# Micronesian Educator

## A Journal of Research & Practice on Education in Guam and Micronesia

*Photograph by Carim Yanoria*

**Nåna** *by Kisha Borja-Quichocho*

Like the tåsa and haligi of the ancient Chamoru latte stone

so, too, does your body             maintain the shape

of the healthy             Chamoru woman.

With those             full-figured hips

features     delivered

through natural birth for generations

and with those powerful arms

reaching for the past     calling on our mañaina

you have remained strong       throughout the years

continuously inspire me            to live my culture

allow me to grow into a young     Chamoru woman myself.

Through you            I have witnessed the persistence

and endurance of my ancestors     who never failed in constructing a latte.

I gima` taotao mo`na           the house of the ancient people.

Hågu i acho` latte-ku.           You are my latte stone.

The latte stone (acho` latte) was once the foundation of Chamoru homes in the Mariana Islands. It was carved out of limestone or basalt and varied in size, measuring between three and sixteen feet in height. It contained two parts, the tasa (a cup-like shape, the top portion of the latte) and the haligi (the bottom pillar) and were organized into two rows, with three to seven latte stones per row. Today, several latte stones still stand, and there are also many remnants of them throughout the Marianas. Though Chamorus no longer use latte stones as the foundations of their homes, the latte symbolize the strength of the Chamorus and their culture as well as their resiliency in times of change.

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# Contents

# GUEST EDITOR'S INTRODUCTION

**Guest Editor's Introduction**

Digital technology has become a part of a college student's daily life. Students interact with this technology on a continuous basis, from digital alarm clocks to microwave ovens, from cell phones to touch key pads at dormitory and apartment building entrances, and from digital watches to digital cameras to digital phones. As the price of technology continues to drop, computers and other digital devices have become integral parts of college classrooms and curricula. The digital technologies of today bring the tools of empowerment into the hands and minds of those who can demonstrate some facility with them. Graduates of education programs are no exception. Pre-service teachers exit their training programs and graduate from colleges with the expectation that they will be hired by school districts and boards of education that are impressed with their skills in their content areas, e.g., math, science, social studies, language arts, etc. During the last decade, pre-service teachers have needed to become competent as well in the use of digital technology (Cyrus, 2006).

Given the great advances and innovation in educational technology allowing for greater student engagement, access to superior academic resources, and allowing for a wider range of creative projects, digital and instructional technology is the theme of this edition of the Micronesian Educator. We look at the broad spectrum of instructional technology uses, from novice introductions to software and hardware, to advice about adoptions of specific tools, an onward to expert opinions about the use of specific hardware.

When the discussion turns to instructional technology within the educational environment, the conversation generally heads in one of two directions: the unanimity of tech savvy students versus teachers or the inclusion versus exclusion of certain technology devices within the curriculum. Our contributors, in both large and small educational environments, share some of their seemingly intrepid forays into the realm of introducing technology into their own curricula activities resulting in interesting discussions and suggestions.

Many pre-service teachers have, indeed, learned the basics of computer technology in previous high school classes or in college courses, some of which are pre-requisites for graduation. It is common in undergraduate and graduate courses for instructors to require that term papers and projects be submitted via a text-processing program. Instructors often use presentation software (or handouts from these files) to present lesson objectives and activities. Yet, digital technology, if it is integrated into the curriculum, revolutionizes the learning process and increases their awareness and "which areas of knowledge they integrate into their curricula, what the goal of this knowledge is and which strategies are best suited to help pre-service teachers acquire this knowledge" (Instelfjord & Munthe, 2015). More and more studies show that technology integration in the curriculum improves students' learning processes and outcomes. When pre-service teachers were introduced to computers as problem-solving tools, it changed the way they perceived teaching (Cyrus, 2008).

**Sections**

The reading audience for this Instructional Technology (or Information Communications Technology — ICT) edition of *Micronesian Educator* includes both pre-service and in-service teachers, and academicians of all content areas, as well as researchers and administrators. As you will discern from the

breadth of approaches to IT that our contributors span, digital technology touches our educational environments in a myriad of ways. Given that approach, this IT edition will be divided into 3 succinct areas for examination and discussions: perspective reports, action research (graduate student research), and academic research.

**Perspectives, Reports and Commentary**

The authors included in this section are as follows:

| | |
|---|---|
| Thompson, Ian | Instructional Technology and Multi-media as Change for Teaching and Learning Opportunities in Micronesia and Wider Oceania: The Use of Multi-Media OERs in Pacific Primary and Secondary Education |
| Baird, Pauline | From the Caribbean to Pacific: A Writing Teacher's Odyssey with Technology |
| Rubenstein, Donald | Photographing FestPac: Confessions of a Self-taught Shutterbug |
| Olah, Dean | An Introduction to Chromebooks for Education |
| Trillo, Maria | Technology in A Rural School |
| Harvey, Anne Marie | Engaging Adolescents with the New Digital Literacies |
| C. S. Schreiner | Minority Report on the Role of Critique in Technically Fortified Learning Culture |

