A Review of Research into Google Apps in the Process of English Language Learning and Teaching

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Abstract
GALL (Google Assisted Language Learning) refers to Google as a collaborative and communicative tool that supports online and blended language learning. This research paper presents an overview of previous studies on using Google Apps in the process of learning and teaching of English language. A systematic search on ERIC digital library and Google Scholar reviewed the previous studies published during the last ten years. There were one hundred seventy-eight articles, and thirty-four studies were sorted and analyzed using NVivo software. This systematic review showed that using some Google Applications, resulted in developing English language learning and teaching. The writing was the most language skill investigated. Translation practices have changed due to using machine translation with the help of Google Translate web site. Besides, more studies with concern for reading skills, speaking skills, oral reading, and the Google speech recognition system emerged as a promising field for further research.

Keywords: Blended learning, English Language learning and teaching, Google Apps, Online learning

Introduction

Background

Nowadays, learners expose to information technology that shapes their learning styles and methods of learning. Net Generation students consider that using technology in the learning environment is essential. Most of them have experience of using online tools in their education (Roberts, 2005). They learn best through interaction, and they need a particular use for technology to communicate quickly with each other. Moreover, they learn by creating, editing, commenting, and sharing documents and ideas. (McNeely, 2015). All these requirements are available through web 2.0 applications and tools.

Web 2.0 means the second generation of the internet, which gives users access to add, modify, comment, and share content and information. Several web 2.0 applications developed for open use. Examples include Wikis, DropBox, Blogs, Evernote, SkyDrive and Google Apps, etc. These web-based Apps for learning are productive and collaborative. Besides, all these applications are exciting and easy to use for both learners and their instructors. Previous studies concluded that most students have positive attitudes towards the learning that utilizes web applications (Lin & Jou, 2013). Google offers some types of these web Apps for education and communication (Downes, 2007; Miller, 2011).

Chinnery (2008) introduced the acronym GALL (Google-assisted language learning). He emphasized that Google has pedagogical uses since its tools are communicative, informative, productive, and collaborative. Examples of Google tools and Apps are Google Docs, Google Calendar, Google Groups, Google +, Google Earth, and YouTube. Researchers concluded that Google offers many tools that give learners opportunities to collaborate from anywhere and at any time (Covili, 2012). Sun (2003) affirmed that learners preferred using Google apps in their learning than traditional methods. Kovalik et al. (2014) found out that students had a positive attitude towards lessons that used free web 2.0 tools such as Google tools and bloggers. Thus, there are remarkable researches that investigated the effect of using Google Apps in the processes of English language learning. So, it is necessary to review some of these researches in this domain of investigation.

Literature Review & Key Concepts

Google Apps

In 1998, Google was a new search engine, and then its features continued to improve until it became the most-visited world web site. Later on, new Google tools and Apps developed. It included Google Apps for business, Google for Work, and Google Apps for Education. The latter comprised promising Apps for learning and teaching (Chinnery, 2008). Among Google Apps for education, Google Docs is a free web-based office set that anyone anywhere can used it. Google Docs tools are Documents, Presentations, Spreadsheets, Drawings, and Forms. They are secure web applications that save data automatically with minimal chances of losing them (Taprial & Kanwar, 2011). Furthermore, they offer free templates that enable users to complete complex and powerful tasks (Strasma, 2010).

Google Documents offer collaborative web-based word processing for formatting texts and paragraphs. With Google Documents, learners can work together in the same document at the same time (Conner, 2008; Oishi, 2007). It allows learners access, creates, writes, collaborates, and edits their documents from their computers, tablets, or smartphones. Therefore, it is an easy way for communication (Zhou, Simpson & Domizi, 2012). Moreover, learners can add links, insert images and drawings, and then share their Google Document or save it as a Microsoft Word or a pdf file. Google Docs represent valuable online collaborative group work tools that have a positive effect on students' sense of a learning community (Abdelmalak, 2015). Another application of Google is the spreadsheets, which is similar to Microsoft Excel sheets. It can be used for doing mathematical or statistical functions. With Google Forms, learners can gather and organize information easily. Learners have different options to design their forms, surveys, and quizzes. Once learners have responded to Google form, their responses appear as a summary or in a separate spreadsheet to show details. Google forms and spreadsheets are always current and saved on the web (Conner, 2008; Siegle, 2007).

