Integration of Social-Aedia-Apps into
Second Language Learning Activities to Improve Critical Thinking in Chinese Foreign Language Learning

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សង្ខិត្តន័យ

ជារឿយៗ កម្មវិធីបណ្ដាញសង្គមត្រូវបានគេប្រើជាធនធានសិក្សាឌីជីថល ដើម្បីលើកកម្ពស់បំនិនការគិត គ្រប់ជ្រុងជ្រោយ ក្នុងអំឡុងពេលសិក្សាភាសាទី២ (L2)។ ការគិតគ្រប់ជ្រុងជ្រោយជាបំនិនចាំបាច់ដើម្បីធ្វើ ឱ្យការរៀនសូត្រ L2 មានភាពប្រសើរឡើង។ ការសិក្សានេះមិនត្រាន់តែពិនិត្យការធ្វើសមាហរណកម្មនៃកម្ម វិធីបណ្ដាញសង្គម ដើម្បីធ្វើឱ្យប្រសើរឡើងនូវការសិក្សាភាសាទី២ ប៉ុណ្ណោះទេ ប៉ុន្តែវាក៏បង្ហាញឯងដែរពីការ ប្រក្ខតប្រជែងសមត្ថភាពទាក់ទងនឹងការយល់ដឹង។ ការសិក្សានេះបានប្រើវិធីសាស្ត្រចម្រុះបញ្ចូលគ្នា រវាង គេស្ទុបរិមាណវិស័យនិងក្រុមពិភាក្សាបែបគុណវិស័យដើម្បីប្រមូលទិន្នន័យ។ លទ្ធផលបានបង្ហាញថា កម្ម វិធីបណ្ដាញសង្គម ដែលប្រើនៅលើកុំព្យូទ័រផ្ទាល់ខ្លួននិងទូរស័ព្ទចល័ត មានសក្តានុពលក្នុងការផ្លាស់ប្តូរ ឥរិយាបទរបស់អ្នកសិក្សា L2។ ការផ្លាស់ប្តូរនេះរួមមាន ការដាក់បញ្ចូលការសិក្សា L2 ទៅក្នុងជីវិភាពប្រចាំ ថ្ងៃ ការបង្កើតរបៀបថ្មីសម្រាប់ការសិក្សា L2 របៀបបកស្រាយ L2 និងការបង្កើតឱិកាសសម្រាប់អ្នកសិក្សា L2 ទាក់ទងគ្នាទៅវិញទៅមក និងបង្កើតទំនាក់ទំនងថ្មីៗដោយប្រើភាសាដែលពួកគេបានរៀន។ ជាងនេះ ទៅទៀត លទ្ធផលគូសបញ្ជាក់ថា ការដាក់បញ្ចូលកម្មវិធីបណ្ដាញសង្គមជាមួយធនធានសិក្សាផ្សេងទៀត ធ្វើឱ្យមានការខិតខំពេញទំហឹងដើម្បីទទួលបានការយល់ដឹង L2។ កម្មវិធីបណ្ដាញសង្គមដូចជា Wechat, QQ, LinkedIn, Wiki និង Weblog អាចជួយបង្កើនការយល់ដឹងរបស់អ្នកសិក្សា L2 ផង និងជួយឱ្យសិស្ស មានឥរិយាបថល្អចំពោះការរៀនសូត្រ។ ជារួម កម្មវិធីប្រព័ន្ធផ្សព្វផ្សាយសង្គមត្រូវបានប្រើប្រាស់ដើម្បីជួយ សម្រួលដល់ការសិក្សាភាសាទី ២ ផ្ដេរចំណេះដឹង វាយតម្លៃការរៀនដោយខ្លួនឯង បញ្ចូលបំនិនក្នុងការគិត សព្ទជ្រុងជ្រោយក្នុង SLA និងធ្វើឱ្យអ្នកសិក្សាខិតខំអស់ពីសមត្ថភាព។

Abstract

Social-media-apps are often used as the digital learning resources to promote critical thinking skills during the acquisition of a second language (L2). Critical thinking is a vital skill to improve L2 learning. This study examines the integration of social-media-apps to improve the acquisition of a second language, but also shows this presents challenges in

terms of cognition. This mixed-method study uses a combination of quantitative testing and qualitative focus groups to collect data. The results demonstrate that social-media-apps used on personal computers and mobile phones have the potential to change the behavior of L2 learners. This includes integrating L2 learning into their daily life, creating new ways of acquiring a L2, the ways a L2 is interpreted, and creating opportunities for L2 learners to interact and develop new relationships in their acquired language. Moreover, the results highlight that integration of social-media-apps provides challenges in terms of cognition L2. Apps, such as Wechat, QQ, LinkedIn, Wiki, and Weblog enhance the cognition of L2 learners and student attitudes towards learning. Particularly, social-media-apps are used to facilitate second language acquisition, transfer knowledge, assess self-learning, integrate critical thinking skills within SLA, and provide challenges for L2 learners.

