How Google Can Help Promote 21st Century Skills

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Abstract

A university as an educational institution has an obligation to prepare students for the future. However, how do you prepare students for a future that is not yet known, let alone develop curricula for technologies that currently do not exist? There appears to be a shift in which both educators and students see a need to focus on skills that will help them to adapt to this rapidly transforming society. These technological and professional skills have been called 21st century skills, and should be seen as an essential part of a student's development. One resource that is accessible to educational institutions is Google. For most students, an integral part of their future lies in possessing the professional skills they need to thrive in the workplace, and the technological skills necessary to participate and succeed in day-to-day interactions. Through interviews and surveys, this qualitative study investigates how Google can assist both teachers and students in developing these 21st century skills. This paper argues that Google is one of the most efficient resources available and that its products offer a variety of ways to promote the skills that students need to succeed in academia and in the professional arena.

I. Introduction

We can all acknowledge that technology is expanding and developing at a fast pace. What we may disagree on is the extent to which educational institutions are prepared to deal with and embrace these changes, particularly in higher education (HE), where innovation, professional skills, and digital literacy are becoming increasingly more relevant to the majority of students who will soon see themselves entering the work force. These skills, which are essential for success in today's rapidly changing society, have been coined 21st century skills, and according to Trilling and Fadel (2009), two of the leading 21st century learning experts, these skills incorporate learning and innovation, digital literacy, and career and life skills. Moreover, 21st century skills emphasize the ability to question, explore, and investigate possible solutions. This research looks into the ways in which Google supports a 21st century approach to teaching and learning. It is argued that the use of Google products in the classroom can help students develop these skills, drawing attention to the need for real time interactions, the ability to question and collaborate with both educators and peers, and the need to develop real life skills that are transferable outside of the educational institution.

II. Literature review

1. Digital literacy and 21st century skills in Japanese higher education

  As with any group of individuals, computer literacy in Japanese universities varies. According to Murray and Blyth (2011), two university professors who sampled 103 students in 3 different Japanese universities, many Japanese students know more about computer literacy than they give themselves credit for. However, Sevakis (2016) cites a 2015 study conducted by the Japanese Cabinet Office that states, "only 30% of Japanese high schoolers use laptops, and only 16% use desktop computers. (In the US, 98% of our teenagers use one or the other, with similar numbers out of the UK)." This study was written at a time when both American and British teenagers, like their Japanese counterparts, also have access to smart phones, while a small computing device, it does not have the full functionality of a personal computer. By the time the average Japanese student enters university, they will have had a lot less opportunities to become skilled at using computers and the technology that often accompanies them. Furthermore, an article appearing in The Mainichi, a major Japanese online newspaper, stated that as of 2015 the number of young people in Japan who were computer illiterate was increasing due to smart phone use, a lack of technological knowledge, and the increase of economically-challenged households (2015). Many Japanese HE institutions require students to take computer courses in the first and second year, but the majority of the courses are basic introductions to software applications like Word and Excel. How well they are preparing students to utilize these resources outside of the classroom remains to be seen, but there are at least attempts being made to ensure that Japanese students in HE are familiar with the basics of computer literacy.

  Current research (Murray and Blyth 2011; Ueda, Sugino & Abe 2014) also suggests that teachers in Japan who are trying to cope with integrating these rapidly progressing technologies into the classroom are utilizing computer-assisted language learning (CALL), computer-mediated communication (CMC), social networking services (SNS) and other emerging media, like blogs and online video. However, there should be a specific focus on how these modern advancements are used to prepare students for the future. According to Brooks-Young (2010), a leading technology-in-education expert, 21st century skills are "both content knowledge and applied skills that today's students need to master to thrive in a continually evolving workplace and society" (6). As such, HE students in Japan need to be prepared to communicate and collaborate with both their teachers and their peers, something which is often lacking or difficult to achieve in Japanese universities. As Burrows (2008) explains, sometimes socio-cultural differences can "…even render opportunities to communicate and express feelings unproductive" (17). Though these socio-cultural differences exist, participation, including communication and collaboration, is still essential.