Google slides have the features of Microsoft PowerPoint, which allow learners to introduce their topics and subjects through a variety of presentations, themes, different fonts, embedded videos, and animations. As with other applications, learners can view, share, and collaborate with others on the same presentation online (Taprial & Kanwar, 2011). To add more features to Google Docs, learners can install add-ons. They can click the Add-ons menu to browse the store to install the tools they want. Wen (2014) figured out nine useful add-ons for Google Docs. Examples are clipboard, translate Easy Bib, and Track Changes.

Google Apps include other applications used in the learning and teaching processes. They provide a medium for sharing teacher-created lessons and activities. Among these applications are Google Drive, Gmail, and Google calendar. Gmail is the Google most secure free web-mail where learners can compose, send, and receive emails. Also, they can attach files and insert links from their Google drive. Furthermore, teachers can create a list of contacts of their students and assign them to groups. (Conner, 2008). Google Drive is an online storage device where learners and teachers can create folders to upload files and documents for a view, comment, or edit with others. Besides, it saves all Google Docs created by them. Furthermore, all access to Google Docs and applications take place through Google Drive (Lamont, 2015).

Google Calendar is a reliable online application that can be accessed anytime to record significant events. It has a reminder option that sends a notification to users' emails or smartphones (Darbyshire & Darbyshire, 2010). Inside classrooms, Google Calendar is as a method of reminding students of important dates such as exam or quiz times and deadlines for assignments.

Google Classroom is a free and promising educational suite that supports both online and blended learning. Teachers can easily create classes and invite students using their Gmail accounts or class code. Then teachers can add assignments, tests, questions, and a class Drive folder to receive students' files. Teachers also can communicate with their classes by using the Stream icon where they can share posts and create and schedule announcements. Heggart and Yoo (2018) concluded that Google classroom improved students' participation and learning.

Thus, Google has positive educational and social consequences (Vise & Malseed, 2005). It provides web Apps that bring classrooms and educational institutions into the 21st century (Lawrence & Lawrence, 2007). With little training, Google tools run most activities inside and outside classes. Thus, they are suitable for project-based and online or blended learning (Leh, 2014). The study by Abdelmalak (2015) concluded that Google Docs developed students' sense of learning community. To sum up, Google is changing the way students interact and learn.

Google Apps and language learning and teaching

Previous studies investigated the effectiveness of using Google apps in teaching and learning of foreign languages such as Gunn, 2005; Geiller, 2014; Leh, 2014; Lin & Yang, 2013; Starsma, 2010). They have indicated the effectiveness of these Apps in improving learners' English language skills.

Therefore, a systematic review is needed to get a proper insight into the significance of Google Apps. Moreover, the study sheds light on the gaps that need more empirical researches.

Research objectives
The objectives of this systematic review are:

1. to present previous studies that have employed Google Apps in the process of English language learning and teaching,
2. to identify the language skills included in these studies,
3. to explain the objectives and the results of these studies,
4. to classify the participants and tools of these studies, and
5. to find out gaps in current researches that may lead to further investigations.

Research questions
1. What are the published articles on Google Apps and the English language between 2009 and 2018?
2. What are the language skills explored?
3. What are the participants and tools of these studies?
4. What are the objectives and results of these studies?
5. What are the language areas that need more investigation?

Methodology
Inclusion criteria
The initial aim of this research was to review all possible previous research studies focused on using Google Apps in the learning and teaching of foreign languages during the last ten years. A systematic online search on Eric Online Digital database and Google Scholar conducted to collect data for the present study. For the last ten years, there were one hundred seventy-eight articles. The majority of them (129) were from journal articles, (15) dissertation and theses, (86) reports, (4) books, (32) detailed reports, (18) evaluative reports, (13) information analyses, and (2) proceedings. These analyzed studies were to meet two criteria: the published researches on Google Apps and English language learning and teaching, and the language skills involved.