Keywords: social media-apps, computer-apps, mobile-apps, web-apps, app-frameworks, critical thinking

Introduction

Second language acquisition (SLA) is complex for non-native learners to master. The integration of SLA with the daily challenges that improve cognition requires teaching and learning pedagogies to be adopted (Beal & Strauss, 2009). Instead of focusing on improving the delivery of L2 learning, social-media-apps are currently being used as social digital platforms, which have the potential to change the cognition of L2 learners to improve their performance (McFarland & Ployhard, 2015). Social-media-apps used on personal computers and mobile phones have the capacity to present the regular learning challenges required to improve student cognition and change student attitudes towards SLA (Than, 2018). Social-media-platforms may be considered as the modern technology that represents a range of new contexts that are essential for improving the way L2 learners communicate. Traditional communication pathways are complemented with online-integration through wikis, e-messages, and translation apps. This communication facilitates knowledge transfer between learners, improving SLA outcomes (Warner and Chen, 2017).

Social-media-apps, such as Wechat, QQ, LinkedIn, Wiki, and Weblog have revolutionized SLA via changes the ways L2 learners can connect and communicate (Kaplan & Haenlein, 2010; Lenhart et al., 2010). For instance, Elefant (2011) discusses how social-media-apps facilitate information sharing, learner-created content, and collaboration among L2 learners. Fernando (2010) outlines how sharing information between individual profiles on social networking platforms improves the L2 cognition of learners (Charalambousa & Ioannou, 2011), as well as

changing their attitudes towards learning. This is more likely to occur when L2 learners are encouraged to integrate social-media-apps into their L2 learning activities (Ushiioda & Dörnyei, 2017).

Derks and Bakker (2013) conduct a review of literature on social-media integration within L2 learning. It suggests that L2 learners are successfully using social-media-apps to improve their critical thinking an thus, improve their SLA outcomes through the use of online learning platforms, such as professional development websites (Mayer, 2002). The integrative tools on these websites have a multi-modal capacity and incorporate a wide range of digital information, including photographs and videos. They provide students with an opportunity to integrate SLA within their social networks (Beach & Willows, 2017). Furthermore, online learning modalities enable teachers and researchers to better understand the attitudes of learners, as cognitive process can be monitored on online platforms. With knowledge of how L2 learners integrate in online environments, teaching practices can be improved (Duncan-Howell, 2010).

Weschke, Barclar, and Barclay (2011) identify both positive and negative aspects of online learning opportunities with respect how the type of content students can access their learning outcomes change. Online learning tools are essential for accessing the new type of content required for this change, provided that situational barriers are removed (Kanunka & Nocente, 2003). Notably, website content enables students to integrate opportunities for professional development with the strategies for acquiring a L2. This can also be integrated with improvements in L2 cognition (Kao, Wu, & Tsai (2011). In the respect, social media platforms are a technology that facilitates SLA through learning activities, such as knowledge creation and knowledge sharing in collaborative online learning communities (Bonsón & Flores, 2011; Daghfous & Ahmad (2015). This inspires a level of creativity among individual learners, their peers, and teachers (Peppler & Solomou, 2011). Personal computers and mobile phones can be used to access a range of linked apps, such as dictionaries, wikis, and blogs, which can also be integrated into L2 learning activities. Students can use these apps to produce learning materials or interpret their target language, which again improves cognition (McNulty, Sonntag, & Sinacore, 2009). In this way, L2 courses may use mobile apps (Hamakali, 2017), of more specifically, integrative mobile-apps (Hannon, 2017) to enhance SLA through improved knowledge transfer.

Guze (2015) suggests that modern technologies are crucial learning tools, which are integration into L2 learning activities to present learning challenges. This is linked to ideas presented in the literature of Internet welfares, which describes social benefits that may be realized by integrating mobile-apps into L2 learning activities to improve the critical thinking required for SLA (Than, 2018). For example, smartphones enable access to new learning materials, which can be integrated into L2 learning activities to improve cognition and language retrieval (Trelease, 2008). This cognition may be reinforced through integrative self-guided quizzes and self-learning assessments (Karpicke & Blunt, 2011). Although social-media-apps incorporate a wide range of tools and technologies, the individual L2 learners are easily able to embrace them to resolve cognitive challenges (Mangold & Faulds, 2009).