An exploration of the research illustrates that a number of these 21st century skills have long been at the center of education, however, "how these skills are learned and practiced in everyday life in the 21st century is rapidly shifting" (Trilling & Fadel, 2009, 2). As such, Japanese HE needs to be prepared for this shifting paradigm. Of course, synthesizing sources, evaluating, assessing and the sharing of information requires a certain level of sophistication which can be difficult for any student and is often seen as the end result of education. Nonetheless, Japanese HE students need to learn that collaboration is as essential in the classroom as it is in life. Author of *Digital Literacy* Paul Gilster explains in an interview with Carolyn R. Pool (Pool 1997), an author for *Educational Leadership*: "Digital literacy is the ability to understand information and –more important– to evaluate and integrate information in multiple formats" (1). Thus, it is essential that today's students know how to access information, as well as be able to scrutinize, assess, and combine it to form meaning. In addition to being able to handle information in a variety of formats, research indicates students also need to be able to both deconstruct and construct meaning, and to have the ability to disseminate this information. Therefore, the challenge facing many Japanese HE students is not only in becoming digitally literate, but becoming proficient in these 21st century skills.

2. Task-based language teaching

Task-based learning (TBL) projects require students to collaborate, cooperate, and to be creative (Willis and Willis 2007). When combined with technology like Google products, TBL then becomes a crucial element in preparing students for the 21st century. Students need to be able to interact, negotiate, and combine ideas if they are to succeed. The creation of new TB projects then becomes the focus, as examples of these projects are not necessarily missing in the literature, but are rather continuously maturing and transforming as technology develops. As TBL places emphasis on the task, that is, the process, and not specifically on the outcome or product (Nunan, 1989), it allows students to pay attention to target language development and to increase their confidence. Nunan (2004) states that the task should also have a sense of completeness and be able to stand alone as a communicative act in its own right. Thus, it follows that tasks can be projects in the Japanese HE classroom in which students are focused on the experience rather than the product, and ones in which the teacher can prescribe specific learning goals. Furthermore, it has often been pointed out in the literature (see for example Ellis 2006; Willis 1996) that processes described in the set task all have specific phases, which help to give the task a sense of legitimacy and give both the students and the teacher a feeling of balance and purpose. However, it is simply not enough to assign a specific task to a group of students; when teachers combine TBL with another major methodology, such as collaborative learning, the process becomes even more finite. Of major importance then is the particular design of the task, the delegation of tasks, and that the task

be directly connected to and help students achieve their specific learning goals（Barkley, Cross & Major, 2005）.

Van den Branden（2012）discusses the three elements of task-based learning: the nature of the task, the role of the teacher, and the outcomes. He explains further that, "task based syllabuses do not chop up language into smaller pieces, but take holistic, functional tasks as the basic unit for the design of educational activity"（133）. These elements offer an apt framework to discuss the use of Google in Japanese HE classrooms. In addition to learning about technology, such group activity also effortlessly integrates opportunities to develop different skills: working cooperatively, dividing the tasks, problem solving, critical thinking. As van Lier（2002）noted:

> When we design our lessons using activity as the focal unit, language becomes a constituent alongside movement, gesture, experiment, manipulation focusing planning, judging … Language is naturally supported by and supportive of social activity（2002. 159）.

3. Google products for educators

Many users are familiar with Google's search engine; even the phrase "Google it" has become synonymous with searching, but Google has so much more to offer. A quick look at a blog post from Zesty titled "Amazing list of every Google product and how we depend on them"（2010）and the article "Over 201 Google products and services you probably didn't know"（Mohan 2016）can help people get a fairly good idea of the available resources. Google has certainly placed itself in a special category among educational and productivity tools with over a billion Search, YouTube, Gmail, Chrome, Map, Android and Play users（Mohan 2016）. Even people who have never used Google products outside of its search engine or Gmail can become instantly familiar with the Google universe by comparing the products to existing software and applications.

