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## *Articles*

### **Politeness Strategies in Japanese Requests      6**

Yuka Matsuhashi

### **Politeness and Requests via Email   27**

Juan David Rodriguez Rios

### **Sherlock Holmes Humour in Translation      31**

Jeroen Bode

### **Mass Media and Its Effect on Children in Bhutan      45**

Tashi Lhamo

### **My Facebook World      52**

Hamdard Hamdullah

## *Language Learning and Teaching*

### **Employing Narrative Frames for Needs Analysis: The Case of a Newly-Hired Teacher      59**

Takaaki Hiratsuka

### **Google Apps for Education: From Initialization to Implementation      66**

Joshua Krill

## *Around the World*

### **Smile Tourism      76**

Shinichi Nagata

## *Technology*

### **The Versatile Dynamic QR Code: Using Dynamic QR Codes for Class Activities      80**

Brent Wright

# Google Apps for Education: From Initialization to Implementation

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**Abstract:** Although research has indicated that a number of benefits such as increased learner motivation and engagement may be gained through the integration of technology into the classroom, these benefits are only possible if technology is used in a meaningful way. Occasionally showing a video in the classroom and other such one-time activities are not, by themselves, an effective use of technology and appear more as occasional treats for students rather than a significant part of the class' overall curriculum. Furthermore, with student-centered learning becoming the focus of most EFL/ESL classes, teachers must have a variety of ways to keep their students interacting in English. The teacher, as facilitator, is then responsible for monitoring and assessing the quality of these interactions. One possible solution for accomplishing both of these tasks while making technology an integral part of a given curriculum is to utilize current technology that is available and already familiar to students.

The Google Apps for Education suite is one such solution. The purpose of this study is twofold. The first is to give an overview of setting up the Google Apps for Education suite, including the pros and cons of such an undertaking for educational institutions. The second is to discuss a variety of classroom activities that can be enhanced through the use of this set of applications. This study will show that not only does the Google Apps for Education suite allow for greater cooperative learning between students, it also allows teachers to gain insight into the thought processes of students and the interactions they are having with their peers. Students can also get feedback on their work more quickly and easily than with traditional methods, redefining the standard writing process used at most academic institutions presently.

Keywords: Google, classroom management systems, cooperative learning, collaboration, productivity, cloud computing

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## Introduction

Not long ago, Google was just one of many websites that someone could visit when they wanted to do a web search and find some piece of information. In more recent times, Google has expanded into a number of different areas including communication (email, voice/video chat), social media, and web-based software. Given the broad reach that Google now has with virtually all devices that are connected to the Internet, it might well be true that if you are not in Google, you do not exist (Mans, 2010).

Transitioning from search engine provider into other areas of web-based technology helped Google

to increase its user base and has also broadened the types of audiences that use its services. As these services evolved, they became viable IT solutions for businesses. Furthermore, secondary and tertiary educational institutions increasingly began looking to Google to meet their online communication needs (Young, 2006). Aside from the multitude of functions Google's suite of applications provides, it was also considerably more cost effective when compared to other in-house solutions. Previously, the cost of a Microsoft Exchange on-premise email solution, including hardware, software, and staffing costs, totaled \$16.29 per user per month (Herrick, 2009). Google Apps for businesses costs \$50 per user per year, or approximately 75% less than the previous pricing of Microsoft Exchange server. Meanwhile, Google Apps for Education, the edition exclusively for non-profit academic institutions, is free of charge (Cost Comparison section, ¶1). The

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ability to save an institution hundreds of thousands, or even millions, of dollars made Google a compelling option based on price alone. This drove Microsoft to recently lower prices for both businesses and academic institutions. On the education side, Microsoft has made access to a basic application suite free of charge. This version lacks the ability to use mobile versions of Microsoft's applications amongst other features, however. Access to the premium suite of applications and features comparable to that of Google Apps for Education now costs \$2.50 per user per month for student accounts and \$4.50 per user per month for faculty accounts as of the time of writing ("Office 365," n.d.).