Perspective pieces, reports and commentary included in this section are scholarly reviews of fundamental concepts or prevalent ideas in IT. They present the author's viewpoint on the interpretation, analysis, or methods used in a particular study, such as Dr. Pauline Baird's sojourn of technology proficiency. These are essays that present a personal point of view critiquing widespread notions pertaining to the IT field, from Dr. Donald Rubinstein's self-taught proficiency as a shutterbug, to Dr. Ian Thompson's digital travels in the Pacific islands or Dr. Maria Trillo's digital road to technology in a rural school. An opinion piece can be a review of a single concept, such as Dr. Dean Olah's introductory overview of Chromebooks for educators or a few related concepts such as Dr. Anne Marie Harvey's journey into the new digital literacies. A refreshing and differing viewpoint is presented by Professor Schreiner who highlights in a strong, well - written essay how the use of ICT must be balanced with critique and the use of reading and writing both of which should be nurtured deliberately given the over indulgence in digital technology today in campuses, homes and in workplaces. Dr. Schreiner reminds us that ICT is a tool, not master, to all our needs in and for learning, work and life.

**Action Research**

The authors included in this section are as follows:

| | |
|---|---|
| Techaira, Doris | The Effect of Multimedia-Based Instruction in Increasing ESL Students Test Scores in Eighth Grade Language Arts |

Miwa, Ai                         Increasing Student Achievement Through the Use of Technology in Art:
                                 An Action Research Study Done on Guam

Baza, Katrina                    The Results of Interactive Whiteboard Technology Usage on Oral
                                 Reading Rates for Second and Third Grade English Language Learners

The definition of action research used for this publication is the disciplined process of inquiry conducted *by* and *for* those taking the action, in this case graduate students who were also in-service teachers. The primary reason to engage in action research is inevitably to find a positive effect for the learners involved as with the multimedia-based instruction research with eighth graders conducted by Ms. Doris Techaira, the interactive whiteboard usage with second and third graders by Ms. Katrina Baza, and the technology use in art by Ms. Ai Miwa.

**Academic Research**

The authors included in this section are as follows:

Miller & James                  Survey and Analysis of Online Learning Experiences and Expectations
                                 Among University of Guam Teacher Candidates

Doman, Evelyn                    Technological Empowerment: A Case Study of the Flipped Classroom

Brandstetter & Maushak   Teachers' Perception of the Role of a Technology Integration Coach:
                                 an Ethnographic Case Study

Lo, Chiu, & Ho                   Japanese Undergraduate Students' English Communication Problems
                                 and Learning Motivation Outside Formal Classroom Environment

In this third section, academic research and investigative writing based upon the idea of scientific inquiry focuses on the creation of new ideas, perspectives, and arguments. Within this journal edition, the focus includes instructional technology. Technology, of course, is involved in both the curriculum of our schools and the administration. This edition of *Micronesian Educator* accesses perspectives from academicians with backgrounds and teaching experiences span beyond the Pacific Islands, such as the research team of Dr. Jackie Brandstetter and Dr. Nancy Maushak, and the research team of Dr. Patrick Lo, Dr. Dickson Chiu, and Dr. Kevin Ho, but whose IT perspectives and experiences have some common grounds as in the survey and analysis of the research team of Dr. Mary Jane Miller and Dr. Geri James. In her article, Dr. Evelyn Doman looks at technology empowerment.

We explore those commonalities via three forays into the ever-changing world of instructional technology: perspectives and commentaries, action research, and academic research.

We bookend our eclectic edition of *Micronesian Educator* with two very different experiences involving the use of technology from the prospective of a seasoned, tenured professor, Dr. Donald Rubinstein and of a newly minted assistant professor, Dr. Pauline Baird.

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# PERSPECTIVES, REPORTS, AND COMMENTARY
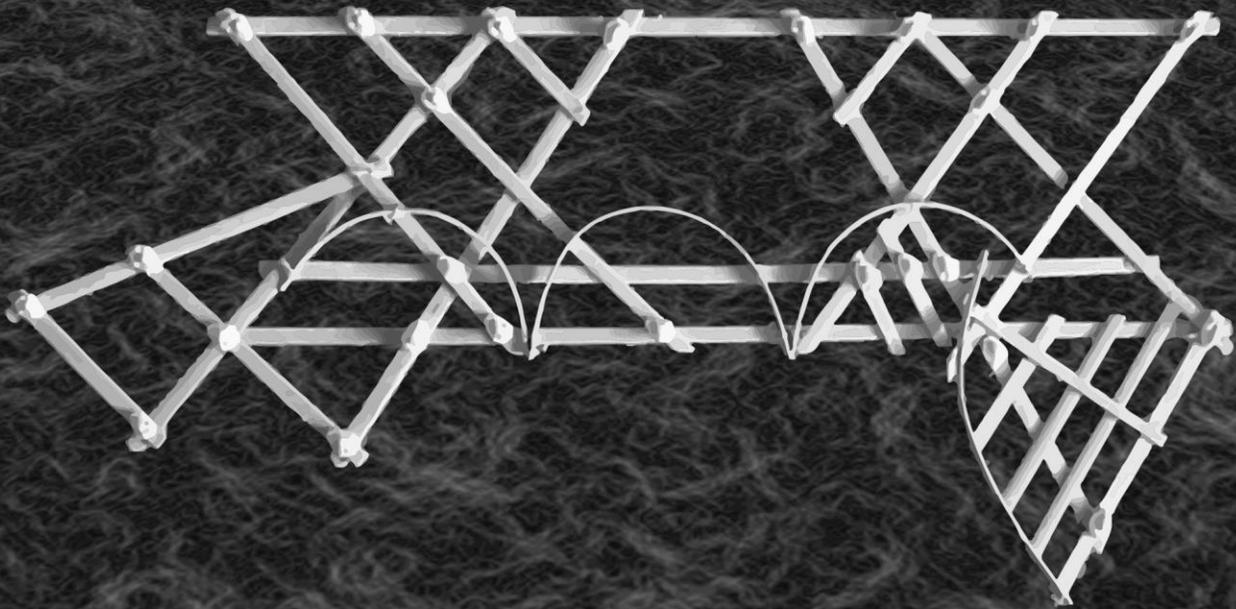
# Instructional Technology and Multi-Media as Change for Teaching and Learning Opportunities in Micronesia and Wider Oceania: The Use of Multi-Media OERs in Pacific Primary and Secondary Education

