The Role of Duolingo in Foreign Language Learners' Autonomous Learning

Charlene Chiao-man Tsai, National Taiwan Normal University, Taiwan

Abstract

Duolingo, a free language learning software, is lessoned by units semantically and grammatically with different activities (translation, matching, speaking and listening), and available both on the computer and on the mobile phone. As language learning software like Duolingo becomes more and more popular in language learning, Benson (2013) suggested that the modern concept of learner autonomy (LA) has to be "reconceptualized" due to the changing of the way learners learn foreign languages. This study investigated whether Duolingo could help learners promote learner autonomy and to what extent could LA be achieved. Ten college students were selected to participate in this study. Both qualitative and quantitative tools were used, with qualitative as the main and quantitative as the supplementary. The study was carried out in two phases. Quantitative tool was applied in phase one with self-initiated and self-regulated questions and Duolingo's learning logs tracker. Participants involved in phase two, a semi-structure interview, were selected depending on participants' phase one result to obtain in-depth information about to what extent LA be achieved, the transfer of learners' metacognitive strategies in learning, and the interesting features of Duolingo that prompted LA. The results showed that learners promoted LA by managing their leisure time and the daily goal of learning period, looking for more information to solve their problems, selecting related materials, and evaluating the performance and achievement of themselves. Pedagogical implications for promoting LA with language learning software were also discussed.

Keywords: Learner Autonomy, Computer-Assisted-Language Learning, Foreign Language Learning

iafor

The International Academic Forum
www.iafor.org

Introduction

The essential relationship between learner autonomy and language learning has long established (Dam, 1995; Holec, 1980; Little, 1996). Dam (1995) acknowledged that the development of learner autonomy is essential for a learner to succeed. To become an autonomous learner, Holec (1980) argued that it is important to take the responsibility of deciding learning objectives and keep self-evaluating oneself. Little (1996) argued that an autonomous learner "pre-supposes a positive attitude to the purpose, content, and process of learning on one hand and also well-established metacognitive skills on the other" (p.204). However, learner autonomy has never been easy to define; on different condition or specific context, learners have different degree of freedom in making their own choices (Little, 1990). In this study, using the most general concept, learner autonomy refers to "the ability to take charge of one's own learning" (Holec, 1981, p.3) and "the capacity to transfer what [he or she] has been learned to wider contexts" (Little, 1991).

Before the development of technology, studies of learner autonomy focused on the work of teaching learners how to perform self-directed learning and how to use self-access learning resources (Benson, 2013). With the popularity of technology and growing interests of technology learning, more and more studies start paying attention on the role of technology in learners' autonomous learning (Chik, 2014; Collentine, 2011; Lee; 2011; Mutlu, 2013; Smith, 2013). Benson (2013) pointed out that after the widespread application of technology in language learning, the focus of autonomous learning is different to what it was in 1970s. The direction of studying autonomous learning has been changed from studying how to develop learners' learner autonomy to examining learners' autonomous learning with the help of technology. The key factor related to this change is the utilization of Internet in language learning (Benson, 2001). As Benson (2013) mentioned, the Internet provides massive expansion of access to learning resources to learners.

Though many researches have studied technological application on autonomous learning, such as the Internet (Benson, 2013), the digital gaming (Chik, 2014), and blogging (2011, Lee), to what extent can language learning software promote learner autonomy has not yet been well-examined. This paper aims to investigate learners' autonomous learning with the assistance of language learning software. In this research, Duolingo, a free online language learning software, is selected as the target language learning software. Since Duolingo was voted as one of the popular app in 2013 of Apple's iPhone APP and Best of the Best of Google Play in 2013 and 2014 (Zipkin, 2015), choosing Duolingo as the target language learning software to investigate learner autonomy may be meaningful because many people around the world have used Duolingo. Ten college students, who regard Duolingo as an effective language learning software and are still learning with it, were selected as the participants in this quantitative research to investigate their autonomous learning. Besides examining to what extent learner autonomy can be promoted, this study also investigated learners' attitude toward learning with Duolingo to find out how Duolingo assists learners in their learning and what features learners love to learn with Duolingo.