This analysis excluded irrelevant studies. Finally, there were thirty-four studies selected for this review. They were further managed and analyzed by NVivo software. They were from the following journals: "Computer Assisted Language Learning, CALL-EJ, Language Learning & Technology, English Language Teaching, International Association for Development of the Information Society, Advances in Language and Literary Studies, Educational Technology & Society, JALT CALL Journal, The EUROCALL Review, Turkish Online Journal of Distance Education, Turkish Online Journal of Educational Technology, International Journal of Teaching and Learning in Higher Education, TechTrends: Linking Research and Practice to Improve Learning, and International Journal of English Linguistics, Electronic Journal of e-Learning, Indian Journal of Science and Technology, and Teachers College Record."

As shown in Table 1, they covered five areas: learning and teaching of English language, writing, reading, speaking, and translation. For conducting a systematic review, the author grouped, compared, and contrasted all these studies according to a coding scheme that includes authors, date of publication, research objectives, participants, and results. These groups formed the Node classification in Nvivo software. Each study coded into its relevant node. Table1 presents the classifications of these studies..

Table 1. *In-depth review studies by research field*

Research field	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total	Percentage
• English language teaching & learning	1	-	-	1	1	-	2	2	-		23%	
• Teaching writing	-	1	2	-	2	-	4	4	-		11	35%
• Reading skills	-	-	-	2	-	-	-	-	-		2	6%
• Speaking skills	-	-	-	-	-	-	-	3	1		4	13%
• Translation studies	1		1		1	4	-	-			7	23%

Results and Discussion

Researches on Google Apps and learning and teaching of English language

In this section, eight analyzed previous studies dealt with Google Apps and English language learning. Six of them examined the effect of Google Docs on EL learning and their related motivation (e.g., Al-Tawil, 2016; Liu & Lan, 2016; Lin & Jou, 2013; Starsma, 2010). Studies by Alakurt and Bardakci (2017) and Alnujaidi (2017) pinpointed that learners had positive attitudes and acceptance towards Google Apps. The study by Dourda, Bratitsis, Griva, and Papadopoulou (2014) concluded that using Google Earth in a game-based learning class improved students' vocabulary acquisition, reading skills, and language learning. The participants in these

studies are from high school, university levels, and staff members. For details, see Appendix A, Table 2

As shown in Table 2, using Google Apps and Docs improved students' English language learning and increased their motivation. Students had positive perceptions of using Google Docs and Google + inside their classes (Alakurt & Bardakci, 2017). The tools used included a motivation questionnaire (Lin & Jou, 2013; Liu & Lan, 2016), reading and writing tests (Dourda et al., 2014), and attitude or perception questionnaires (Alakurt & Bardakci, 2017; Alnujaidi, 2017; Kelsen, 2009). Further researches may investigate the effect of Google Docs on children and primary school students' English language learning. More studies may explore teachers' suggestions for improving the utilization of Google Docs.

Studies that utilized Google Apps in the learning and teaching of writing
This section examines thirteen studies on Google and writing skills, published between 2012 and 2018. The source of data collected was questionnaires, such as studies of Zhou, Simpson, and Domizi (2012), Seyyedrezaie, Ghonsooly, Shahriari, Fatemi (2016), Suwantarathip, and Wichadee (2014), Han and Shin (2017) and Alsubaie and Ashuraidah (2017). Other studies used tests (e.g., Alsubaie & Ashuraidah, 2017; Geiller, 2014; Han & Shin, 2017; Seyyedeh & Seyyedrezaie, 2017; Seyyedrezaie et al., 2016; Suwantarathip & Wichadee, 2014). Two studies conducted interviews (Alsubaie & Ashuraidah, 2017; Ebadi, & Rahimi, 2017). The study by Kessler, Bikowsk, and Boggs (2012) used students' reports and classroom observations.