Once an academic institution chooses to adopt Google Apps for Education, the signup process is quick and verification involves as little as uploading a small piece of code to the institution's homepage. As Barlow & Lane (2007) noted, however, the transition process takes more time (up to a few weeks), depending on the number of student and faculty accounts that need to be moved to the service. Academic institutions such as junior and senior high schools, which typically do not provide students with school email addresses, have to create new accounts unless students are permitted to use a personal Google mail account for their classes. For institutions with existing single-sign-on environments used to access services such as Blackboard, Google Apps for Education easily integrates without the need for students or faculty to create new user names and passwords (pp. 8-9).

Once Google Apps for Education is launched at an institution, teachers have access to a number of quality applications that can be used to enhance their classes and increase the amount of cooperative learning that takes place. Up until now, if a teacher wanted to have students cooperate on a task that involved the use of a computer, that typically meant a class in a computer lab with pairs or groups of students gathered around a single computer, except in instances of group research, but this involves very little interaction between group members. Conversely, the issue with using one computer for a pair or group of students is the tendency for a single user to dominate control of the mouse (Moed, 2009). By making use of the Google Apps for Education suite, teachers can create cooperative tasks that allow students to each use their own computer. Best of all, these tasks can be undertaken by students not only

inside the classroom, but also outside of class as long as students have access to a computer with a connection to the Internet for accessing their Google account. This eliminates the need for teachers to relocate to a computer lab whenever they have an idea for such a task. The ability to create engaging and worthwhile cooperative tasks, however, is gained from having an intimate knowledge of the applications that comprise the Google Apps for Education suite and what types of tasks can be done with each.

### **The Applications – Google Mail**

While Google Search is inarguably the most recognized of all of Google's applications, it can also be used without having any sort of account with Google and, as such, will not be discussed as part of the application suite that users gain access to by having an account. The cornerstone of that suite, then, is Google Mail, or Gmail, which acts as a central hub and is directly integrated with most of the other applications. One of the biggest advantages Gmail has over other mail clients is the amount of storage space it gives each user. Personal accounts allow for 15 GB of storage, but in the Google Apps for Education edition, Gmail comes with unlimited storage space. This storage space is shared with Google's cloud storage system, Google Drive.

Further distinguishing itself from other solutions, Gmail has a unique labeling and search system for emails. From the onset, Gmail has default tabs that it will automatically file emails under, including primary, social, promotions, updates, and forum tabs. If a user wants certain emails filed under a tab other than the one that Gmail automatically selected, they need only drag the email to the desired tab and Gmail will remember the selection going forward. Gmail also includes the standard function of starring important messages and there is an option for displaying all starred messages across all tabs under the primary tab as well.

These tabs only apply to current emails as a means of organizing a user's inbox. Gmail includes a separate labeling system for filing emails that a user has read and wishes to save. Much like the tabs, labels are completely customizable. Students could potentially have labels for specific subjects, projects, peer groups, or for emails sent from specific users, such as teachers. Teachers, too, can make great use of the labeling system for keeping track of assignments submitted by students. An email re-