Internet technologies and social media have attracted considerable attention in terms of SLA (Hanna, Rohm, & Crittenden, 2011). In L2 learning activities, social-media-apps should shape new challenges and opportunities for individual long-life learning (Kietzmann et al., 2011). Indeed, the integration of social-media-apps into L2 learning activities is shaped by how L2 learners interact with the learning materials sourced within them (Colliander & Dahlén, 2011; Cho et al., 2014). Social-media-apps have been shown to enhance the cognitive relationships between L2 learners, which leads to increased commitment to learning, levels of satisfaction, and perceived value in acquiring a second language (Gambao & Gonçalves, 2014). In recognition of this, Akar and Topçu (2011) analyze how L2 learners perceive the changing role of social-media-apps in their L2 learning activities through the creation of an attitude scale. The scale is intended to be used to assess how attitudes change into the future as well. It comprises the indicators that examine user perceptions about their learning attitudes, acceptance of social-media-apps in the learning, the use of social-media-app, how this influences their knowledge, their views of being monitored, and fears associated with the use of social-media-apps.

Likewise, de Valck, van Bruggen, and Wierenga (2009) investigate how the decision-making processes of L2 learners is impacted by the use of social-media-apps within L2 learning activities in terms of learner interactions, communication, and information sharing. This forms part of a broader conceptual framework used to identify how social-media-apps support SLA in conjunction with other technologies, based on a set of individual and social behavioral models (Ngai, Moon, Lam, Chin, & Tao, 2015). Chen, Fay, and Wang (2011) argue that aspects of critical

thinking, such as setting learning expectations, regulation of online behaviors, and the levels of maturity among social-media users are key factors that influence the successful integrating social-media-apps into L2 learning activities. Cascio and Aguinis (2008) pose that the integration of social-media-apps into L2 learning is part of a global phenomenon that requires greater scientific scrutiny. They suggest that this phenomenon has the potential to devalue some of the psychological benefits of SLA, such as cognitive creativity or creativity pursuing L2 learning challenges to improve cognition.

The present study examines the impacts of the integration of social-media-apps into L2 learning activities related to the enhanced cognition of L2 learners. It looks at how social-media-apps influence L2 learning outcomes. The use of social-media-apps is considered in terms of a contextual framework outlining of student-centered theory and practice, and it role in transforming L2 learning behaviors and outcomes. The framework considered factors, such as social exchange, social contagion, as well as social network theories and practices (Reinhardt & Ryu, 2013) with a focus on better understanding how social media-apps are integrated into L2 learning activities and how this influences the critical thinking skills of L2 learners (Than, 2018). The following research questions are asked: (1) To what extent do social-media apps impact on L2 learners? (2) What are the effects of social-media-apps on the critical thinking process of L2 learners? (3) What student capacities and attitudes are strengthened through the integration of social-media-apps into L2 learning activities? (4) How L2 learners can use learning challenges to improve their L2 cognition through the use of social-media-apps?

Research Methodology

A mixed-method approach was employed for this study, using tests, semi-structured interviews with individual respondents, and focus-group discussions. Shandong University was selected as the research site based on it being a well-established university that attracted both local and international students from a diverse range of countries. The university is well aligned with the strategy and policy of the Ministry of Education and the Chinese Government. Two undergraduate English classes from the School of Foreign Languages and Literature were selected as the participants. The cohort comprised 65 students (38 females) of varying levels of English language proficiency. The participants were divided into control group (CG) and experimental

group (EG), with the aim of investigation the effects of integrating social-media-apps into L2 learning activities, with respect to the development of critical thinking skills.

Participants, selected at random, were asked to sit a pre-test on the 14th of October, 2017, with focus-group discussions and individual interviews conducted one week later. Post-tests were also conducted at this time. The individual interviews were used to confirm the validity of the tests. As part of the interviews, the researcher asked the participants to describe the effects integrating of social-media-apps into L2 learning activities, particularly in terms of how this had challenged their learning and helped them to think critically.

The tests were designed to assess the L2 proficiency of the students and gain insight into how the features available within social-media-apps may best be integrated into L2 learning activities in line with the research questions. The test comprised a 45 minutes writing activity (Padmanaban & Tragoudas, 2003). The researcher used the results of these tests to understand how the integration of social-media-apps into L2 learning activities had improved learning outcomes, cognition, and critical thinking capacity. The pre-test was used a baseline to compare post-test results with during analysis.