As shown in Appendix B, Table 3, most previous studies on writing were for college students, for instance, Alsubaie & Ashuraidah (2017), Ebadi and Rahimi (2017), and Kessler, Bikowski, and Boggs (2012). Further studies can investigate other levels, such as primary, preparatory, and secondary students. Almost all of the previous studies focused on the process of collaborative writing. The results affirmed the effectiveness of Google Docs and the Google search engines in improving students writing performance. Students showed positive attitudes towards integrating Google Docs in the process of writing (Seyyedrezaie et al., 2016). The Google search engines also helped learners to identify and correct their writing errors (Acar, Geluso & Shiki, 2011; Geiller, 2014; Yoon, 2016).

Studies on reading comprehension and Google intervention
Two studies, represented in Appendix C, Table 4. focused on reading comprehension and the use of Google Docs and Apps. The participants were college students in Park's study (2013) and undergraduate learners in Karnal and Vera's research (2013). The tool was a reading instrument to check learners' comprehension and use of reading strategies. More experimental studies can examine the effect of Google Docs and Apps on improving students' reading comprehension, oral reading, and engagement in reading tasks.

Studies on speaking skills and using Google Apps
The review found only four studies about speaking skills and the use of the Google speech recognition system, and one study employed Google earth. Appendix D, Table 5 represents the details.

As shown in Table 5, the participants in those studies were from higher education. A grammatical performance test was the tool of Ashwell and Elam's study (2017). Daniels and Iwago (2017) used a speaking test in their research. The results of these studies showed that the Google speech recognition system was a valuable tool in English language learning researches. More studies may investigate the effect of GSR on developing speaking skills and oral reading.

Studies on translation

Appendix E, Table 6, represents reviewed seven studies on translation and Google machine translation. Results show that some previous studies investigated the quality of Google machine translation, such as Azer and Aghayi (2015), and a few others examined its effect on translation performance El-Banna and Naeem (2016). The participants were beginners in Garcia and Pena (2011), but they were college learners, as in El-Banna and Naeem (2016). The qualitative study by Kadhim et al. (2013) employed a questionnaire to evaluate the output of machine translation.

Conclusions and recommendations

This paper reviewed some studies that used Google Apps in English language learning and teaching. The finding of the reviewed studies illustrated the importance of Google Apps in the process of English language teaching and learning. These Apps can be used as online learning tools and are applied quickly to support blended learning practices. Researchers showed that using Google Docs, Google Machine Translation, Google speech recognition systems, and Google Earth had significant effects on improving the English language among learners. The language areas of investigation were writing, reading, speaking, and translation with a focus on vocabulary acquisition, pronunciation, the accuracy of speech, lexical knowledge, error correction, collaborative writing, engagement in reading classes, using reading strategies, and quality and accuracy of the translation.

The tools used for data collection included surveys, questionnaires, tests, students' reports, and classroom observations. The participants in most studies were college students, followed by high school students and staff members. Few studies dealt with primary school students. Pedagogical activities included cooperative, situated, communicative, task-based, game-based, and learner-based learning. As for the affective aspects, positive results were for students' motivation, attitudes, self-esteem, encouragement and enjoyment, and reducing anxiety. Reviewed studies indicated that the advantages of Google Apps such as ease and usefulness of use and affordance and cost encouraged practice among learners.

This review may be an introductory guide to researches in the field of e-learning applications such as web 2.0 tools, including Google Apps in the English language learning and teaching processes. It may enable researchers to explore new domains for further investigation. The potential areas of research include the Google speech recognition system and the Google machine translation. More examinations are needed to promote students' engagement in language classes where Google Apps are employed. Studies can investigate the effect of the Google search engines and Google scholar in facilitating language researches conductivity. Other experimental studies may explore the integration of Google Apps with other social media applications such as Twitter, Facebook, or Instagram in enhancing language learning and improving English language teaching. In the field of English language assessment, researchers can investigate the effect of

designing class tests using Google forms in reducing students' exam anxiety. As for online and blended learning platforms, studies can develop course materials that incorporate Google Apps to facilitate learning. Other Studied are needed to investigate teachers' perception of using Google classroom suite in English language learning and its impact on students' engagement.