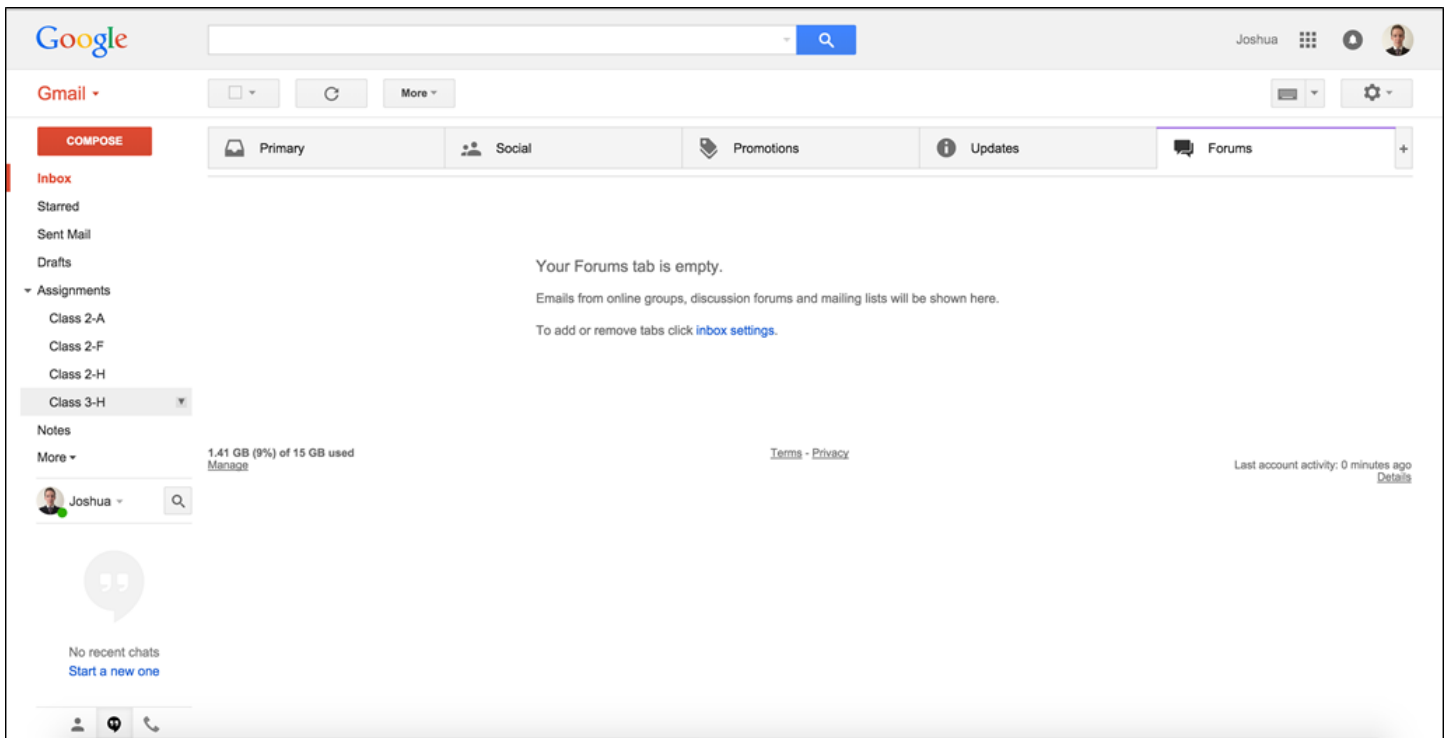


Figure 1. Tabs and custom labels in Google Mail.

ceived with an attached file for an assignment can be labeled with that student’s class, section, and a label signaling that the assignment is ungraded. Later, when the instructor finishes grading the assignment and returns it to the student, the “ungraded” label can be removed and a label signifying grading completion can be assigned to the email or the email can be deleted entirely.

Gmail also includes its own powerful search engine for browsing both emails located in the inbox as well as archived messages (Adams, 2008, p. 97). Much like Google Search, users can ask for the email search results to include only those emails that fit certain criteria, such as containing certain specified words or having come from a certain sender. Users can exclude emails from a search in the same way. Search criteria can also use inclusive and exclusive criteria together, looking for emails that contain certain elements while excluding those that meet a separate set of criteria. For a teacher or student who may accrue thousands of emails within a few years, having a search engine for browsing those messages integrated into the system is integral for effective workflow and productivity. Otherwise, considerable time can be wasted trying to find a single message.

## Google Drive

Google Drive is the way in which Google uses cloud computing to augment the rest of its suite of applications. While cloud computing covers many different areas of IT and can entail many types of services, at least for now Google Drive operates only in the realm of cloud storage. With cloud storage, it is best to think of the storage space in the same way as a type of external hard drive or server. In this case, the servers are being maintained and operated by Google (Buck, 2009). In the case of a user’s own computer having a hard drive malfunction and losing all of the data they had stored there, any data stored on Google Drive can be recovered.