Table 1: Google products and comparisons

Function	Google	Apple / Microsoft / Other
Storage	Drive	iCloud
Word-Processing	Docs	Word
Spreadsheets	Sheets	Excel
Presentations	Slides	PowerPoint
Instant Messaging/Conferencing	Hangouts	FaceTime
Social Network	Google+	Facebook

It should be stated that though these applications resemble their possibly better-known counterparts, they are not identical. A good resource which illustrates some of these nuances is Scott Matteson's "10 comparisons between Google apps and Office 365" (2013). In addition to those mentioned above, here are a few of the more widely-used Google applications and products used by educators:

Table 2: Google products and functions

Function	Google
Browser	Chrome
Video Content	YouTube
Satellite Imagery	Earth
Directions	Maps
Mobile Operating System	Android
Application Store	Play
Blogging	Blogger
Scheduling	Calendar
Image Creation	Drawings
Discussion & Question	Moderator
International Chat	Mystery Hangouts
Visual Search	Goggles
Notifications	Alerts
Digital Book Store	Books
Current Events	News
Photo Editing and Sharing	Photos

Many of the productivity and educational applications that Google offers are free. In fact, anyone with a Google account has automatic access to any of the Google products. Furthermore, Google offers a plethora of online content to help you manage, create, and expand your knowledge of their products. The Google for Education Training Center offers free training courses for anyone wanting to learn more about Google products and their uses. There are also free certification courses that require a small fee for the final examination. Please refer to the table below to get a better understanding of what the training center offers:

Table 3: Google for Education Training Center

Training	
Fundamentals Training	Advanced Training
Devices Training	
Trainer Courses	
Certification	
Educator Level 1	Educator Level 2
Certified Innovator	
Certified Trainer	

4. The focus and rational of the research questions

As with any technology, Google and its uses are constantly changing, adapting, and evolving. While exploring the research, the uses one can find for the products are continually shifting as new technology replaces old, and as educators find new and creative uses for, and sometimes limitations to avoid, when dealing with said technology. As this research is exploratory, these questions can no doubt serve as a starting point for future research. The research questions are:

1. In what ways do teachers use Google in the classroom to promote 21st century skills?

2. What specific Google tools do teachers recommend for educators and how do they use them in their classroom?

III. Method

1. Theoretical Framework

This research works within a Technological Pedagogical Content Knowledge (TPACK) framework, which focuses on the correlation between technology, pedagogy, and content. This paper seeks to explore the technology that is being put into use, which is unique to and connected by the educator's own approaches and methodologies, as well as their specific content goals. This framework was created by Mishra and Koehler (2006) and extended from Shulman's (1986) Pedagogical Content Knowledge framework to include the central component of technology. In addition to exploring these relationships, the framework also emphasizes the emergence of these new and evolving technologies and conversely, the new ways of exploring, analyzing, evaluating, and creating the content. Koehler's own web site (2011) gives the best illustration of how the framework can be used within this study:

> Effective technology integration for pedagogy around specific subject matter requires developing sensitivity to the dynamic, transactional relationship between these components of knowledge situated in unique contexts. Individual teachers, grade-level, school-specific factors, demographics, culture, and other factors ensure that every situation is unique, and no single combination of content, technology, and pedagogy will apply for every teacher, every course, or every view of teaching. (TPACK)

Thus, the more information we have about the specific educational context, such as class, methodology, or information about the design and purpose of the lesson, the easier it will be to demonstrate how these resources can be used to aid Japanese HE students in acquiring 21st century skills. Furthermore, assuming each educational context is unique and technologies are constantly emerging and adapting, this framework also allows educators to consider their own distinctive educative possibilities.