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Appendices

Appendix A

Table 2. *Researches on Google Apps and English language learning*

Authors	Date of publication	Research objectives	participants	Results
Kelsen	2009	The objective of the study was to investigate students' attitudes towards using YouTube in EFL classes.	College students	Students reported positive attitudes since they found YouTube was motivating and beneficial.
Starsma	2010	The researcher studied the effect of using Google Docs on students' engagement in language classes.	College students	It recommended using Google Docs to engage students in primary research in composition courses.
Lin & Jou	2013	Their study developed students' performance and motivation for learning English.	University level students	Students' motivation for learning and performance developed by applying

Dourda et al.	2014	The study aimed to improve students' reading and writing skills through online games.	Primary school students	Google web-based instructions. Results showed that using game-based learning that incorporates Google Earth improved students writing and reading skills.
Al-Tawil	2016	The study sought to find out how Digital Media can improve learners' English language learning.	High school students	Results indicated that Google Machine translation could support intentional language learning outside of the school.
Liu & Lan	2016	Their concern was to investigate an individual learner vs. a group of learners' motivation, vocabulary acquisition, and perceptions on using Google.	tertiary level	Google Docs enhanced students' motivation and involvement in EFL learning in a collaborative context.
Alakurt & Bardakci	2017	The study aimed at examining academicians' metaphorical perceptions related to Google applications.	Staff members	Academicians have a positive perception of Google applications.
Alnujaidi	2017	The author investigated learners' attitudes	College students	Students had overall positive

		towards social network sites and their effectiveness in English language learning.		perceptions and expectations towards Google +.

Appendix B

Table 3. *Studies concerned with Google Apps and writing skills*

Authors	Date of publication	Research objectives	participants	Results
Acar, Geluso & Shiki	2011	They studied the effectiveness of using the Google search engine in identifying and avoiding grammatical errors in writing.	EFL college students	The study concluded that the Google search engine helped students correcting their writing mistakes and identifying their errors.
Kessler, Bikowski & Boggs	2012	Their study investigated how web-based collaborative activities (i.e., using Google Docs) change the nature of collaborative writing.	College students	Students concentrated on meaning rather than form, and their grammatical uses became accurate. They were encouraged to participate more in the process of writing.
Zhou, Simpson & Domizi	2012	Using Google Docs to develop students' collaborative writing.	Undergraduate students	Google Docs is a successful tool for collaborative writing. Students also preferred the use of Google Docs in learning writing skills.
Geiller	2014	The aim was to use web search engines such as Google to self-correct writing errors.	Post-secondary EFL students	Google helped a group of EFL learners to self-correct several untreatable written errors and consequently

				improved their writings.
Suwantarathip & Wichadee	2014	The study compared two groups to find out the effectiveness of using Google Docs in students' writing performance.	EFL College students	The Google Docs group achieved better results in writing classes than the face-to-face group. They also showed positive attitudes towards using Google Docs.
Jeong	2016	The study explored EFL learners' perception of integrating Google Docs in a collaborative writing course.	College students	The study proposed Google Docs as a collaborative tool used to enhance learners' communication and collaborative learning.
Seyyedrezaie et al.	2016	The study examined the effect of Google Docs in the writing process. It also investigated students' perceptions of the causes of failure or success in writing courses.	College students	Students reported a positive attitude towards the implication of Google Docs, and they considered it as a cause for success in their writing performance. Besides, Google Docs led to an improvement in students' writing performance.
Yim, Warschauer, & Zheng	2016	The aim was to explore the challenges that affected how Google Docs integrated into classes.	Primary school students and teachers	Results showed that Google Docs provides accessibility for writing practice.
Yoon	2016	This research investigated the effectiveness of a web search engine, such as Google, in	Post-graduate students	Results showed that this reference suite aided the participants in solving both lexical and grammatical problems. However,