As mentioned before, Google Apps for Education users receive unlimited shared storage for both their Gmail and Drive accounts. Currently, the education edition of Microsoft’s OneDrive offers 1 TB per user, while popular cloud storage service Dropbox offers only 2 GB for free accounts. Access to such a considerable amount of storage allows users to download and store all of their important files directly in Google Drive, which is integrated throughout the rest of the application suite and also into several popular websites and smartphone applications. Just in the Google Apps for Education suite alone, all applications have the option to save directly to

Drive.

Files on Google Drive can be accessed in several ways. The first is by installing the desktop application onto a computer that creates a Google Drive folder on the local hard drive. Files stored online using Google Drive will then be downloaded to this folder and any files placed into the folder will be uploaded and synced to Google Drive as well. Files deleted from this folder will also be removed from Google Drive, but files that are mistakenly deleted can be recovered if a user takes action quickly enough. If a user does not wish for certain files to be downloaded to their computer but wants to keep them on Google Drive, there is also the ability to choose which folders are synced to the computer.

The second method for accessing Google Drive is directly through Google's website when a user logs onto their account, the same way they would access their email via Gmail. This means that files stored on Drive can be downloaded to any computer that has Internet access for logging into a user's account. For students and teachers, this eliminates the problem of forgetting to bring a file to school to pass on to a classmate or co-worker. Students that forget to print out an assignment to turn in to a teacher can simply do so at school provided the file was saved to Google Drive. Drive similarly gives users composing an email using Gmail access to their files, as they can include attachments by linking files directly from Drive even if those files do not physically exist on the computer they are using to write the email.

Finally, files on Google Drive can be accessed via Google's own smartphone and tablet applications, or a small number of third party applications specializing in document viewing and editing. In the case of Google's own mobile applications for Drive, any file can be shared, printed, linked to, or deleted directly inside the app. You can also select to open the file using other applications located on the smartphone or tablet, such as word processing applications used to edit documents or a video player for viewing video files.

Google Drive is not just for storing files for personal use, however. Users can create shared folders that they can invite collaborators to via email. Once another user accepts an invitation, the shared folder will appear in their Google Drive along with all of the files contained within the folder. When a file in a shared folder is changed, the updated version of

the file is synced to all users that have access. Likewise, a file deleted from a shared folder by one user will cause all collaborators to lose access to the file. This sharing function not only allows teachers to share materials with their students and co-workers, it allows for easy sharing of materials between the students themselves. This is particularly useful for group projects where individual students or pairs within the group may be responsible for different portions of the project.

## Google Documents

As previously mentioned, the Google Apps for Education suite allows teachers to increase the amount of cooperative learning in their classes. The unique use of technological tools also helps to increase student engagement. While Gmail and Drive are means for sharing and providing access to files, it is really the rest of the applications in the suite that make Google Apps for Education a powerful educational platform. This starts with Google Documents, also known as Google Docs.

Google Docs is a word processing application similar to Microsoft's Word or Apple's Pages. It even supports the former's documents, which can be edited directly in Google Docs and saved in the original format. The true potential for collaborative learning becomes apparent when creating documents in Google Docs' native format, however. Documents in the native format are all created and edited online in an Internet browser window. Similarly to folders in Drive, documents in the native Google Doc format can be shared with collaborators. If two or more users have a shared document opened at the same time, anything written by one user will be instantly viewable by the other users. During a live writing session, users are shown who created what content as it is added to the document. In the case of collaborators viewing the document after certain additions are made, and especially for teachers viewing completed assignments, a revision history is available thanks to the continuous auto-save feature also included in the native Google Docs format ("Google Apps Education Edition," 2010). As Figure 1 shows, the revision history indicates the exact date and time that a revision was made along with the author. Clicking on a specific revision will highlight the text or element that was added at the time in the color indicated. The teacher and other group members having the ability to view contribu-

tions helps promote a work environment where ideally students all put forth an equal amount of effort to complete the task.