2. Qualitative Research

Since the overall goal of the research is to investigate how educators use and share Google to develop 21ˢᵗ century skills, it is important to approach the research questions within a qualitative framework. Qualitative research, among other things, looks at relationships between variables and can demonstrate the cause and effect in controlled situations. It often assumes the sample is representative of the population, and it can be a more reliable and objective means of exploration than quantitative research. As stated by Madrigal and McClain (2012), "Qualitative research provides valuable data for use in the design of a product—including data about user needs, behavior patterns, and use cases" (1). As we can recognize universities as a business as well as an educational institution, Japanese HE students can certainly be called "customers" since they pay tuition. Therefore, how HE teachers design, implement, assess, and disseminate their lessons is best examined under this framework.

3. Data Collection

This study focuses on the data collected from five HE teachers in Japan. All of the respondents are foreign academics working in Japanese HE in the humanities. They are teaching both content and integrated English courses. This small sample size was selected for two reasons. The first reason is that this research is exploratory in nature and meant as an investigation of the technology that is available at the current moment. The second reason was that I was actually able to have easy access to these specific individuals. A description of the respondents (A-E) can be seen in Table 4. Each participant responded to a questionnaire that was mailed to them, and then participated in an informal interview to gain more detail about their replies. Their responses were transcribed and coded. Though the sample size is small, it is a good indicator of the ways in which educators utilize Google to promote the development of 21ˢᵗ century skills, and where future research should be directed.

Table 4: Cases

Interviewee	Institution	Class(es)	Student Level	Years using Google in the Classroom	Google Expertise
A	Private	Writing, Presentation	Advanced	5	Fundamentals Course
B	Private	Presentation	Intermediate	7	Advanced Courses
C	Private	Writing, Reading	Elementary and Intermediate	2	Proficient
D	Private	Speaking, Listening	Lower Intermediate	4	Fundamentals Course
E	Private	Integrated 4 Skills Course	Intermediate	4	Proficient

In order to better explain the specific teaching contexts and levels of expertise, each participant indicated which class or classes he or she were referring to when utilizing Google to develop these skills. Respondents indicated their students' levels based on their university's level system. Each of these schools uses either TOEIC or TOEIC Bridge to place their students. Each participant also specified the number of years they have been using Google in the classroom, as well as how much Google training or certification they have covered. It should be noted that only one of the participants in this study has completed any specific Google certification. Participant B has become a certified Google Educator Level 1, but the other two listed under the Fundamentals Course have only completed a certain number of courses in the series, and have not yet obtained certification. The remaining two educators stated their level of Google expertise to be "proficient" enough to function in the classroom, indicating that they have simply been using Google for a number of years so that without any formal training they still have sufficient knowledge to utilize Google while in class.

4. Coding

Starting off with an exploratory analysis, a range of categories and current themes were detected from the interview data. A second order analysis was then conducted in order to search the data and answer the research questions, as well as a rough narrative analysis. The first step was to develop themes from the research, which focused on technology in the classroom and 21st century skills. The second step was to explore the data and assign both codes, and to some extent, code descriptions to the data. The list that follows are the most commonly communicated themes in

descending order. The themes were identified by the number of times a feature or task was mentioned like collaboration or sharing ideas, and how it relates directly to the development of 21st century skills.

Table 5: Codes directly obtained from the data as well as Trilling and Fadel's (2009) model of 21st century skills

	Code	Descriptive Device
Themes	Collaboration	Sharing, assessing Real-time, two-way
	Communication	Real-time, two-way Oral, written, visual, vocal, cultural, and global
	Search and Find	Research, motivation, responsibility, and autonomy
	Organization of Data and Creation of Content	Skills development, productivity, time-management, independence, and innovation
21st Century Skills	Learning and Innovation Skills	Critical thinking Problem solving Innovation
	Digital Literacy Skills	Information & media literacy
	Career and Life Skills	Flexibility and adaptability Initiative and self-direction Social and cross-cultural interaction Productivity and accountability Leadership and responsibility

The results section will attempt to clarify the outcomes of the interviews by combining the elements of 21st century skills and the data. It should be noted that since 21st century skills are not separate and distinct, but rather overlap and are supportive, the data is presented in what the researcher found to be the most salient features of Google resources, as well as the most prominent themes discovered in the analysis. Each category combines a number of different skills and can be used to develop those sought after by both academia and professionals.