A semi-structured questionnaire was used to obtain information from L2 learners about their perceptions of social-media-apps and their integration into their learning activities, and how this had changed their way they thought (Masadeh, 2012). The individual interviews were conducted with 20 participants. The interviewees were requested to express their ideas freely and in 10 minutes to describe their backgrounds and their perceptions of social-media-apps within their L2 learning activities, in particular, how this had advanced their critical thinking. The transcribed interviews were considered as the supplementary source of data (Marczak & Sewell, 2007).

Mixed-methods-content analysis was used to analyze the data gained from the tests, using various approaches including practicality analysis (Plonsky &Gass, 2011) and a comparison of paired-sample t-tests. The quantitative analysis was deductive and intended to test hypotheses, or questions generated from theories and previous empirical research. The qualitative analysis was inductive, grounded in the examination of topics and themes, as well as drawing inferences.

Data sampling techniques for each type of analysis were different. The quantitative analysis used random sampling producing numbers that could be manipulated with various statistical methods. Data gathered from both pre-tests and post-tests were analyzed by using SPSS 21.0 software to enable a comparison of paired-sample t-tests – focused on the correlation of different variables. The qualitative analysis used purposively selected data to inform the research questions by interpreting the interview transcripts in terms of L2 learner perceptions, as well as their background knowledge of L2 learning activities and the integration of social-media-apps within them to improve L2 learning outcomes and critical thinking capacity. To be with, the interview transcripts were checked for accuracy. Responses were classified based on the questions asked, before being entered into a Microsoft Excel spreadsheet. This was helpful for the researcher to analyze and interpret the interviews based on the research questions and was then used to process information about student perceptions and their background knowledge.

Findings and Results

The Impacts of social-media-apps on SLA

An interpretation of interview transcripts was provided in Table 1. Most interviewees expressed difficulties with respect to SLA. The interviewees, however, responded that social-media-apps were effective in integrating social-media-apps into their lessons, providing appropriate challenges for improving cognition and critical thinking. The interviewees described social-media-apps as a modern technological social platform and claimed that social-media-apps provided opportunities to integrate L2 learning activities with other means of interacting and communicating. They described the use of wikis, e-messages, and translation apps in their L2 learning activities as changing the way they learned.

The focus-group discussions found that most interviewees suggested that they could improve their L2 cognition and acquired a L2 more quickly if they used social-media-apps on computers or mobile phones as part of their learning (see Table 1). Social-media-apps were described as the social digital platforms that integrate L2 learning with L2 cognition. This included "the improvement of L2 learning outcomes, self-learning assessment, the use of critical thinking, the use of learning materials, self-guided quizzes, and a wide range of other support tools." Most

interview participants used social-media-apps to "integrate and improve their L2 learning strategies, challenge their L2 learning approaches, improve their cognition, interpret language, enhance the co-operative relationships, develop loyalty, experience learning satisfaction, value different perspectives, and increase their commitment."

Table 1. An interpretation of interviewees-responses.

Factors	Control Group	Experimental Group
What are the difficulties in your learning?	L2 learning	L2 learning, critical thinking
What do you use to solve the difficulties in your L2 learning and critical thinking?	Social-media-apps	Computer-apps, web-apps, and mobile-apps
The social-media-apps are defined as …	Social digital platforms, modern technologies	Digital learning resources, web-sites, modern technologies
What do you use social-media-apps for?	Improvement of L2 learning outcomes, self-learning assessment	The use of critical thinking, the use of learning materials, self-guided quizzes, a wide range of other support tools
Why do you use social-media-apps?	To improve L2 learning strategies, challenge my L2 learning, interpret language, improve my cognition, and enhance co-operative relationships	To integrate L2 learning strategies, challenge my critical thinking and L2 learning, develop loyalty, experience learning satisfaction, value different perspectives, and increase my commitment
What apps of computer-apps, web-apps, and mobile-apps do you use to integrate the L2 learning and challenge the critical thinking?	Wechat, QQ, LinkedIn, Wiki, and Weblog	Wechat, QQ, LinkedIn, Wiki, and Weblog
What are the effects of social-media-apps on your L2 learning and critical thinking?	Interpreting the language meanings, integrating L2 learning strategies, changing ways of interacting and communicating, using Internet to access professional L2 learning opportunities, facilitating information sharing and collaboration with other	Creating new ideas, challenging my L2 learning both inside and outside the class, facilitating SLA and knowledge transfer, enhancing L2 learning cognition, changing the way to connect and communicate, enabling cognitive processes to be tracked, enabling student-created content, and

learners, facilitating SLA and knowledge transfer	facilitating collaborating between learners