Literature review

Learner Autonomy

Learner autonomy refers to a capacity of taking full responsibility of one's learning (Benson, 2011, p.58; Holec, 1981). According to Holec (1981), they perform learner autonomy by "determining objectives, content, and progression, selecting methods and techniques, monitoring acquisition, and evaluating what has been acquired" (p.3). That is, autonomous learners are active in their learning that they clearly "understand the purpose of their learning, explicitly accept responsibility for their learning, share in the setting of learning goals, take initiatives in planning and executing learning activities, and regularly review their learning and evaluate its effectiveness" (Little, 2003).

Aside from the aspect of self-managed behaviors of learning, Little (1991) also provides another perspective of learner autonomy—psychological autonomy. In Little's (1990), he argues that "the most efficient learners will be those who know how to bring their existing knowledge to bear on each new learning task" (p.82) and provides his definition of learner autonomy:

> Autonomy is a capacity—for detachment, critical reflection, decision-making, and independent action. It presupposes, but also entails, that the learner will develop a particular kind of psychological relation to the process and content of his learning. The capacity for autonomy will be displayed both in the way the learner learns and in the way he or she transfers what has been learned to wider contexts. (Little, 1991, p.4)

Though this concept of learner autonomy has been widely accepted over the year, many researchers regard autonomy as a non-easily defined behavior. Little (1990) acknowledge that autonomy is "not a single, easily describable behavior" (p.7). Benson (2013) states that autonomy is "complex, multidimensional, and variably manifested" (p.840). According to Benson, he indicates that autonomy can be manifested "in the form of autonomous language learning". That is, when learners are doing practices made by instructors, through group discussion or through peer-evaluation they take control to all aspect of learning. Moreover, autonomy can be manifested in the learning "outside the context of formal instruction." In this perspective, learner autonomy refers to the concept that learners become self-initiated; they start their learning from goal-setting, material-choosing, to self-evaluating.

The concept of learner autonomy seems to be flexible and can be slightly changed according to different learning context. However multifaceted it may be, Little (1990) provides five negatives principles of "what is leaner autonomy." He indicates that autonomy is "not a synonym to self-instruction; that is, it's not limited to learning without teachers", "not a matter of letting learners get on with things as best they can", "not another teaching method that teachers do to learners", "not a single, easily described behavior", or "not steady state done achieved by learners."

Learner Autonomy and Technology

With the wide-spread of technology and popularity of technology's usage in language teaching, accessible learning resources have become very different to what it was in

1970, which results in slightly different perspective of learner autonomy (Benson, 2013). Benson (2013) demonstrates that the development of Internet let the access to resources largely expand. Learners now don't necessarily rely on teachers' materials and instructions. However, learners can select the resources through the Internet, which provide bigger chances for them to initiate their own learning. Changes also happened to learner control. In early researches, learner autonomy refers to learners' "collection and provision of resources through self-accessing… and also their self-directed training" (Benson, 2013). Learner control still limited to the instructors and the instructional content. However, with the emergence of technology in language teaching, researchers now have chances to look for self-initiated learning, without the intervention from language teachers.

Besides knowing how learner autonomy changed with the intervention of technology in language teaching, Oxford (2003) suggests that researchers are also curious about under which "situational conditions" may develop learner autonomy, because these are regarded as "other-created condition, not conditions initially generated by the learner." Healey (2007) focuses on the condition of self-directed settings and promotes a table of four situational conditions in terms of the flexibility of content and locus of control (See Table 1). From fixed to variable content, and from teacher-controlled to learner-controlled, Healey categorizes into highly structured learning, accreditation and training, contract-based independent study, as well as highly self-directed learning.

Table 1. *Four Settings for Self-directed Learning*

		Locus of Control	
		Teacher ←	Learner
content	Fixed ↕	**A. Highly structured learning** ➢ Students control time and pace. ➢ Designer or teacher controls content, sequence, and evaluation.	**B. Accreditation and training** ➢ Students control time, pace, and sequence. ➢ Teacher, board or designer controls content and evaluation.
	Variable	**C. Contract-based independent study** ➢ Students and teacher negotiate all aspects.	**D. Highly self-directed learning** ➢ Students control all aspects.

Healey (2007) points out that most of the technological learning materials are belong to B category for they provide learners the opportunities to choose learning materials from the technological programs and decide how to learn with it by themselves.