IV. Results

1. Collaboration

Through applications like Docs, Sheets, and Slides, both students and teachers can work on presentations, documents, and data projects in a live collaborative environment in the 24/7 classroom.

"The way that Google Apps are interactive and easy to share is amazing. My students can actually share their work in real-time with other students while sitting at home" (interviewee

A).

Google applications can be downloaded onto smart phones for easy access anytime, anywhere. Students and teachers can download content to work on offline if the Internet is not available, or work online anywhere there is an Internet source, and on any device that supports the applications. Google Drive additionally allows teachers to share work that all students can access and collaborate on at the same time. Of course, they can do this on an individual basis as well.

"Students can see their classmates because they are named at the top of the document and there's a little colored flag. They can watch their classmates add content to the document" (interviewee D).

Both students and teachers can then use sharing and commenting functions for collaboration and immediate feedback, as well as the chat function in which a chat box pops up on the display, allowing students to live chat with any of their collaborators, including the teacher. This can provide students not only with immediate observations and critiques, but also creates two-way communication with their fellow classmates and the teacher. "Once a student has resolved an issue addressed in a comment, they can erase it. I think this helps students have a stronger sense of achievement" (interviewee E). Essentially this means that students can see their work adapting as they go, and they can see the process. Teachers and peers can add comments to the side of a document or directly in the document itself. "Students like the fact they can talk about their projects while they are working through them" (interviewee B). Moreover, students and teachers can engage in a group or one-on-one with Google Hangouts, for video or text discussions. "I've been using hangouts as office hours. Some of my students continue talking to each other, even after I have left the group" (interviewee E).

Opportunities to collaborate are provided by every application that comes standard with Drive: Docs, Sheets, and Slides. By sharing content within these applications, each member can add ideas and resources — and see everyone's changes in real time. For example, group presentations can illustrate the collaborative nature of Slides.

"I create a slide show and assign one slide to each student. Students have permission to edit, so they can add content to their slide. Then we play the slide show in class. It's student work instantly on display" (interviewee B).

Additionally, students can suggest changes, make adjustments, and work together with their classmates without having to worry about scheduling time to meet after classes, something that can be difficult for busy university students. "My students love the fact that they can work together on projects without actually meeting their classmates" (interviewee B).

Another way that Google can be collaborative is through the use of Sheets. Sheets can be used to conduct in-class surveys about class content. "I assign each student a row in Sheets and ask them

to type in their answers. It's immediate feedback on what they know" (interviewee A). Moderator can be used for students to post ideas and talk about them. They can list sites, articles, and ideas for collaborative projects. Furthermore, any student can ask questions, and with the social ratings feature, students can vote on the most popular questions, focusing attention on what students want answered. "Moderator is great for backchannel chat. While my students are watching a video they can post comments or questions related to the content" (interviewee A). Google Drawings can be created and shared with students. If displayed to the class you can create a type of "interactive whiteboard." "We often use Drawings to brainstorm topics" (interviewee B).

Google offers a variety of resources for student collaboration, and they can do this in class, at home, or basically anywhere there is an Internet connection. They can collaborate, and negotiate about the content they are working on with both their teachers and their peers. Furthermore, they are exploring, utilizing and adapting to the technology as they go, in addition to employing and developing a number of 21st century skills.

2. Communication

Google allows students and teachers to communicate across a variety of mediums. These resources give students the chance to explore and apply fundamental forms of communication, and to develop the skills that they need for their future and immediate success. Google works for both integrated and content courses and helps students to build fluency through vocabulary and phrase repetition. "There are so many ways Google can help students to develop their communication skills" (interviewee A). The ability to communicate effectively is "consistently found in the top skills required of new employees" (interviewee A). Communication can be oral; or it can be written, either in print or digital formats; it can be visual, like a map or video; or it can even be non-verbal, through gestures, body language and the tone and pitch of our voices. Regardless of a student's level, "improvement can be made from developing their communications skills" (interviewee A). For instance, students traditionally use blogs to write down and share ideas. However, Blogger offers many other ways students can share content, as anything with an embed code can be uploaded onto the blog.