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**Introduction**

OERs (open education resources) are a rapidly growing part of education, creating opportunities only dreamed about 5 years ago. OERs range from simple lesson plans to a full curriculum, from teacher's notes to teaching videos, from encyclopedias to the latest research reports and from syllabus notes to full courseware. And all free. Often, the resources are provided for teachers, but more and more are being developed for students as well.

A relatively recent OER development has been the packaging of combinations of these teaching and learning resources targeted at developing region's schools. Combining this resource with recent technology developments such as microcomputers and Wi-Fi hot spots allows the delivery of powerful packages of OERs in an "offline mode" to rural and remote schools in developing countries at very low costs. This paper will explore such developments in Pacific Education.

**OERs**

The OER "movement" has been growing steadily in the last fifteen years and the number of open resources is growing rapidly and covering many areas of education. Although it is fair to say that the majority of OERs have been developed for tertiary education, there is a growing range of "OERs" that are developed for Primary and Secondary schools. Examples would include the Khan Academy videos, Wikipedia for schools, the Hesperian Health Guides and TED talks, to name a few of the more well-known ones, but there are a growing number of Pacific resources as well, including the Micronesian Seminar videos, Pacific Climate Change and  health content for schools. Many countries are encouraging teachers and students to explore ways to use such resources to foster the development of new student-centered teaching and learning and the development of the so-called 21st Century skills. This is now beginning to happen in Pacific schools.

Perhaps these resources are best described as Open Teaching and Learning Aids as often they are not formally licensed as Open Education Resources (e.g. through the Creative Commons licenses), but blanket approval for free use and distribution is given. This segment of OERs is not often referenced in OER papers and research, but they are playing an increasing role in developing country education systems, particularly in "offline" solutions where the Internet is not available or is too expensive for schools. The appeal of "cheaply" providing a rich source of teaching and learning resources is very strong.

Perhaps a good example is the Khan on a Stick[1] with three thousand teaching videos packaged to be downloaded onto a USB drive which then can be accessed by any computer with an Internet browser. Topics covered include mathematics, science and health. In mathematics, for example, the videos start at one plus one (basic counting) and go all the way to senior secondary calculus and algebra. As mentioned at the web site:-

It fits into a 16 GB flash memory USB card, which when plugged into a Windows computer or laptop will let you not just play the Khan Academy content on it, but also, if connected to a local network (like in a school or community center), wired or wirelessly, use the same computer to act as a web server, serving the Khan Academy content to any other computer or device on the same network.

There is nothing to install at all in the PC or laptop. Everything runs from the external memory stick, which includes a web server and other tools.

The World Possible[2] Rachel package uses the Khan on a stick package as a base, but adds many more resources.

The by-line from the Rachel web site is:

Providing the world's best education content for those without the Internet

Other resources in the Rachel package include Schools Wikipedia, health and agriculture resources, thousands of free books and much more.

**Offline solutions**

Other innovators are now taking the Rachel package and re-packaging it with other free ICT (information, communication and technology) tools that make it easy to have offline chat groups and blogs and to create and add local resources. Perhaps the best example is the Commonwealth of Learning approach called APTUS[3] (see Appendix A).

Other innovative approaches used in the Pacific include solar panels that charge the system, e.g. the Solar Powered E Learning Library (SPELL)[4] and a packaged set of robust tablets in plastic "suitcases" for transporting from classroom to classroom, e.g. Kio Kit[5] (see Appendix E).

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[1] http://khan.mujica.org/
[2] http://worldpossible.org/
[3] https://www.col.org/services/knowledge-management/aptus
[4] http://solarspell.org/
[5] http://education.brck.com/kiokit/

These solutions give an Internet-like experience (i.e. you access the content through an Internet browser and can search for and interact with the resources just as you do on the Internet) but it is not connected to the Internet. This offers some advantages for those concerned about cyber safety and security, especially while learning how to use ICTs. They also offer great opportunity to deliver digital versions of local text books and other curriculum and teacher professional development resources.

With APTUS costing US $100 and tablets now getting down to US $50, such approaches are becoming very affordable (and there are no Internet costs). For example, the Kio Kit, including the plastic carrying case, the microcomputer and Wi-Fi hot spot and 40 tablets costs US $5,000.

Much has been made of the use of such resources in developed country schools (but usually using the Internet) enabling more student-centered and flexible learning approaches, but before we get too excited about the technology, perhaps we should consider the education landscapes and key differences between a developed education system where these initiatives come from and typical Pacific education systems.