Research Design

This study set to understand to what extent learner autonomy (LA) can be promoted by mapping the findings from an exploratory study on learners who have learnt with Duolingo in FLA learning context to Nguyen's (2012) framework for investigating learner autonomy. Following Chik's (2014) research design of exploring the gaming practices of those who had mentioned using digital games for L2 learning to understand their autonomous learning behaviors, this study applied the same method of exploring learners who have learned with Duolingo for a period of time to

investigate to what extent Duolingo learners practice autonomous learning. Selecting learners who have learned with Duolingo, but not finding participants to start learning from the beginning is because this study wants to maintain the meaningful characteristics of real-life events and to obtain the most realistic behaviors of their learning with Duolingo. If researchers choose to investigate Duolingo users who were asked by researchers to participate in the experiment, the study may loose the chance to investigate learners' self-initiated attitude, which is one of an important element of learner autonomy. This is the reason why this study chose to explore learners who have learned with Duolingo for a period of time.

In this study, participants were selected from the researcher's friends or her friends' of friends. There were two criteria for selection of the participants. The first criterion was that the participants should have learned with Duolingo for at least three weeks. Learning for three weeks without any discontinuation might imply that the users have some degree of learner autonomy and they are the target subjects of this study. They can regulate themselves to learn continuously for three weeks, which is a period of time that cannot be achieved because of the curiosity and interest to a new learning tool. The other criterion was that the participants were still learning with Duolingo. It was to ensure that all the participants provide the most realistic and familiar information to the researchers but not something recalled from their memory. Finally, there were 10 Duolingo users participating in this research. All of them were college students studying in National Taiwan Normal University and National Taiwan University of Science and Technology. That is, they were all between the age of 22 and 26 and from the similar cultural context. All of their native language is Mandarin Chinese. There was no restriction on the target second language learning. 4 of them were learning German. 3 of them were learning French. 2 of them were learning English. 1 of them was learning Spanish. The last person was learning Swedish. In addition, in this study, there was no restriction on their choosing interface of their learning with Duolingo. Duolingo was available both on the computer and on the smartphone. However, participants could choose whichever devices they were more convenient to learn with and change between the interface whenever they wanted to. The learning interface was not a restricting criterion of the participants.

Table 2. *Background Information for the 10 Participants*

Learner	Age	Target Language	Already Learned for	Learning Interface
Participant 1	23	French	3 weeks	Computer
Participant 2	22	German	12 weeks	Smartphone
Participant 3	26	German	48 weeks	Smartphone
Participant 4	23	French	3 weeks	Smartphone
Participant 5	24	English	4 weeks	Computer
Participant 6	22	Spanish	4 weeks	Smartphone
Participant 7	26	Swedish	48 weeks	Smartphone
Participant 8	23	German	3 weeks	Smartphone
Participant 9	22	German	48 weeks	Computer
Participant 10	23	English	12 weeks	Computer

Nguyen (2012) argued that an autonomous study may easily fall into a description of learners' autonomous behaviors when the evidence was not strong and convincing to show the strength between learner autonomy and language learning outcomes.

Previous researches had shown that learners became more autonomous in their studies (Cunningham & Carlton, 2003; Dam, 1995; Natri, 2007; Tagaki, 2003), but there was no empirical evidence to show the benefits of learner autonomy. For example, the lack of compatibility between groups of participants may be a big issue in the studies of learner autonomy (Nguyen, 2012). However, if learner autonomy is measured rigorously and properly, the study can provide persuasive evidence for the benefit of learner autonomy for language learning. In order to measure learner autonomy rigorously, this study followed the three principles provided by Nguyen (2012). First, the notion of learner autonomy should be clearly defined "based on which any accounts of learner autonomy can be analyzed and measured". Second, the study should employ both qualitative and quantitative methods for its data collection to investigate learner autonomy from a variety of points of view for both methods can provide "equally valuable, but different, data". Third, the tool should be "carefully developed, piloted and validated" (p.51).