"My lower level students can tackle blogs by not only trying to add the language they know and the language of the lesson, but adding visually rich resources, like personal photos or videos. I wish I could use Google in my other classes" (interviewee C).

Students can also work with mediums they are familiar with and reflect on their own digital literacy, like SNS. "Once students start communicating with other students overseas, Google Hangouts or Plus replaces Line as the means of communication" (interviewee A). SNS have been prevalent in the way many students today communicate and share information, and thus, are a good

way to ensure they are equipped to interface with a socially networked society. Google's Mystery Hangouts, a feature of Google's video chat service, is one example. In Japanese education, and specifically HE in Japan, "the phrases 'internationalization' and 'global citizens' are becoming increasingly more important as Japanese universities compete for a limited amount of students" (interviewee E). Google products embrace these themes in order to communicate, research, share, explore and identify with becoming more "international" or "global".

> We've used Mystery Hangouts in our school with a class in Australia. It's ideal because they're only two hours ahead of us. It was a little hard to set up, but I think it was a fun and authentic experience for my students" (interviewee E).

Teachers can also use these resources to have guest speakers talk via Google Hangouts. If the budget does not allow for a guest researcher or lecturer to come to your school, "have a guest lecturer give a talk in Hangouts" (interviewee E). Interviewee E recently met an individual who worked for Google through a mutual friend. He asked the Google employee if she would come give a talk to his class, but due to the day and time of the class it was difficult for the Google employee to come to the campus. However, she was able to address the class through Google Hangouts remotely. Thus, Hangouts can provide students with the opportunity to communicate with a number of different educators in addition to their teacher. Furthermore, like most SNS, students can join groups and communities to find out information about specific topics or to communicate with people who share common interests. "This is a great resource for students to communicate with others, or find out information about a topic or theme" (interviewee A).

Additionally, Google allows for two-way communication between the teacher and the students. "If I allow my students to edit a Doc or a Slide, they can add comments or questions" (interviewee B). This gives students the ability to clarify, respond to, and comment on content.

> "Sometimes students don't ask questions in class, but now they can add questions or comments directly to the content. Other students might have the same question, so this can be helpful for everyone" (interviewee B).

3. Search and Find

Google can support student autonomy by offering several resources and tools to help students find the answers they need. When asking students to present on a country, city, area, or location, Google Earth can provide a visual context for the lesson. "Google Earth is a good way to create visual tours" (interviewee B). Furthermore, when students need to find information there are several ways they can become more independent with Google. "Android users can use Google Goggles to visually search for objects they're unfamiliar with, like a certain kind of mushroom (iPhone users can use the CanFind app)" (interviewee D). Moreover, many teachers have been

frustrated by their students' lack of innovation or critical thinking when it comes to finding answers on their own.

> "Sometimes student's lack of resourcefulness is frustrating, but when I show them different ways to search, like using Google Images, they become more motivated. I'm so used to the resources I sometimes forget my students may not even be aware of them" (interviewee C).

"Google Alerts" (Interviewee A, B & E), allows students to store and share summaries of news and information. Students can set an alert that notifies them whenever a keyword item is found. This can help students to monitor the web for the content they are searching for. "Google Books is useful for looking at literature and they have graded material, which are easier for my students to understand" (interviewee C). "We use Google News in our class. It's a good way to look at current events" (interviewee E). If students are to develop critical thinking and problem solving skills, they need to know how to access information. Students can find the information that they need by exploring content created by other users in Slides, Forms, Sheets, Docs, and YouTube. "My students sometimes use VideoSparkNotes on YouTube to help them understand the content" (interviewee E). Of course, Google is most famous for its search engine, but instead of students simply searching for something, like a citation, get them to utilize the resources to become familiar with the topic. "I get my students to look at a variety of resources to develop an understanding of the topic. We use videos, articles, and have group discussions, all before my students begin to write" (interviewee E). Educators can embed videos and Docs in Blogger, store it all on Drive, and talk about the content with Hangouts. Every facet of the lesson and the quest for information can be facilitated through Google.