Typically, developed country education systems have

- Good management and professional development systems in place
- Well trained teachers and principals
- Good teaching and learning resources (most often in the "mother tongue" of students)
- "Affordable" ICT solutions, with good technical support
- ICT literate populations

In general, the resources we are talking about are just one of many to choose from.

In comparison, Pacific Education suffers from

- Cumbersome management systems, often paper based and filled with inaccurate and old data
- Many under-trained teachers and school leaders with few opportunities for professional development
- Very few text books and libraries of old donated English books with little relevance to the curriculum
- Expensive/unaffordable access to ICT equipment and Internet with virtually no technical support
- A very basic understanding of ICTs in the village

Clearly, with such wide differences in education between the developed and Pacific education systems, the Pacific needs to develop its own approaches to using such solutions.

This conclusion is clearly supported by the "failure" of so many ICT initiatives in the region that copied "best practice ICTs" from a developed education system

As a side note, the only real failure is a failure to learn from failure and this paper is an attempt to present learnings from ten years of experiments with ICT in Pacific teaching and learning.

Perhaps the best known "failure" is the One Laptop per Child program and its mandated approaches of constructionist learning and child ownership leading to confusion in Pacific classrooms, underutilization and no projects being sustained. Typical of most ICT pilots, the program was under resourced (both regionally and in each country) and clear links to education improvement policies and plans were not made. Very little training /professional development was given and many teachers struggled to see how the laptops could be used to assist the development of the required learning outcomes.  Perhaps the clearest outcome was the development of ICT literacy in students.

So let's see what is happening with these new approaches.

**Deployments of APTUS, Solar Spell and Kio Kits**

In the Pacific Islands, several trials of the above "solutions" are under consideration or just commencing; perhaps the most prolific of these is APTUS. To date 40 have been delivered to the Vanuatu TVET sector (as part of the Cyclone Pam relief). Kiribati is planning 40 for every senior secondary school and Fiji has pre-ordered 400 for rural and remote primary schools to be used in conjunction with the 5,000 tablets donated by the Indian Prime Minister. In each case, education officials are now working to determine what content should be included, especially locally relevant content and how best to introduce them. This process seems to be taking quite a while and no known deployments have yet occurred.

Solar Spell, an initiative from Dr. Laura Hosman as part of a USA University research project, has been delivered to Federated States of Micronesia, Vanuatu and Samoa (and soon Tonga). The model of deployment is interesting as it works through the US Peace Corp volunteers based in rural villages and schools and is directed more at the informal learning system. Currently more than 100 units have been deployed.

It may not be possible to compare this approach with those in the formal education sector due to the widely different goals and supporting systems of informal and formal education, but it is important to note the speed of deployment and general level of acceptance of using the OERs.

Kio Kit is perhaps the most recent entry to the Pacific. It is developed in Kenya for rural African schools and seems well suited for the remote Pacific Islands. It is being trailed in five schools in the Solomon Islands through the Ministry of Education, but the standard African content has been adapted to suit the Pacific. This project will have a formal evaluation and a research component and reports will be distributed.

Other initiatives using the Rachel content as a base with added local content for issues like Pacific Climate Change and Pacific Healthy Lives are being trailed in Vanuatu in a program of school-based Community Learning Centers; a similar approach is being developed in Tuvalu primary schools. A local IT businessman is also promoting a Rachel-based package for delivery to interested schools in PNG and many "Rachel on a Stick" USBs have been given to a wide range of education officials and teachers.

**What we are finding**

Typically, most deployments of APTUS/Rachel/Solar Spell fall into the category of pilots or trials with no attempt to integrate the approach into the existing teaching and learning systems. It is unclear just how the resources will be (or are being) used. Largely, it has been up to each teacher to work out how

to use them in the classroom. Usually they receive basic training on how to operate the devices but get little training on how to use the content to improve learning.

Some examples of using the resources are:

1) Teachers use them to help prepare their lessons and improve their own teaching, especially on subjects they are not so confident using.
2) The whole class watches the teaching videos and then engages in classroom discussion. This allows the teacher to spend less time lecturing to the class and more time working with students in problem areas.
3) Students are put into small learning groups and use the resources that are appropriate for their level of learning, hence, introducing the student center learning approach.
4) Students are given a problem to solve and some guidance on how to find resources that will help them. This is often done in small groups and help develop Information Literacy.
5) Sometimes students are given "free time" with the devices to explore, or are encouraged to use the resources for review before exams.

In some countries, education officials are keen to have the children exposed to more English-speaking resources to improve the level of English literacy while others just want the students to learn to use the tablets and laptops and develop their ICT literacy. Generally, most teachers are unsure how to link the resources with the traditional required learning outcomes of the curriculum and are not very confident in using new teaching approaches and pedagogies.

In some cases, the deployments are introduced to address policies that call for a change from teacher-centric teaching to learner-centric learning. They carry the hope that providing appropriate packages of Open Teaching and Learning Aids will provide the tools and resources to facilitate this change, assuming it will lead to better quality of teaching and learning and the use of new pedagogies. It is recognized that education officials and teachers will need training for this, but Professional Development systems are weak or do not exist and early training efforts are rarely followed up.