Wechat, QQ, LinkedIn, Wiki, and Weblog" were the social-media-apps most used by L2 learners to develop L2 learning challenges that improved their level of critical thinking. Social-media-apps were found to have provided participants with many benefits with respect to L2 learning challenges. This included challenging the way they interpreted language and identified new L2 learning strategies and changing the ways they interacted and communicated, used the Internet to access and find information about professional learning opportunities, and facilitated information knowledge sharing and collaboration opportunities with other L2 learners. Social-media-apps were also used for knowledge transfer, creating new ideas, challenging student L2 learning both inside and outside the classes, and enhancing cognition. Social-media-apps were regarded as the modern technologies that integrated new L2 learning activities with the development of critical thinking skills to assist with SLA. The effect of social-media-apps was described as "changing the way students connect and communicate, enabling cognitive processes to be tracked, enabling student-created content, and facilitating collaborating between learners.

Table 2. Correlations between experimental group (EG) and control group (CG).

Pair	Factors	N	Correlation	P-*value*
1	Computer-apps	65	.429	.216
2	Web-apps	65	.602	.065
3	Mobile-apps	65	.160	.659

*P-*value* < 0.005, **P-*value* < 0.001.

A comparison of the types of social-media-apps used and their significance in terms of their integration with L2 learning activities for the EG and CG was presented in Table 2. The computer-apps (*P*-value = .216) helped cognition for the EG, but the CG demonstrated less development of critical thinking skills relevant to L2 learning activities.

Web-apps (P-value = .065) significantly supported the EG to develop critical thinking skills within L2 learning activities, while the CG only slightly improved their cognition using these tools. Mobile-apps (*P*-value = .659) enabled the EG to greatly improved their cognition, however they were not well-integrated with the L2 learning activities of the CG (see Table 2). With respect to

correlations between the EG and CG, the SLA was improved through integrating critical thinking skills into L2 learning activities through the use of computer-apps, web-apps, and mobile-apps. That is to say, while the correlation varied for each type of L2 learners were able to improve their level of critical thinking, regardless of the type. Both groups also used each type of app to facilitate information sharing, create learning content, collaborate with learners, and transfer knowledge.

Table 3. Comparison of paired sample t-test for the EG and CG.

Factors	Pair	N	Paired Differences			
			Mean	Std. Derivation	t	P-*value*
Computer-Apps	1	65	3.470	5.15925	2.127	.062
Web-Apps	2	65	6.450	4.48683	4.546	.001**
Mobile-Apps	3	65	7.410	6.17134	3.797	.004*

*P-*value* < 0.005, **P-Value < 0.001.

The comparison of L2 learning activities for each type of social-media-app for the EG and CG in Table 3 identified each was significant for L2 learners. The *P*-value of (.062) for computer-apps showed that the EG students experienced greater improvement in their cognition than the CG, when these apps were used to integrate critical thinking into L2 learning activities. The *P*-value of (.001**) for web-apps found that both the EG and CG improved cognition equally by using the internet as the digital platform for L2 learning (see Table 3). The *P*-value of (.004*) for mobile-apps sought that there was no difference between the EG and CG in terms of improving L2 learning activities with mobile phones.

Comparing the paired sample t-tests identified that the EG were able to improve their SLA more quickly than the CG by using computer-apps to improve cognition. It also showed that both groups used all three types of apps to improve their critical thinking skills. Both groups used social-media-apps to create new ideas, facilitate SLA, transfer knowledge, enhance and track their cognition processes, change the way they connect and communicate, develop content, and collaborate with other learners.

Student capacity in using social-media-apps

The capacity of students to integrate social-media-apps into their L2 learning activities to challenge their level of critical thinking was found to be significantly improved by goal-setting using social-media-apps on either computers or mobile phones (Tables 4 and 5). Self-motivation and self-assessment were other factors found to encourage students to improve their L2 learning activities using social-media-apps. This helped L2 learners create learning challenges to improve their critical thinking by themselves.

Table 4. Correlations of student capacity to use social-media-apps for SLA.

Pair	Factor	N	Correlation	P-*value*
1	Goal-Setting Plan	65	-.596	.069
2	Self-Motivation	65	-.666	.036
3	Self-Assessment	65	-.101	.782

*P-*value* < 0.005, **P-Value < 0.001.