4. Organize data and create content

With students becoming more proficient in digital literacy, "they need to know how to access and organize data" (interviewee E). Google Drive, a file management and cloud storage system, assists students and teachers in organizing, creating, and collaborating. Files stored in the cloud can be accessed from anywhere. "I like that both me and my students can access and edit documents on the train" (interviewee D). If you download the apps on your mobile device, you can have instant access to viewing and editing. Furthermore, Drive makes it easy to view, share, and organize content. "Students can send just about any medium through Drive, and I have instant access to it" (interviewee D). Students can learn not only how to store data, but also how to organize and retrieve it.

> "Since my students use Google tools in multiple classes, they need to keep their files arranged so that their data is easier to find. This forces them to be responsible for how they organize their files" (interviewee A).

Additionally, there are specific tools to help students stay organized like Google Calendar. Google Calendar can be embedded into the class website or blog. Lesson plans can be added and students can set up reminders on their devices to receive notifications about important dates and events. Furthermore, students can use Calendar to share schedules and information. Setting assignment deadlines, tasks, and meeting times are just a few of the ways in which students can utilize Calendar to help them stay organized and on task. "We use Google Calendar in our class blog to remind students of due dates and to schedule meeting times. This is especially important for first year students" (interviewee A).

Google Photos is another good resource for organizing data. Photos allow users to modify, arrange, and create, as well as share digital photos. "Students in my presentation class use Photos to create collages, and movie slideshows" (interviewee A). Students can create slideshows with music and subtitles and upload them directly to YouTube. Additionally, students can use Google Forms to create surveys and questionnaires, and to collect information. They can display this data in a variety of different formats, such as graphs or charts. "We use Google forms to collect specific information and then share that information on Sheets" (interviewee E). "We use Google Forms in our writing class to create questionnaires on a variety of topics" (interviewee A).

Here are some examples of successful task-based learning projects that the interviewees have used in their classrooms, using many of the above mentioned applications to manage time, develop critical thinking, creativity, collaboration and communication skills: *stop motion animations, public service announcements, slide presentations, video introductions, storyboards, short stories, academic writing projects, speaking and listening opportunities, like interviews and podcasts, and language games, like Jeopardy and trivia quizzes.* These task-based projects and their accompanying applications can also be viewed in the following table:

Table 6: Task-based projects and Google products

Task-Based Learning Project	Google Product	Function
Stop Motion Animation Projects and Public Service Announcements	Docs, Gmail, and Hangouts Drawing, Images or Slides Slides and YouTube	Brainstorm and collaborate on ideas in real-time Illustrate storyboards Collect and play videos
Visual Presentations, including pecha-kucha, research, and self-introductions	Slides Images, Drive or Drawing Docs, Gmail, and Hangouts	Collaborate with peers, work in real-time, and to communicate with the teacher Collect visual input Brainstorm and collaborate on ideas
Video Introductions	YouTube Slides Drive	Upload and publish content Share with teachers and classmates Access content
Academic Writing Projects	Docs Calendar Alerts	Brainstorm and collaborate with peers and the teacher Ask questions and make comments about the content or specifics about the assignment Peer-review assignments Manage time and writing goals or tasks Notify of upcoming due dates
Interviews	Docs Slides YouTube	Share and collaborate on content Create transcripts and word/phrase lists from the content Upload the content whether oral or visual for sharing Publish visual content
Jeopardy	Slides Search, Drive and Drawing YouTube	Create, collaborate, and share Find or create visual content Find or create video or audio content

V. Discussion

By exploring and analyzing the number of ways in which students are communicating and collaborating with each other and with their teachers, it would appear that Google is helping to increase student engagement and autonomy. Students seem to have more access to two-way communication, allowing them to question, comment, and express their opinions. They are able to be part of the process from beginning to end, and can solicit help when and if they need it. As most of these students are living with technology in their every day lives, providing them with opportunities

to utilize these resources in the classroom enables them to develop 21st century skills, as they are not only engaged in the process but in the outcomes and consequences as well.