These elements all lend themselves to collaborative learning tasks where students can get corrections and feedback from one another as well as learn from each other's ideas during live writing sessions. In research by Sadik (2008), a collaborative digital storytelling task, done in groups, demonstrated greater engagement by students with the content of their projects, but it also showed neither evidence of collaboration by students nor awareness of the views and opinions of fellow group members (p. 499). It is in areas such as this that working with Google Docs can aid teachers and students by making all aspects of the writing process cooperative rather than simply combining separately written sections together to form a final product, as is the case with many group projects in their traditional formats.

Google Docs not only provides a new avenue for collaborative production, it also changes how feedback is given and received. Traditionally, students only receive feedback on their work in class, either when a teacher returns work that the student produced or as part of a peer feedback exercise. In the case of feedback from the teacher, this usually comes days after the student has turned in the assignment, which itself could be several days after the work was written. This changes with Google Docs. Aside from the standard editing mode, documents in the native Google Docs format can be switched into a "suggesting" mode that allows the user to make edits with commentary. Any deletion or swapping of words will show the original word crossed out with any new words shown in a different color of text. If the editor wants to explain their changes, they can do so in a comment that will accompany that particular edit on the right hand side of the document when viewed by the original author or anyone else with access to the document. Figure 2 below shows an example of how a student's journal in a weekly English conversation class might be

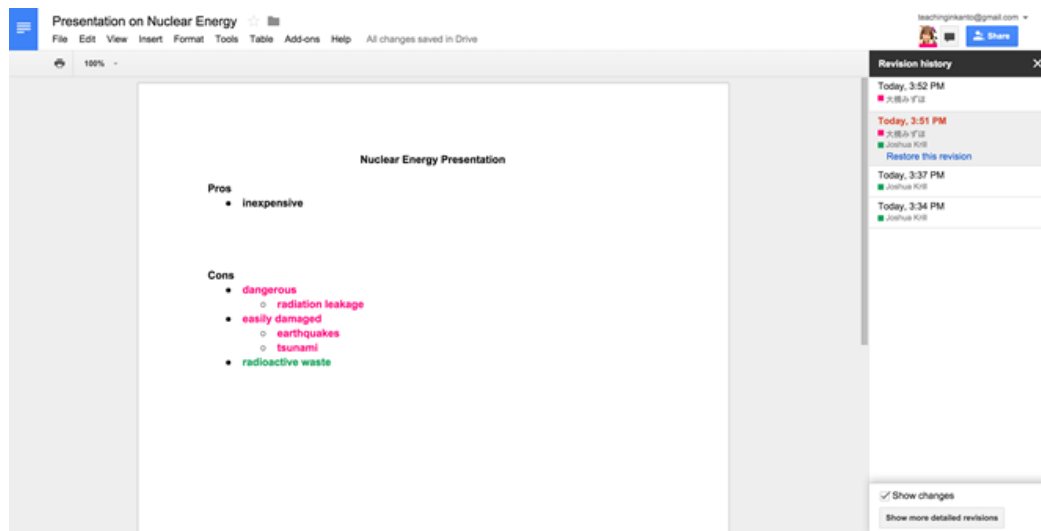


Figure 2. Collaboration in Google Docs.

corrected by the teacher.

The ability to receive feedback as a document is being written, or shortly thereafter, completely changes the writing process for students as well as how involved teachers can get in that process. If a student seems to be struggling or going off topic, a teacher can guide him or her through commentary well before an assignment is due. Peer feedback sessions can also be assigned for homework instead of devoting class time to the process should a teacher wish to do so. This amount of flexibility in how certain portions of the writing process are carried out has never before been possible. Trilling and Hood (1999) stated that it is imperative that educational technologies become able to give learners access to help at any time in order to have support at any stage of the learning process, be it problem solving, design, or inquiry (p. 16). Google Docs is the stand-out application of the Google Apps for Education suite that does exactly that.