The correlation value of -.596 and *P*-value of .069 for comparing the goal-setting plans for the EG and CG suggested that EG used goal setting to a greater extent than the CG, with respect to using social-media-apps to improve their L2 cognition. The correlation value of -.666 and *P*-value of .036 for self-motivation showed that the EG had higher levels of self-motivation than the CG with respect to the use of social-media-apps to improve their critical thinking (see Table 4). The correlation value of -.101 and *P*-value of .782 for self-assessment sought that the EG self-assessment to a larger extent than the CG in relation to use social-media-apps to improve SLA cognition. L2 learners were encouraged to use social-media-apps as digital learning resources to access information on the Internet about professional L2 learning opportunities through platforms, such as Wechat, QQ, LinkedIn, Wiki, and Weblog. This assisted to improve their level of critical thinking in terms of SLA, enable them interpret language, create new ideas, and transfer knowledge more easily.

Table 5 presented the statistical significances of different student strategies to improve their capacity in using social-media-apps. The *P*-value of .377 for goal-setting plans of the EG and CG realized that when using social-media-apps to improve their use of critical thinking in SLA, EG students made greater use of these plans. The EG were more self-motivated (*P*-value = .015) and

used self-assessment to a greater extent (*P*-value = .013) to identify L2 learning challenges to improve their critical thinking skills through the use of social-media-apps. In turn this was shown-improved their SLA. While there was a significant variance in how social media-apps were used, both groups had opportunities to use the apps in all aspects of their L2 learning activities. That is to say, both groups had the opportunity to integrate critical thinking skills to facilitate SLA, interpret language, create new ideas, and transfer knowledge.

Table 5. Student capacity in using social-media-apps.

Factors	Pair	N	Paired Differences			
			Mean	Std. Derivation	t	P-*value*
Goal-setting Plan	1	65	2.590	8.82313	.928	.377
Self-motivation	2	65	5.530	5.83591	2.997	.015
Self-assessment	3	65	5.910	6.06968	3.079	.013

*P-*value* < 0.005, **P-Value < 0.001.

The impact of social-media-apps on SLA

An analysis comparing the EG and CG through paired sample t-tests using the data gathered from the pre- and post-tests was presented in Tables 6 and 7. In this instance, social-media-apps were defined as the digital learning platforms for improving the use of critical thinking as part of L2 learning activities. The correlation and *p*-values derived from the test scores of the EG and CG (Table 6) provided insights into the development of critical thinking skills through the use of social-media-apps for L2 learning activities.

Table 6. The correlation between the use of social-media-apps and their influence on SLA.

Pair	Test	N	Correlation	P-*value*
1	Pre-Test	65	.417	.231
2	Post-Test	65	-.305	.391

*P-*value* < 0.005, **P-Value < 0.001.

Both the EG and CG had similar learning challenges and capacities. However, the EG were able to acquire second language skills more quickly using social-media-apps integrated into their

L2 learning activities to develop critical thinking skills (*P*-value =.391). In addition, EG learners had developed a higher level of SLA as well (P-value (p=.391).

Table 7 presented the results of the paired difference analysis of the pre-tests and post-tests of the EG and CG. The *P*-value of .004* for the pre-tests suggested significant differences in level of improvement and cognition as a result of integrating social-media-apps into L2 learning activities. In contrast, the *P*-value of .141 for the post-tests showed statistically significant variance in the development of learners using social-media-apps. Even though these results were different, each group was able to apply the integration of social-media-apps into their L2 learning activities for SLA through knowledge transfer, creating learning content, using the Internet to find information, interpreting language, creating new ideas, and improving cognition. Thus, by using social-media-apps, L2 learners were able to improve their critical thinking skills to improve their learning behaviors and attitudes.

Table 7. Paired sample t-tests on the influence of social-media-apps on SLA.

Test	Pair	N	Paired Differences			
			Mean	Std. Derivation	t	P-*value*
Pre-test	1	65	5.350	4.41695	3.830	.004*
Post-test	2	65	2.950	5.78613	1.612	.141

*P-*value* < 0.005, **P-Value < 0.001.

Student attitudes towards social-media-apps

The mean (2.640) and P-*value* (0.123) for student achievement showed that the EG realized a greater level of achievement through the use of social-media-apps than the CG (see Table 8). The EG also displayed better attitudes towards social-media-apps (mean = 2.550; P-*value* = 0.224, see table 8). If students integrated social-media-apps with their L2 learning activities, then they had enough opportunity to improve their abilities and attitudes, such as creating new ideas and learning content, interpreting language, and transferring knowledge. Through integrating critical thinking into their L2 learning activities, L2 learners identified that using social-media-apps helped them enhance L2 learning aspects, such as self-motivation, self-reflection, self-guidance, and self-assessment.