While important, pilots and trials should lead from scaled up into sustainable deployments, little serious planning is being done on this. Unfortunately, this seems typical of ICT for better education deployments in many developing countries, further providing for professional development for education planners and managers responsible for budgets is clearly required.

Perhaps the final learning as hinted at previously is that there doesn't seem to be good models of using these OERs in Pacific Schools. As mentioned in the SRI research on Khan Math videos (Murphy et al, 2014), teachers in developed education systems seem to choose many different ways to use these resources. The unanswered question is: what works well in Pacific education systems?  It seems that at least, guidelines for the use of the Open Teaching and Learning Aids need to be developed to assist teachers.

By now, it should be clear that focusing on devices and content will not be sufficient to deliver maximum learning outcomes at scale and sustainably.

**Opportunities and Challenges**

Clearly the biggest opportunity is to cost effectively provide a wide range of the best possible multimedia education resources to Pacific schools. This would represent a major breakthrough for Pacific Education.

However, as Mike Trucano from the World Bank says in his EduTech blog on Complexities of Using Free and Digital Learning Resources (World Bank EduTech blog 2015):

How are you actually going to use all of this stuff?

He goes on to say:

As part of the process of answering this question, education systems may want to consider:

1. **Mapping** this body of digital learning resources, both in their entirety and one-by-one, against their existing curricula and curricular objectives;
2. **Sequencing** individual materials in ways that are appropriate and relevant for use by teachers and students;
3. Helping teachers **orchestrate** the use of these materials for learning.

He cites the most frequent response to these questions as "Can't the teachers take care of that?"

The most appropriate answer would seem to be "With some difficulty, after training and at the expense of other duties."

One way to assist in the effective use of such "stuff" is for Ministries of Education to provide clear links to existing policies and education improvement plans. For example, many MOEs have policies for moving from teacher-centric teaching to learner-centric learning. Logic says that teachers with access to few or no teaching resources will inevitably fall back on "talk and chalk" and rote learning approaches. But if they can provide teaching videos that students can view at their own pace (pause, rewind, watch again etc.), teachers can use the time previously spent on delivering the content and move towards helping students in their understanding and applying the information. This is often referred to moving from the "sage on the stage" to the "guide on the side" and these resources show good promise to help in making this change.

Of course, such changes are difficult to make and experience shows that continuous professional development for teachers (and MOE Staff) is essential.

Other challenges include the linking of the OERs to curriculum outcomes. In many of the trials, a key theme emerges around "how do I use the resources to teach the curriculum." Ideally, the Curriculum Development Unit would do this for teachers by including them in the syllabus, but they are generally too busy redeveloping the curriculum and text books to provide such support to teachers.

While important, pilots and trials should lead to scaled up and sustainable deployments, but little research is being conducted to learn how best to do this. Unfortunately, this seems typical of ICT for better education deployments in many developing countries.

**Conclusions**

It is probably too early to draw any conclusions from those Pacific pilots and trials mentioned in this paper, but there are some observations that may help.

Perhaps the most telling observation is that many teachers (in fact nearly everyone that sees the Rachel package) immediately sees the benefit and wants a copy. But, they want to take it home for their children. It is much harder to introduce it into the classroom.

This leads to the next most important observation. We do NOT do enough to support teachers (and education officials) in this major change in teaching. Continuous professional development is essential to help teachers move through the five stages of adopting ICTs for teaching and learning.

Finally, all too often, pilots and trials of these approaches are not part of a larger strategy or program to improve education. When the trial is finished, there is no funding available to sustain activities, let alone scale it up. Inevitably, the activities die off and yet another "failure" is recorded and any lessons learnt are lost. Treating the trial as phase one of a long-term strategy to improve teaching and learning allow lessons learnt to be built into each successive stage.

**Appendices**

The following is a brief introduction to some of the approaches to packaging the Open Teaching and Learning Aids available today.

*A) APTUS*

COL's idea of a "classroom without walls" is called APTUS. We can imagine a situation where a learner in a typically unconnected environment can access a lesson in a Learning Management System (LMS), and complete an assignment, with her/his credentials intact and available to the teacher. Learners can also participate in a socializing process through visiting and commenting on a blog related to the learning materials and courses.

The current version of APTUS can provide access to about 3000 videos of Khan Academy, about 100 000 articles from Simplified Wikipedia in English besides Wikitionary with about three million entries. It can hold thousands of books in PDF or EPub format. It also provides a WordPress installation to allow teachers to add own content. File sharing through OwnCloud, an open source solution, is available.

*B) RACHEL*

RACHEL Offline is a collaborative effort of non-profit organizations to bring the best technology to those groups that need it most.  RACHEL content will always and forever be free.  Content updates will also always and forever be free.  To the best of our ability, instructions and support will always be free, allowing anyone to replicate and build the products we sell here for their own use.

When a RACHEL server is turned on, a RACHEL server emits a wireless signal, just like the one you are likely using to read this website.  This signal however, only provides access to the copies of websites stored directly on the RACHEL device.  Any device with a web browser (a laptop, desktop, tablet, or smartphone) can connect to RACHEL's wireless signal.

There is an ever-growing list of free educational content available at http://dev.worldpossible.org/cgi/rachelmods.pl

*C) INTERNET IN A BOX*

We are building the Internet-in-a-Box - A small, inexpensive device which provides essential Internet resources without any Internet connection. It provides a local copy of a terabyte of the world's free information.