## Google Forms and Google Sheets

Another versatile application with a variety of classroom uses is Google Forms. This application allows users to create customized forms for any number of purposes. If a teacher wishes to conduct a class survey to get student feedback, they can put their questions into a form and submit it to their students to fill out. Figure 3 below shows an example of such a student survey. Students can likewise use Google Forms in a similar way for research that involves questionnaires. Rather than having to go through the trouble of distributing questionnaires face-to-face, students have the ability to give their

questionnaire to anyone with an email address. Teachers can also use Google Forms to create a template for use with peer reviews to ensure that specific questions about a student's work are answered. Forms are also a versatile way to handle input of normal classroom observations, such as behavior or participation. Instead of writing that information down into a physical gradebook, a teacher can input it into a Google Form on their smartphone or tablet in the classroom. While this may appear the same as writing the information down, it is how the data from Forms can be used that makes it different.

In all cases, data gathered from a form created in Google Forms can be delivered to a spreadsheet in Google Sheets, Google's version of Microsoft's Excel or Apple's Numbers. This spreadsheet can be shared in the same way as a document in Google Docs can, meaning that a teacher can choose to allow students to see the results of a survey and a student can view what their classmates wrote when peer reviewing their work. Likewise, a teacher keeping track of anything from attendance to grades for individual students via Google Forms can share that data with the student. These tools can help to give students a clearer picture of their performance in a class whereas previously students may have been unaware of how they were being evaluated for such criteria as participation and effort.

### Google Calendar

While most people are familiar with how calendar and planner programs work for keeping track of their own personal schedules, Google Calendar is one of the few that can be shared with others. Much like the applications mentioned above, collaboration is a central theme in Google Calendar as well. One of the biggest benefits of being able to share calendars is that teachers can write out the entire schedule for a

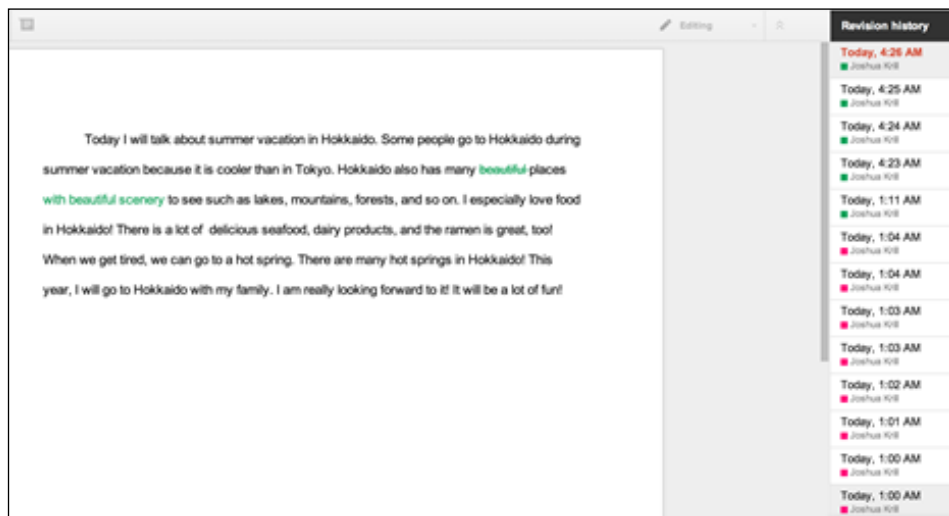


Figure 3. Revision history in Google Docs.

term, including topics for each class meeting and assignment due dates, and then share the calendar with students. As Schneckenberg, Ehlers, and Adelsberger (2011) described, this allows students to visualize the course schedule, making it easier for them to plan well in advance for more difficult topics or time-consuming projects (p. 757). When a calendar is edited to include revised due dates or other changes, these are reflected across all participants' calendars, so students no longer have to worry about writing down such changes when a teacher mentions them in class. Students can create their own shared calendars as well, using them to schedule meetings or self-imposed deadlines when working in pairs or groups on an assignment.