Little (1990) and Benson (2013) acknowledged that learner autonomy is not easily to be defined depending on different learning contexts. This study is based on the CALL context, where learners have the opportunities to choose learning materials from a number of online learning software and control the pace, time, and sequence of their learning (Healey, 2007). However, they have no right to choose the learning content, which is designed by the software programmers. Combining Benson's (2001) and Holec's (1981) definition of learner autonomy and Healey's (2007) software learning context, learners may perform these autonomous behaviors: reflecting upon their learning, initiating changes of learning strategies in target language, being able to create situation of learning for themselves, monitoring their own performance and self-accessing other materials to improve themselves. In this study, these autonomous behaviors are the target items that are going to be investigated to show the extent of learners' practice of learner autonomy.

This study was conducted in two phases. The first phase was applied with quantitative method that asked participants to fill in a questionnaire with 7-point liker scale. Q1-Q2 were questions about their educational background of the target language. Q3-Q5 were self-initiation questions about learners' motivation, reasons to start language learning and their learning goal setting. Q6-Q19 were self-regulation questions asking participants to evaluate themselves and fill in the 7-point liker-scale about their self-regulated behavior during their learning. Those participants who had low points in self-initiation part and high points in self-regulation part were selected to participate in the second phase, which was conducted by an in-depth interview. Comparing the difference between self-initiation part and self-regulation part, the result showed that these participants started with low motivation to learn. This may reduce the possibility of selecting those who had already built up learner autonomy before starting to learn with Duolingo. For those who started with low motivation and still perform low degree of self-regulation during the learning, they were also deleted from the second phase. In the end, 5 out of 10 were selected to participate in the second phase to have an in-depth interview about their learning attitude and their improved language skills from learning with Duolingo.

Findings

Self-regulation: Learning Language on a Regular Basis

According to the result from the questionnaire, participants presented the highest score in Q13: *During your learning with Duolingo, to what extent do you regulate yourself to learn on a regular basis?* (M = 6.22, S.D.= 1.09) It shows that every participant regulated themselves to maintain the habit of learning with Duolingo. In addition, the average number of the days all the participants logged in Duolingo to learn was 5.18, which meant that these participants had already performed high degree of self-regulation, because they asked themselves to learn language with Duolingo more than five days a week. It must be a great news to hear that learners could regulate themselves to learn the target language five days in a week. However, it was mainly attributed to Duolingo's daily reminder function. It was a function reminding you that you haven't learned with Duolingo today by sending email. Many participants mentioned in the interview that they loved this function of Duolingo, because it made them have chance to learn the target languages every day. By receiving the reminding emails everyday, some participants mentioned that logging-in Duolingo to learn language had gradually become a habit. Some were used to learn language on their way home in the traffic. Some were used to learn language for thirty minutes before they went to bed. Duolingo made learners get into a good habit to learn the target language every day. Moreover, there was another function that encourage learners to learn with Duolingo every day, which was Duolingo's reward systems. According to one participant, she mentioned that Duolingo would give you more lingots, Duolingo's shopping money, if one had regularly logged-in and learned the language. This participant was a lover of lingots. She encouraged herself to learn with Duolingo by winning as more lingots as she could. She enjoyed shopping in Lingot store to purchase items that can help her complete a lesson, such as "heart refill" or "streak freeze" or items that can add new skills to language tree, such as "idioms", "flirting" or "timed practice".

Self-regulation: evaluating and finding solution to the problems

For Q13: *During the learning with Duolingo, how often do you evaluate yourself and find solution to the problems you have*, all the participants presented mid-high score. (M = 5.44, S.D. = 0.72), which means that most of the time, the participants would find the answers by themselves. The role of teachers was replaced by other learning materials. Duolingo played a good role in answering learners' questions. During the interview, many participants mentioned that most of the time they could find the answers from Duolingo's feedback after every activity. Because Duolingo's learning tasks were mainly designed to let learners translate, when learners couldn't finish the task, they would understand what their problems and questions were. Then, after they sent out the answer, Duolingo's feedback could tell them where they were wrong and what the right answer was. Moreover, in the computer interface, Duolingo provides every question with a discussion forum for learners around the world to ask questions. Participants 5 mentioned that he loved this function. Whenever he was still not clear about the answer after reading Duolingo's feedback, he would visit the forum and looked for the answer. Most of the time, he could find learners who had the same questions as him. Besides looking for the answers, P9 also mentioned that checking the discussion forum allowed her to learn from others' questions. Duolingo was

designed for learners to learn by themselves without instructors' assistance. It's discussion forum and the feedback after every questions were very popular among the participants. Many of them even pointed out that they loved to learn with Duolingo, because they loved the interaction between learners and "instructor"—Duolingo. The participants seemed to build up a good habit to find the answers by themselves, but not rely on teachers' answers. In addition, for Q16: *After learning with Duolingo for a period of time, how willing are you to look for more materials for improving language ability*, the average result for this question is M = 5.8, S.D. = 1.09, almost gets 6. That is, the participants build up the motivation and willing to find more materials to improve their language ability.

