized the generalization of the results, such as convenient sampling, low number of participants, fuzzy proficiency levels without listening and speaking abilities information, and a single data collection instrument (i.e., a survey in the current study). Furthermore, information about the participants' autonomy in English learning was not collected, which may be an important independent variable for consideration. Finally, participants might answer surveys hastily. These limitations need to be overcome in future studies, including recruiting more participants for complex statistical analyses. Moreover, standardized English language assessment can be used to precisely operationalize student proficiency levels in future studies. Further studies are needed to examine student development of autonomous technology use for language learning over a longer period of time by conducting longitudinal observations. Moreover, future studies should consider the established method of initial questionnaires used to devise questions posed in follow-up focus groups and interviews so as to collect more in-depth views on students' autonomous use of technology in English learning. Other variables, such as learners' gender, motivation to learn a second language and their linguistic contexts can be explored. Additionally, future studies could examine the impact of different types of learning activities through technology on learning achievement and explore teachers' perspectives on how to support students to develop autonomous technology use for language learning.

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