This Open Source project is being developed by volunteers in southern California. We are seeking schools and communities worldwide who would benefit from our work.



*D) SOLAR SPELL*

SolarSPELL is a Solar Powered Educational Learning Library: a digital library over an off-line Wi-Fi hotspot, designed to simulate an online experience. Making use of open education resources and ever-smaller and more efficient technology, SPELL provides an all-in-one, self-powered play-and-play kit, ready to be deployed with absolute minimal training or maintenance required for start-up and continued operation.

This project's goal is to support education in all subject areas and enable the development of Internet-relevant skills, by providing access to books, videos, and other valuable educational content through an offline digital library, including content specifically curated for the Pacific Islands.  This project is an initiative led by Professor Laura Hosman.

The SolarSPELL library (2016 version) consists of:

- Raspberry Pi 3 Microcomputer
- 32 GB SD Card pre-loaded with open-access educational content
- 10W Eco-Worthy Solar Panel

- Voltage Regulator
- 10,000 mAh Rechargeable Rav-Power Battery
- Micro USB Connector Cords

An Online version of the content is provided here: http://pacificschoolserver.org/
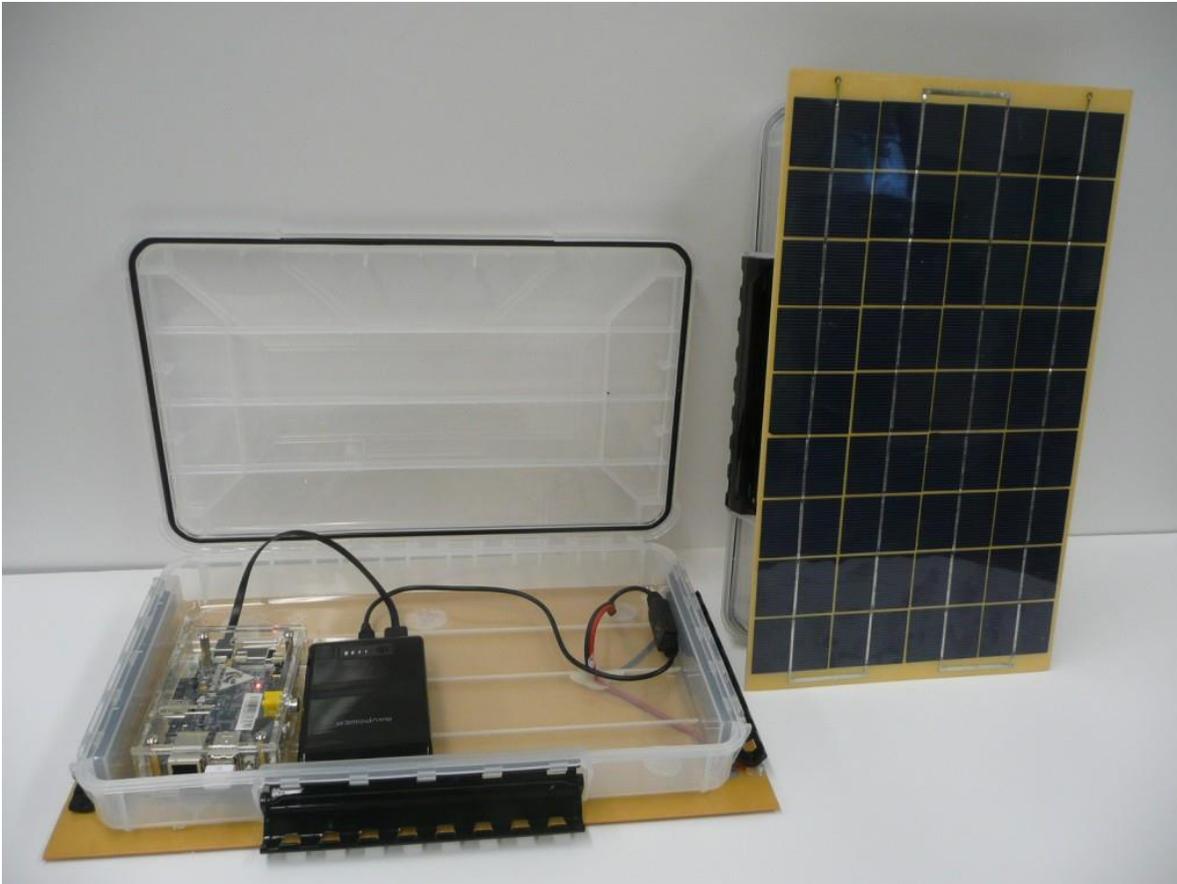


*E) KIO KIT*

The Kio Kit is a simple and elegant solution that can turn any classroom into a Digital Classroom in minutes. It is designed for schools with poor infrastructure.

With a hardened, water resistant, lockable case, the Kio Kit consists of 40 ruggedized Kio tablets, headphones and BRCK micro server containing both world-class and international content. There is a single plug to charge the Kit and one button to power the whole system. The Kio Tablets and BRCK within it have enough battery to manage intermittent power in rural areas.