Promoting Learner Autonomy

Five out of ten participants were selected to participate in the second phase. These five participants were those who had performed low degree of learner autonomy at the beginning, but showed high extent of autonomous learning after a period of time of their learning with Duolingo. Table 3. provided the comparing result of participants' self-initiation scores and self-regulation scores. As you can see in Table 3., the result showed that participants among the second group, the group in the middle, presented great extent of autonomous learning behaviors after a period of time learning with Duolingo. All of these participants performed high scores in Q8: *During your learning with Duolingo, how often do you evaluate your own learning* (M = 5.2, S.D. = 0.836). It implied that all the participants evaluate their learning very often during their learning. According to participant 4, Duolingo's activities were designed to let users finish the tasks independently, such as translation, indication, matching and fill-in-the-blank. That is, users could only rely on themselves to finish the tasks. If they couldn't finish the tasks, they would immediately understand their problems of this lesson, for example, forgetting the spelling of the vocabulary or forgetting the meaning of the new vocabulary.

Table 3. *Comparison between the Self-initiation Scores and Self-regulation Scores*

	Self-initiation Part (Q3-Q5)		Self-regulation Part (Q6-Q16)	
Participants	Total/21	Percentage(%)	Total/77	Percentage(%)
Already with Strong Learning Motivation				
3	18/21	85.71%	63/77	81.81%
7	18/21	85.71%	62/77	80.51%
6	16/21	76.19%	61/77	79.22%
10	16/21	76.19%	56/77	72.72%
Target Participants from low learning motivation to high degree of learner autonomy				
1	10/21	47.61%	68/77	88.31%
2	10/21	47.61%	60/77	77.92%
4	8/21	38.09%	55/77	71.42%
8	11/21	52.38%	53/77	68.83%
9	5/21	23.80%	56/77	72.72%
Participant without building up strong LA during the learning				
5	8/21	38.09%	43/77	55.84%

Another interesting finding was that P1 performed much greater extent of learner autonomy than those participants in the same category. As you can see in Table 2. However, participant 1 had only learned with Duolingo for 3 weeks, and she even performed greater extent of autonomous behaviors than P3 and P7, who had already built up strong motivation in language learning, such as Q9: *reflecting upon her learning and think of better ways to make learning more effective* and Q10: *tending to adjust her learning strategies to make learning more effective*. The same phenomenon was also found in P4's autonomous learning that he performed higher score in Q9 and Q10. The reason might be that because among these five participants, only P1 and P4 were in intermediate level of their target languages. Others were still in elementary level, which indicated that they still hadn't had enough exposure to the target language and not to mention they would come up with any idea to adjust their learning strategies to make learning more effective. This finding further indicated that for those who have already had some educational background knowledge about the target language, Duolingo might have positive effect to the language learning outcome. Many participants also pointed out this phenomenon that Duolingo is much suitable for those who have already had some educational background knowledge to the target language.

Participant 2 was also a learner who performed greater extent of learner autonomy after a period of time learning with Duolingo. However, different autonomous learning behaviors had been found during the interview with her. P2 was not an active learner. She chose Duolingo as her language learning software because Duolingo provided a planned lesson for her. In addition, Duolingo would remind her to review some lessons by decreasing the yellow power chart under every lesson when she hasn't reviewed it since last time she finished the lesson. For P2, she only needs to regulate herself to learn with Duolingo every day, then she can improve her language ability. P2 mentioned that this function of reminding learners to review over and over again was a very good method to maintain the familiarity with the language and to build up concrete basic knowledge of the target language. From P2's autonomous liker-scale, she presented low score on *planning, coming up with better learning strategies and adjusting her learning strategies*. However, she showed very high score on *self-accessing time to learn, finding the solution to the problems, and realizing her shortage and where she should improve more*.