Users can also share a calendar in which they have included appointment times. These times can be divided into slots using whatever interval of time the user wishes. When someone claims a time slot

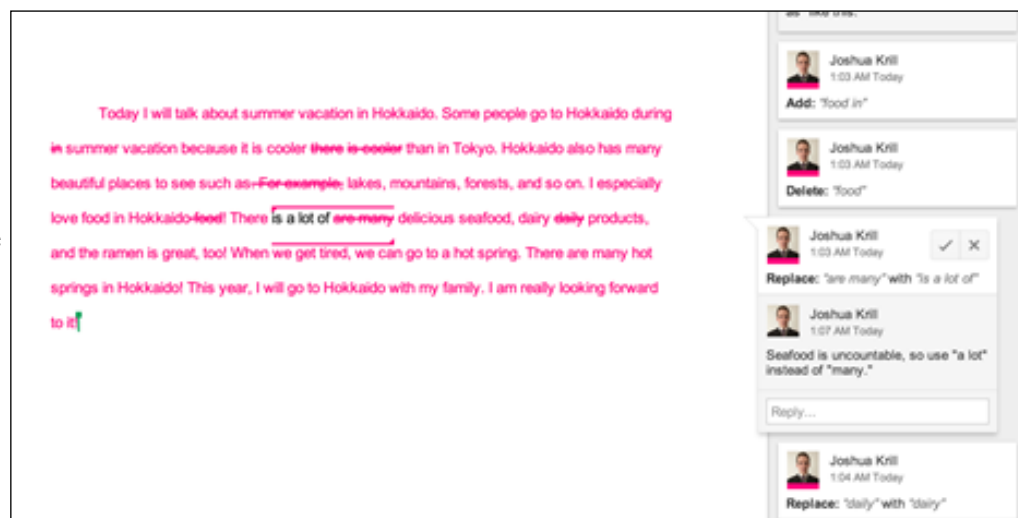


Figure 4. Example commentary in Google Docs.



on the appointment calendar, that choice is removed for others viewing the calendar without revealing who signed up for that time. An email is then sent to the owner of the calendar letting them know that the particular time slot was filled. This type of calendar can be used for helping students schedule a meeting with a teacher during their office hours or even as a convenient way of scheduling parent-teacher conferences.

### Blogger

While there may be better options for blogging services than Google's own Blogger, as part of the Google Apps for Education suite, it remains a good option for students and has privacy features that not all blogging services offer. Blogs have been used in classrooms for years now as a medium for students to write reflections on course readings or to create a writing portfolio showcasing all of a student's work for a class. Kim (2008) found that blogs promote a sense of ownership that helps to lower anxiety about posting work publicly while also leading to increased motivation (p. 1344). Again, privacy features exist so blogs can be set to be viewable only by peers as specified, limiting the scope of the public audience for a student's blog. Having other students view and comment on each other's blogs as a form of peer feedback is another way to increase motivation and engagement as well. Such activities also foster a sense of community. In research by Halic, Lee, Paulus, and Spence (2010), results showed that sense of community was directly related to perceived learning. When students felt a strong sense of community by connecting with their peers using blogs, they reported more satisfactory learning experiences. They also found that interaction with the instructor via the blogs was important to the level of perceived learning by the students.

Much like the other apps in the suite, Blogger

The image shows a Google Forms survey titled "End of the Year Survey". The form includes the following sections:

- Form Description**
- What did you like best about this class?\*** (Text input field)
- Was there anything that you did not like or would change about this class?\*** (Text input field)
- On a scale from 1 to 4, how difficult was this class for you?\***  
1 2 3 4  
Very Easy     Very Difficult
- On average, how many hours did you spend studying or doing homework for this class each week?\***  
 Less than 1 hour  
 Between 1 and 3 hours  
 Between 3 and 5 hours  
 More than 5 hours
- Please write any additional comments you have here.** (Text input field with edit, copy, and delete icons)

Figure 5. Sample student survey being written using Google Forms.

also has a mobile version for tablets and smartphones. This allows students to write, view, and comment on blog entries during times when they might otherwise have been unable to do so, such as during commutes to and from school using public transportation. Keeping students connected to the community of their class at all times can better help students to perceive their role in that community.