The Kio Kit comes with a wealth of pre-loaded content from some of the world's leading digital publishers. It includes academic content aligned to local curriculum, games that stimulate critical thinking; and content outside the curriculum focused on responsible citizenship.

Our Wirelessly charged simple and easy to use Kio Tablets are designed to be intuitive for children. They are tough enough to allow for occasional drops and spills with a scratch resistant screen coating and a rugged outer shell to reduce breakage

The first four approaches preload a range of OERs on to a micro server, powered by a battery that runs the system for 6-8 hours. Each includes a Wi-Fi hot spot to gain access to the content. Content can be accessed by any Wi-Fi device with an Internet browser. Typically the system costs between US $100 and $200.

Only the Kio Kit provides a full package, including the access devices. This costs approximately US $5,000 for a self-contained kit with 40 tablets.

All packages sort the content in different ways and have different packages of content and different Open resource tools

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# From the Caribbean to Pacific: A Writing Teachers Odyssey with Technology

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> No action in the present is an action planned with a view of its effect on the future. When the future, bearing its own events, arrives, its ancestry is then traced in a trancelike retrospect, at the end of which, their mouths and eyes wide with their astonishment, the people in a small place reveal themselves to be like children being shown the secrets of a magic trick.
> — Jamaica Kincaid, A Small Place

**Introduction**

This is a story.

While I was teaching writing at the University of Guam, I noticed a student fidgeting in her seat. My request for her to explain her behavior was met with a high-pitched moan and an outstretched hand clasping a cellphone—the wretched cellphone whose use in the classroom I had banned. I asked her to speak. She told me that her friends texting her saying that the entire university was out on the grounds. There was a bomb threat. We were still in the classroom and the last to know.

Up to the time of this incident, I had not engaged the learners in meaningful conversations about the use of digital devices and decisions on how to use them in the classroom community. I must confess that although I had banned active use of the cellphones in my classroom, I did not own a cell phone! In the light of that incident, I have not only reflected on the cellphone policy in my classes, but also my own relationship with technology in the classroom and in civic life to learn how I might negotiate the use of cellphones and new media in the classroom. Whereas, I used to ban the cell/smartphone and any device with social media platforms, I currently embrace and encourage the use of technology as part of my teaching philosophy. I work to include language in my syllabi that encourages learners to take responsibility for the proper functioning of the classroom community, with those devices in attendance. At present, my classroom policies regarding technology are created by learners to facilitate commonsense strategies for technology use in the classroom.  Here, I address ways in which teachers can (re) mediate the use of technology through critical self-reflection on their own technology literacy development (See

Cummins, Brown, & Sawyers 2007).[1] I use critical reflection to make visible my own journey with technology to tease out the ways in which my own experiences influence my teaching philosophy. Such an exercise can provoke discussion on how we teachers learn and teach in the 21st century.[2]

**Conversations: Can the smartphone attend UOG?**

Like it or not, the smartphones attend the University of Guam. It sits on laps and gets tapped under the desk while students wear a mystical look on their faces! In the interest of bringing those devices and all hands on desks, I usually initiate a conversation on responsible use of technology in the classroom.

Scene 1: In a class with adult learners, on the first day of class, I ask learners for feedback on how they relate to their personal devices in their non-school life. I learn that many of the learners were in managerial positions in the social services. Their responsibilities included attending to at-risk individuals in the community. For these learners, the having a means of receiving information was crucial. Other learners need to be available to check in with ailing relatives and the like. Through listening, I reimagine how the role of personal devices as integral in the network that bridges the personal, the academic, and the civil community members. By listening, I discover ways to enter further into conversations and invite learner input. These conversations allow me to construct networks or lines of communication that I would later draw on to facilitate discussions on how our learning environment can be designed to make space for writing in the 21st century. Thus, what started out as a conversation about new media becomes a start of a viable feedback loop for learning. As a result, new media is allowed in all my classes.

Scene 2: With students in first-year writing classes, on the first day, I stand in front of the class and I explain my expectations of the use of new media and invite students to share theirs. Additionally, I ask students to write down, in one sentence, how they relate to their various personal devices. Students discuss and negotiate the use of these devices—to compose with them, take notes, and retrieve information. Each student writes down in one sentence, a personal statement on how he/she plans to show responsibility for the use of technology. I collect and read the statements. If amenable to the teaching-learning community, I agree with the statements. For the duration of the course, I hold learners to their own written standards. Listening and negotiating takes a few minutes and allows teachers and students to work in a civil environment that keeps abreast with the multi-modal or digital turn in the academy and in the world.

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[1] Cummins, J., Brown, K., & Sayers, D. (2007). *Literacy, technology, and diversity: Teaching for success in changing times*. Boston, MA: Pearson.

[2] Since the emergence of digital devices, social media, and texting literacies, learners and teachers have been challenged to adopt new orientations to pedagogy. Hindrances to technology use and literacy development include a lack of skills, access, adequate finances. Admittedly, the use of personal devices in the classroom and in civil life can be disruptive. As William Powers (2010), the author of *Hamlet's Blackberry* learned when he explored his family's need for constant connectivity, the use of technology is not only disruptive, that a technology spa day is needed for users to find balance. For teachers, a ban on tablets, smartphone, other new media without some critical exploration of their use in the classroom, however, speaks to a lack of willingness, among other reasons, to engage learners in critical inquiry of the uses of digital devices in classroom environment.