Improvement: new vocabulary, vocabulary spelling, and recalling learned vocabulary

From the interview with the five participants from the second group, four of them had mentioned their vocabulary database had been widely expanded by leaning with Duolingo. Some explained that they learned many new vocabularies step by step, from easy to difficult, and from nouns to verbs and adjectives. Others said that they had improved their spelling. They were able to spell the word as long as they heard the pronunciation. And still others mentioned that they had recalled many vocabularies that they learned before. Most of the participants appraised Duolingo's activity design for teaching vocabulary. Participants even argued that Duolingo is mainly designed for learning vocabulary. There were different variety of activities designed for learning vocabulary, including picture-vocabulary matching, dictation and translation. These activities usually accompanied with repeating pronunciation of the vocabulary and the translation in Chinese. By learning with Duolingo, many

participants pointed out that they were more familiar with how to pronounce the words in the target languages.

Another advantage of Duolingo's activity design is that the same vocabularies repeatedly appear in different lessons. Moreover, Duolingo will ask learners to repeatedly review the vocabularies after a period of time since last time you have learned them. In the interview, participants mentioned this function allowed them to remember the new vocabularies in a short time. Because the vocabularies kept appearing in the activities, if they wanted to finish the lessons, they must to force themselves to remember the new vocabularies. By this way, learners not only learn many new vocabularies, but also review the vocabularies that they learned before.

Conclusion

By learning with Duolingo, learners tend to increase learner autonomy, in terms of their *self-regulation on learning on a regular basis, self regulation on accessing time to learn, evaluating one's learning, finding more materials to learn,* and *adjusting learning strategies to have more effective learning.* In this study, five out of ten participants performed greater extent of autonomous behaviors in their learning. However, only those with some educational background knowledge to the target language could gain the advantage between learner autonomy and language learning outcome. Participants who had some knowledge about the target language realized where their problems were and understood how to utilize Duolingo's feedback and discussion forum to solve their problems. During the learning process, learners well demonstrate learner autonomy to give rise to better language learning outcome. These participants even regard Duolingo as the best language learning software for review. They could review what they had learned, and also acquired new knowledge. Because Duolingo allowed learners to learn step by step, and from easy to difficult level, all the participants in this study mentioned that they never feel stressful when learning with Duolingo.

Duolingo's instant feedback and daily reminder are the two most popular functions among the participants. Many participants enjoyed the interaction with Duolingo during their learning. They pointed out that this interaction makes learning become interesting and effective. The instant feedback provided by Duolingo not only allow leaners to understand their mistake and problems immediately, but also come up with the answer for learners to solve the problem. Sometimes, when learners answer correctly for all the questions, learners may easily get the sense of achievement from a series of correct feedback, a soft bell sound and green color. As for the other popular function—daily reminder, it built up the habit of learning language every day for many participants. It was also a great contributor to fostering learner autonomy. Duolingo's daily reminder forces learners to learn to make use of their time and regulate themselves to learn every day. By sending a reminding email everyday, Duolingo played a good role in learners' language learning to make them maintain the familiarity with the target language.

Though present study shows that Duolingo promotes learners' learner autonomy, limitation still exists. The participants in this study are all university students. There may be the possibility that these university students have already build up learner autonomy in language learning. As Benson (2001) argued that learners may acquire

leaner autonomy as they become more mature. In this study, the variable of teacher instruction had already been considered and deleted. That is, for these 10 participants, they haven't joined any other language classes during their learning with Duolingo. However, the variable that whether participants have acquired autonomy or not is difficult to control, which may be an important consideration for future research design.

Reference

Benson, P. (1996). Concepts of autonomy in language learning. *R. Pemberton, E. Li, W. Or, & H. Pierson. Taking control. Autonomy in language learning*, 27-34.

Benson, P. (2001). *Teaching and researching: Autonomy in language learning*. Routledge.

Benson, P. (2013). Learner autonomy. *TESOL quarterly,* 4(47), 839-843

Benson, P. (2013). *Teaching and researching: Autonomy in language learning*. Routledge.

Betil, E. T. (2013). The role of computer-assisted language learning (CALL) in promoting learner autonomy.

Chik, A. (2014). Digital gaming and language learning: autonomy and community. *Language, Learning & Technology*, *18*(2), 85.