The mean (2.560) and P-*value* (0.188) for student behaviors and outcomes relevant to the integration of social media-apps into their L2 learning activities compared this attribute across

the EG and CG. A significant variance in whether improved L2 learning behaviors and outcomes were improved was observed. This included whether being an active learner changes L2 learning behaviors such as connection and communication with other learners or whether students to challenges that improve their cognition. Both the EG and CG had sufficient opportunities to develop their learning behaviors and outcomes in the study, such as learning collaboratively and using social-media-apps to interpret language.

Table 8. Comparison of student attitudes towards social media-apps.

Attributes	Pair	N	Paired Differences			
			Mean	Std. D	t	P-*value*
Student achievement	1	65	2.640	4.89993	1.704	0.123
Student attitudes towards social media-apps	2	65	2.550	6.17778	1.305	0.224
Student behaviors and outcomes in relation to social-media-apps	4	65	2.560	5.68393	1.424	0.188
Student attitudes toward L2 learning activities	5	65	.870	1.99223	1.381	0.201

*P-*value* < 0.005, **P-Value < 0.001.

The mean (.870) and P-*value* (0.201) for student attitudes towards L2 learning activities among the EG and CG for the paired sample t-tests also suggested significant variation in the improvement of student attitudes toward L2 learning activities through the use of social-media-apps (see Table 8). The EG were able to quickly develop their SLA due to their attitudes toward L2 learning activities conducted on social-media-apps whereas the CG were not. Both groups were encouraged to integrate the apps, such as Wechat, QQ, LinkedIn, Wiki, and Weblog into their L2 learning activities to improve their cognition, confidence, and awareness of their SLA, as well as whether they were matching the description of an active learner.

Discussion

The results of this study show that many L2 learners integrate social-media-apps, such as Wechat, QQ, LinkedIn, Wiki, and Weblog into their L2 learning activities to realize benefits such as improving cognition and critical thinking. To be able to continue to adapt these technologies

and innovate further, it is useful to access insights into how L2 learners use social-media-apps in higher education across both the sciences and social sciences. Social-media-apps are found to provide L2 learners with significant opportunities to challenge their approaches to learning and become active learners (see Tables 1, 2, and 3). L2 learners are found to use social-media-apps to find new ways of communicating, interacting in their target language, interpreting language, and creating new concepts. Indeed, most L2 learners demonstrate that social-media-apps can be used as a social digital platform to improve their cognition (see Tables 1, 2, and 3). Moreover, L2 learners use social-media-apps to improve their performance in L2 learning activities. Several L2 learners also use social-media-apps to enhance their L2 learning behaviors, such as building relationships to communicate with other learners, increase loyalty and commitment to their studies, and become for satisfied with the perceived value of their learning.

The present study also shows how the integration of social-media-apps helps L2 learners improve their capacity (see Tables 4 and 5). Social-media-apps are viewed as the digital learning resources, which may be assigned to L2 learners to present them with challenging learning activities that improve their cognition. Indeed, social-media-apps have provided L2 learners with significant opportunities to set their own L2 learning goal, become self-motivated, and assess their own performance. This provides new learning challenges that improve critical thinking. By comparing the EG and CG, significant value was observed in terms of the integration of social-media-apps, based on the results from the test scores. This is relevant to L2 learner capacity to use social-media-apps, such as Wechat, QQ, LinkedIn, Wiki, and Weblog to transfer knowledge, assess self-learning through self-guide quizzes, search for information, and interpret language to facilitate SLA, as well as improve L2 cognition and learning attitudes.

Social-media-apps serve as digital learning platforms for L2 learners to access challenges to improve their cognition and critical thinking in the context higher education setting. For instance, social-media-apps increase the perceived value of learning and promote loyalty, satisfaction, and a high commitment to learning. Social-media-apps provide learners with substantial opportunities to improve their learning outcomes. Benefits included improving cognition through a capacity to interpret language, transfer knowledge, and create new ideas with enhanced technology. Similarly, social-media-apps help L2 learners develop useful perspectives for improving their understanding of their target language through improved

behaviors and attitudes. Additionally, the integration of social-media-apps into L2 learning activities fits with the contextual framework that shows how learner-centered theories are applied to enact changes to behaviors. This may be demonstrated through social exchange and social networking theories, for example, social-media-apps are suggested to be effective within these frameworks as they promote the essential behaviors of self-motivation and self-assessment to improve critical thinking. Even though there are differences between the experiences of the two groups, both are able to demonstrate this behavior through creating learning content, interpreting language, developing new ideas for L2 learning activities, and transfer knowledge for SLA.