### YouTube

Google Search was not included in this paper because it is an application that is accessible to the public without having a Google account. YouTube similarly falls into this category, but unlike Search, YouTube has certain features that are useful for teachers and students that are only available with a Google account. For example, users can create their own YouTube channels, which have privacy functions to control who can view the channel and the videos contained on it. Teachers can make a custom channel for a class to which they add videos containing content that is relevant to topics covered. This is an ideal way for introducing realia that can be shown in class, assigned as homework, or simply kept as optional viewing. Having the videos organized into a YouTube channel means that students

always have access to the videos at anytime. Similarly, a teacher can make a private channel to which students can upload the results of an assigned video project. This provides an easy way for the teacher and students to access the videos and comment on them.

### **Google Classroom**

Google Classroom, released prior to the start of the 2014-2015 school year in the United States, is the newest addition to Google Apps. Currently, it is exclusive to the Google Apps for Education suite and is not available to personal users or to those using the Business edition. Google touts their Classroom app as a diverse Learning Management System (LMS) due to it being integrated with their other apps. Classroom gives teachers the ability to create “classes,” which can be thought of as groups into which they can categorize students. Teachers can then manually add students to each “class” or provide a unique link to students for joining. The landing page of the class then acts as a centralized hub for most activity in the course.

Teachers have the ability to post every-thing from announcements to assignments directly to the class page. In the case of assignments, instructors can add files for assignments directly from Drive, selecting whether students can merely view a file or edit it, or whether a separate copy should be made for each student. If the assignment were, for example, a worksheet to be completed and turned in, a teacher would select the option of making a copy of the worksheet file for each student. The name of the student would then appear at the end of the file name of the respective student’s copy. Upon completing the assignment, students submit it back to the teacher right via the class page. Teachers can then view the submission and assign a grade to it. Grades for submitted assignments are viewable to students as soon as they are given. Teachers can also post links in real time to websites or even YouTube videos, as teachers can open a separate smaller window for searching the YouTube database and selecting the YouTube video they wish to post from the results.

### **Conclusion**

Google Apps for Education is a platform that has numerous benefits for educational institutions, for teachers, and especially for students. It has been

shown that Google Docs has the potential to redefine the writing process for assignments by allowing students to get feedback more quickly so that they can immediately make use of teacher and peer feedback. Students can also cooperate with each other even if they are unable to physically meet outside of the classroom or work on an assignment at the same time. Teachers, also, can get feedback from their students via surveys in Google Forms with the data updated and presented in real time via a spreadsheet in Google Sheets. Applications like Google Calendar allow teachers to share course schedules with students so that they can easily visualize how the course will proceed and can better keep track of when assignments are due. These applications as well as others increase the productivity of both teachers and students while transforming classes into a wholly student-centered, cooperative learning environment. The teacher’s role as facilitator is also expanded to outside the classroom where they can observe student interactions during group activities as well as gain insight into individual student thought processes simply by reviewing the revision history of an assignment.

Google Apps for Education has also shown that it will increasingly become a more versatile tool in the future. Not only are features being added to each individual application consistently, but also new applications, such as Google Classroom, are being developed and integrated as time goes on. As the Education edition is free for any non-profit educational institution, the only cost to adopting this tool is the time it takes to initially setup and to train faculty on its use. With most technology in classrooms today being used for no more than presenting realia to students via images and videos, Google Apps for Education can give teachers tools that can engage students the same way a video does while also providing means for creating meaningful activities that allow students to construct their knowledge in different ways.

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