Collentine, K. (2011). Learner autonomy in a task-based 3D world and production. *Language Learning & Technology*, *15*(3), 50-67.

Dam, L. (1995). Learner Autonomy 3. *Dublin: Authentic*.

Duolingo, the Chart-Topping Language App, Unveils a Platform for Teachers. (2015, January). *Entrepreneur*. Retrieved from: http://www.entrepreneur.com/article/241634

Holec, H. (1979). *Autonomy and Foreign Language Learning*.

Holec, H. (1980). Learner training: meeting needs in self-directed learning. In *Foreign language learning: meeting individual needs. Oxford: Pergamon* (pp. 30-45).

Lee, L. (2011). Blogging: Promoting learner autonomy and intercultural competence through study abroad. *Language Learning & Technology*, *15*(3), 87-109.

Little, D. (1990). *Autonomy in language learning* (Vol. 1990, pp. 29-34). London.

Little, D. (1996). Freedom to learn and compulsion to interact: promoting learner autonomy through the use of information systems and information technologies. *Taking control: Autonomy in language learning*, 203-218.

Little, D. (2003). Learner autonomy and second/foreign language learning. *Subject Center for Languages, Linguistics and Area Studies, Guide to good practice. Retrieved September*, *8*, 2007.

Jarvis, H. (2012). Computers and learner autonomy: trends and issues. *British Council ELT*, 387-402.

Oxford, R. L. (2003). Toward a more systematic model of L2 learner autonomy. In Palfreyman, D., Smith, R. C. (Eds.), *Learner autonomy across cultures: Language*

education perspectives, (pp. 75-91). Basingstoke, NY: Palgrave Macmillan

Smith, K., & Craig, H. (2013). Enhancing the Autonomous Use of CALL: A New Curriculum Model in EFL. *CALICO Journal*, *30*(2), 252-278.

Appendix I: Questionnaire (English Translation)

Dear participants, On the matters of privacy, your answers will only be used in this study. Real name won't be shown in the paper. Thanks for your participation and cooperation. Researcher: Charlene Tsai (MA student from National Taiwan Normal University TESOL program)

	Background information	Explain						
1	Do you learn the target language in other places (school, learning institute, etc..) If yes, please explain.							
2	Have you ever learned the language before you start learning with Duolingo? If yes, please explain to what level.							
3	What's the reason that makes you start learning with Duolingo?							
4	How do you find Duolingo as your language learning tool?							
5	Before starting to learn with Duolingo, did you set your learning goal?							
	For the following questions, please based on your learning process with Duolingo	never--------------------------always						
6	You find and make use of time to learn with Duolingo.	1	2	3	4	5	6	7
7	You develop your language learning plan	1	2	3	4	5	6	7
8	You monitor and reflect on your learning.	1	2	3	4	5	6	7
9	You will think of better ways to make learning more effective.	1	2	3	4	5	6	7
10	You adjust your learning strategies to make learning more effective.	1	2	3	4	5	6	7
11	You realize which learning activities are effective and which are not.	1	2	3	4	5	6	7
12	You regulate yourself to learn on regular basis.	1	2	3	4	5	6	7
13	You find solutions to your problems when you have questions or make a mistake.	1	2	3	4	5	6	7
14	After a period of learning, you evaluate yourself and your learning outcome.	1	2	3	4	5	6	7
15	After a period of learning, you realize your shortage and understand it should be improved.	1	2	3	4	5	6	7
16	After a period of learning, you will find more materials for further reading.	1	2	3	4	5	6	7