		solving some linguistic problems while completing writing assignments. It also examined the students' perceptions of using that reference suite.		some students found difficulties in using it.
Alsubaie & Ashuraidah	2017	They reported differences between the students' individual and collaborative work using Google Docs.	College students	Results indicated significant achievements in using Google Docs. Students considered it as a useful tool for their work.
Ebadi & Rahimi	2017	They explored the effectiveness of using Google Docs for online peer-editing on EFL learners' academic writing skills.	College students	Results showed students' positive perceptions towards the use of online peer-editing in academic writing.
Han & Shin	2017	The aim was to teach Google search techniques (GSTs) in a writing course.	EFL College students	Results indicated the importance of integrating GSTs in teaching writing and providing teachers' guidance and feedback to facilitate the writing process. Students reported that using the Google search engine was beneficial.
Seyyedeh & Seyyedrezaie	2017	The study compared the effect of Google Drive versus face to face	EFL College students	Google Drive group outperformed face to face one, and the latter had more writing apprehension

		environments on students' writing performance and writing apprehension		compared to the other group.

Appendix C

Table 4. *Studies on Google Apps and reading comprehension*

Authors	Date of publication	Research objectives	Participants	Results
Park	2013	The aim was to present a practical guide for instructors to promote students' engagement in reading classes by using web 2.0 tools such as Google Docs.	College students	NA
Karnal & Vera	2013	The study examined the extent to which it is possible to comprehend a text translated by using a machine Google translator.	Undergraduate learners	The results represented the reading strategies that non-proficient readers use to comprehend translated texts.

Appendix D

Table 5. *Studies on Google Apps and speech recognition system and speaking skills*

Authors	Date of publication	Research objectives	Participants	Results
Ashwell & Elam	2017	The aim was to use the Google Web Speech API to score elicited imitation (EI) tests.	EFL learners	The Google Web Speech system helps in assessing pronunciation and the

				grammatical competence of EFL learners.
Daniels & Iwago	2017	The study aimed at evaluating the effectiveness of Google Speech Recognition (GSR) in transcribing L2 learners' speech.	EFL undergraduate students	Results reported the accuracy of speech recognition engines.
O'Brien	2017	The researcher aimed to develop a system to design material for CALL courses that incorporate the Google speech recognition system.	NA	NA
Awada & Diab	2018	The aim was to investigate the effect of Google earth and Wikis on developing oral presentation skills and motivation.	EFL higher education learners.	Results showed that integrating Google earth and Wikis led to an improvement in students' oral presentation skills, active learning, and motivation.

Appendix E

Table 6. *Studies on translation and Google Machine translation*

Authors	Date of publication	Research objectives	Participants	Results

Garcia & Pena	2011	The study investigated the effectiveness of Google machine translation (MT) in students' second language learning.	L2 beginners students	MT helped learners to communicate more in the target language.
Kadhim et al.	2013	The aim was to test the translation quality of the Google machine and Babylon systems in translating Arabic news headlines into English.	-	Results indicated the clarity and accuracy of Google MT.
Azer & Aghayi	2015	The aim was to evaluate the translation quality of machine translation systems in translating from English to Persian	-	Results indicated that Google machine translation produces an intelligible and acceptable translation.
Al-Tuwayrish	2016	The study examined the role of Machine Translation in everyday situations.	-	The study demonstrated the pros and cons of MT.
El-Banna & Naeem	2016	Their study aimed at using machine translation to help students avoid common errors in translation.	Freshmen	The Google machine translation enabled the students to improve their translation performance.
Darancik	2016	This study examined the	NA	The Google machine

		effect of a data-based Translation Program on the correct use of language.		translation program is acceptable; however; learners should review the translation by themselves.
Ghasemi & Hashemian	2016	The main aim was to conduct an error analysis to investigate the errors found in the translation from Persian into English and vice versa.	NA	They found no differences between the quality of Google machine translation from Persian into English and vice versa.