If students integrate social-media-apps into their L2 learning activities, collaborative L2 learning opportunities are created, where knowledge can share with communities to extend its effectiveness in creative ways. Most L2 learners use social-media-apps as digital learning resources to improve their behaviors, attitudes, and L2 cognition. This acts to shape student interactions and communication. Indeed, the student attitudes improve on the learner-based attitude scale because L2 learners have changed their learning behaviors and attitudes both inside and outside the classroom. L2 students are encouraged to be aware of their use of social-media-apps and to be confident in their own experience of SLA. Consequently, L2 learners are able to apply social-media-apps to realize outcomes associated with this improved cognition, such as being more aware and confident with their L2 learning and taking a more active role in their learning. In fact, learning integrated with social-media-apps assists L2 learners to improve their language learning through shaping their own advancement led by changed behaviors and attitudes and improved critical thinking skills.

In conclusion, there is both theoretical and practical basis for integrating social-media-apps, such as Wechat, QQ, LinkedIn, Wiki, and Weblog into L2 learning activities, as a way of improving the experience of SLA. Indeed, the relationships between L2 learners through social-media-apps are found to improve levels of critical thinking, which act to evolve the cognition of L2 learners through new challenges. Social-media-apps are demonstrated to change the ways L2 learners approach learning through learner-centered approaches. This promotes new learning behaviors and outcomes. Ultimately, L2 learners use social-media-apps to participate in learning activities, such as creating learning content, interpreting language, creating new ideas, self-

learning, self-assessing to facilitate SLA, transferring knowledge, and improving their level of critical thinking. L2 learners also use social-media-apps to search information about professional development opportunities, to improve L2 cognition and their attitudes to learn through enhanced relationships. These enhance relationships increasing their level of satisfaction, commitment, and perceptions of value, with respect to their education.

Conclusion

The study examines the effects of integrating social-media-apps into L2 learning activities to improve the cognition of learners. Social-media-apps are defined as social digital platforms used to facilitate the learning activities for the purposes of this study, including Wechat, QQ, LinkedIn, Wiki, and Weblog. This trend is a global phenomenon and requires scientific scrutiny in terms of how well it is integrated with psychological concepts, such as higher critical cognition, cognitive creativity, and challenging learning activities. Social-media-apps are indented to enhance and develop deeper learning relationships, with increased loyalty, leading to greater satisfaction with the learning process, increasing the perceived value of L2 learning and thus, the commitment of learners. Social-media-apps noticeably change the ways L2 learners approach SLA including the ways they communicate, interact in their target language, interpret language, and create new concepts. It also promotes self-learning, knowledge transfer, and self-assessment using quizzes to facilitate SLA. Overall, this examines how students search relevant information to identify challenging L2 learning activities to enhance their critical thinking, cognition, and attitudes towards learning.

Descriptive statistics were provided with respect to the most significant attributes of the integration of social-media-apps into L2 learning activities to promote critical thinking. However, not enough evidence was gathered to sufficiently understand the most important attributes. This study did cover a large enough cohort to be of significance. The methodology used was not sufficient to draw strong conclusion about these attributes. This study suggests that social-media-apps should continue applied to L2 teaching activities guided by higher education pedagogies in all contexts to improve L2 cognition. L2 learners should be encouraged to integrate social-media-apps into their L2 learning activities.

Further study on the integration of social-media-apps to improve critical thinking outcomes is strongly encouraged for researcher across a range of fields. This study illustrates how social-media-apps challenge traditional ways of L2 learning and looks at the strategies by which critical thinking skills may be encouraged through the provisions of a stimulating learning environment. It is believed that further study in this area will unveil promising result for future generation.

Corresponding Biography

Chhorn Than has a background as a high school English teacher, however more recently, he has worked as a lecturer at the Cambodian University for Specialties (CUS) and the University of Heng Samrin Thbongkhmum (UHST). He holds of Bachelor of Teaching English as a Foreign Language, from Western University in Phnom Penh and Masters of Teaching English to Speakers of Other Language from the Cambodia University of Specialties. His research interests include the role of technology in improving language proficiency and critical thinking skills. He is currently pursuing a doctorate in foreign linguistics and applied linguistics with the School of Foreign Languages and Literature at Shandong University in China.

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