Appendix II: Interview Question

1. 一般來說，你都什麼時候使用 Duolingo？請說明"時間"及"地點"。 (Usually, when do you usually learn with Duolingo? Please, explain "time" and "places")
2. 一般來說，你每次使用 Duolingo 都使用多久時間？ (Usually, how long do you learn with Duolingo for every time?)
3. 一般來說，你每週使用 Duolingo 的頻率為何？ (Usually, how many times do you learn with Duolingo in a week?)
4. 在使用 Duolingo 學習以前，你有設定學習目標嗎？若有，請說明預計多久時間，學習到什麼程度。 (Before starting to learn with Duolingo, do you set any learning goal? If yes, please explain to what extent and in how long do you wish to achieve.)
5. 你喜歡使用 Duolingo 學習語言嗎？請舉體說明哪些地方/功能吸引你。 (Do you like to learn with Duolingo? Please explain how and what in detail.
6. 在使用 Duolingo 學習一陣子後，你覺得語言能力進步最多的是？請具體說明。 (After learning for a period, which language ability do you improve most? Please explain as detail as you can.)
7. Duolingo 如何使你該項語言能力進步最多？請具體說明。 (How does Duolingo make you improve that language ability? Please explain as detail as you can.)
8. 你覺得在使用 Duolingo 過程中，有沒有遇到學習上的困難？若有，請具體說明。 (During your learning with Duolingo, do you face any difficulties in your learning? If yes, please explain as detail as you can.)
9. 當你遇到困難/問題時，你覺得 Duolingo 的註解對你學習有幫助嗎？若有，請具體說明。 (When you face the difficulties, do you think Dulingo can help you by their explanation? If can, please explain as detail as you can.)
10. 你覺得 Duolingo 有提升你語言學習的自我規劃/學習能力嗎？若有，你覺得是哪方面的能力。 (Do you think Duolingo can help you improve your planning/programming ability of language learning? If yes, please explain what kinds of abilities.)
11. 什麼原因讓你一直使用 Duolingo 學習語言？請具體說明。 (What's the reason that makes you keep learning with Duolingo? Please explain as detail as you can.)

Appendix IIII: Data Analysis

Self-initiated Questions Analysis											
	Questions	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
Q3	**What's the reason that makes you start learning with Duolingo?** (*1. Curious about the game; have fun and willing to try. 2.Choosing to learn language to kill time. 3. To improve language ability, but no specific goal. 4. Make use of one's time to learn language. 5. To review and maintain the familiarity with the language 6. With learning goal. 7. Learning for language test or studying aboard.*)	5	3	7	2	1	6	6	5	1	6
Q4	**How do you find Duolingo as your language learning tool?** (*1. Asked by teacher. 2. Recommended by teachers. 3. Heard from friends that it's interesting. 4. Recommended by friends. 5. Asking friends by yourself. 6. Asking friends because strongly eager to find a language learning tool. 7. Looking for the tool by yourself.*)	4	3	4	5	4	5	6	4	3	4
Q5	**Before starting to learn with Duolingo, did you set your learning goal?** (*1. Without goal. 2. Learning as much as I can. 3. With goal, but didn't strictly follow. 4. Following Duolingo's daily goal. 5. Practicing for school work. 6. Being able to use language in daily communication. 7. Pass language test.*)	1	4	7	1	4	5	6	2	1	6
TOTAL (21)		10	10	18	8	8	16	18	11	5	16
Percentage (%)		47.6	47.6	85.7	38.0	38.0	76.1	85.7	52.3	23.8	76.1
Self-regulated Questions Analysis (7-point liker scale: 1. Never -- 7. Always)											
	Questions: Based on your learning process with Duolingo	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
Q6	You find and make use of time to learn with Duolingo.	7	7	5	4	6	7	3	5	7	4
Q7	You develop your language learning plan	5	3	6	2	2	5	5	4	5	4
Q8	You monitor and reflect on your learning.	6	5	5	5	3	4	5	4	6	5
Q9	You will think of better ways to make learning more effective.	6	3	4	6	4	3	6	4	3	6

Q10	You adjust your learning strategies to make learning more effective.	6	3	5	6	3	6	6	4	3	6
Q11	You realize which learning activities are effective and which are not.	6	6	6	7	5	4	7	6	4	4
Q12	You regulate yourself to learn on regular basis.	7	7	7	4	5	7	6	6	7	4
Q13	You find solutions to your problems when you have questions or make a mistake.	6	7	6	5	5	5	5	5	5	6
Q14	After a period of learning, you evaluate yourself and your learning outcome	6	7	5	5	4	6	6	4	6	4
Q15	After a period of learning, you realize your shortage and understand it should be improved.	6	7	6	4	3	7	6	6	5	6
Q16	After a period of learning, you will find more materials for further reading.	7	5	7	7	3	7	7	5	5	7
TOTAL (77)		68	60	63	55	43	61	62	53	56	56
Percentage (%)		88.3	77.9	81.8	71.4	55.8	79.2	80.5	68.8	72.7	72.7