This research shows that Google is also providing opportunities for access to the target culture. These teachers are asking their students to conduct searches in English, look at content in English, communicate with overseas students in English, and join or utilize groups in English. All of these activities within the target culture could help to develop context and, therefore, make the language learning experiences more authentic. Though there are other resources available, Google seems particularly adept at supplying experiences that Japanese HE students may not have access to normally. Current events, social media, and online discussions are just some of the ways in which these teachers create meaningful language learning opportunities that can contribute to their students' development. Additionally, utilizing Google and its resources in and out of the classroom, can serve to equip students with the technological skills necessary to participate in society both today and potentially in the future. Furthermore, many students are taking these skills and transferring them to real life situations. Once students are introduced to Google and Google products, they can then use these products for their own productivity and interests. The fact that the platform offers easy access makes it all the more appealing and possibly genuine, as students and teachers can use the resources outside of the classroom. Teachers indicated that students use Google+ to stay in touch with friends and groups that share their interests, and Google Calendar to help manage their schedules and time. Moreover, the skills needed to access, create, communicate and collaborate with these resources and technology are essential tools for the future. The very fact that these students are using these resources could provide an advantage in dealing with upcoming technology, as they are already familiar with the skills, knowledge and intuitions involved.

As many of these schools endorse Google Education, support and resources for educators seem readily available. However, it is apparent that not every teacher can have access to these resources. Interviewee C expressed a desire to be able to use Google in his other classes because he felt that it is a good resource for his lower-level students. However, there were not enough CALL or computer rooms available for everyone at his school. Moreover, a few of the participants admitted that computer and CALL rooms were "highly coveted" and were not easy to book. Interviewee E stated that for her integrated course, she was only allowed a CALL room once a week for her twice weekly class, and that she did not have access to the computer rooms for her writing classes this year because her school operates on a lottery type system. Though it has been said that technology in the classroom can be difficult due to the amount of time it might take a teacher to become familiar with the software and skills involved, as stated by two of the participants, this is not the case with Google. Simply using the products can enable one to become familiar enough to utilize the resource in the classroom without any formal type of training. Availability of hardware then

becomes the issue, but could be used as an argument in itself to get Japanese HE institutions, or possibly earlier at the senior or junior high school level, to invest in these resources in order to help their students and clients prepare for a future that requires these types of skills.

VI. Limitations and Future Possibilities

Although this study focuses on technology that is constantly evolving and changing, the purpose is to look at the ways in which educators are using Google at this moment in time to develop students' 21st century skills. The fact that technology is continually being updated and at times being replaced can make this research obsolete. Moreover, the study focused on English education in Japan, and the participants in the study happened to be foreign academics in Japanese HE, specifically in the humanities. It would be useful to examine how Japanese instructors utilize Google in their English classrooms and across multiple disciplines.

Furthermore, it was mentioned in the discussion section that one interviewee was happy that using Calendar helped his first year students manage their time. If we are focusing on 21st century skills, we should have a better understanding of how these skills are taught throughout a student's four years, focusing on continuity. Seniors should already be aware of due dates and time management, but possibly this is something that should be specifically taught and developed for first year students. Educators need to think about these professional skills and how we can help students better understand, develop and employ these skills. Therefore, it is a good idea for further research to look into the ways in which educators approach the teaching and learning of these skills to culminate in a complete four-year curriculum that has the potential to develop these skills gradually. This requires curriculum design and collaboration on the part of educators along with a close examination of what current professional skills are required for success in the workforce.

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