The conversational methodology helps build classroom communities at the inception so that the learners can experience lower anxieties, show respect for others, and demonstrate a willingness to communicate and learn together. Not that learning and teaching cannot take place without smartphones and new media; I believe that students must draw on *all available means*—rhetorics—of learning and that academia must stay abreast. Acquiring technological literacies is not a spectator sport. Learners must practice using technology, for teaching and learning, and embrace the messiness of it all because messiness is a consequence of learning. That said, not because students have and use personal devices, they know how to convert those literacies for learning in the classroom. Inviting the new media into the classroom is a learning opportunity, for teachers. I say teachers because close examination of our own relationships with technology can teach us how and why we relate to technology.

**My Technology Literacy Development Journey: Transnational Contexts**

The stories I am about to tell are about my technology literacy development. In this space, I reflect on my experiences with selected technologies from 1968 to 2016—childhood through near senior citizen adulthood. Using self-reflection, I share with teachers who are willing but hesitant that through the use of technology I apprehend 1) what technology literacy teaches me about writing 2) how my early writing experiences shape my understanding of methodologies for learning and writing 3) how I situate my technology literacy development discursively.

My technology literacy development takes place in particular transnational communities—the Caribbean, Palau, the United States, Japan, and Guam. I show how access, use, and practice of writing with technology within communities to map relationships among people, land, and practice to challenge the ways learners think of the practice and literacies.

**In Guyana: The Slate, Teacher Julie, and Me**

My literacy development began in a place that saw the wretchedness of slavery and triumph— Buxton Village, in Guyana, South America where I was born and raised. The people of Buxton, the Buxtonians, are mostly of African descent. I, like most, children who attended Friendship Methodist School in the village learned to write from a village school teacher— "Teacher Julie" Younge. She was a portly, motherly, brown-skinned woman who for generations taught children in the first terms in elementary school. In my earliest memory, I liked going to school. Linked to this memory is Teacher Julie. I learned to write from under her bosom, so to speak. She used to put her right arm around my shoulder, tuck me her armpit, place her big fingers on my little index finger and thumb that held the slate pencil, guiding them over the surface of the slate to write the alphabet—a, b, c, and eventually my name.

**Othermother [ing] and Body Mapping**

My earliest memories of writing allow me to make visible how I connect my initial writing pedagogy and literacies to relationships I make among technology, practice, and body. Because of Teacher Julie's involvement in the practice of my writing with the slate, I connect the physical body to a theory of expertizing in writing: it is in practice with others learners to become literate. Connecting body-to-body in the process of being schooled to read and write speaks to the role of "othermother [ing]" in the learning of village children of African traditions (Disch 2004). What this means is that writing with the slate with knowledgeable others has become the basis for a cultural orientation towards writing. Writing learned

from and with knowledgeable others, like Teacher Julie, in the village with and from the body, is a way of knowing that lasts long after writing skills have been acquired.

My literacy development maps technology to learning with a Teacher Julie. I demonstrate how I walk through my stories. My first memories of writing with a slate and slate pencil in elementary school, like most pupils harks back to the education system under the British in Guyana (formerly British Guiana). Under the British, we did not use paper to write at Preparatory A and Preparatory B — the earliest levels of classroom education. We used the slated and slate pencil back in the 1960s and before. The slate and slate pencil might be considered "low technology" in the multimodal and multimedia age where tablets (with stylus) and smartphones are common writing devices.

Using the technology that is the slate speaks to the level of care, demand on the mind, and the body of young children. These demands magnify the setting of methodologies for learning by patterns forged in the young in the village settings and wider colonial system. Using the slate required the users, by the age 6 years and 9 months, when they entered elementary school to carefully not break the slate and get injured. It also speaks to its demands on students' memory. Memorizing became a way of archiving lessons and the promoting rote learning due to the temporal nature of writing on a slate. Written work could easily be erased, and retrieved or saved. Erasure is only one experience, among many, that informs the African experience under colonialism and settler systems of education.

Children in British colonies such as Guyana were educated with Victorian tools such as the slate that stayed in the system long after they were abandoned by the colonials. Children were not educated with the same intent as the settlers and colonials.[3] However, village children, like me, had an emerging methodology of learning that is lasting and closely associated with learning to write with a mother figure, not unlike that African Americans as noted by Geneva Smitherman (1986) in *Talkin and Testifyin*.[4] In Smitherman's research, she attributed children's literacy development to motherly practices and physical contact. In African, feminist, and Indigenous perspectives, honoring the body and not divorcing it from meaning-making of the mind is integral to mapping relationships among users of technology in everyday use. Body memory becomes integral to learning, interfacing, and archive learning relationships among materials that formerly colonized peoples used in communities of practices to honor the elders and traditional ways of knowing, valuing, and being.[5]

*Trinidad and Tobago: Of Paper Key Boards and Computers*
Before leaving Guyana to study in Trinidad and Tobago, I used to write all my college papers by hand on lined paper or typed on typewriters. In Trinidad, in the 1990s when computer classes were added to the curriculum, my writing life changed. I learned to *use* the computer. The year I took computer science, I did so with a young missionary whose philosophy was learning through *use*. His strategy was

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[3] Ishmael, Odeen. (2012). The transition of Guyanese education in the Twentieth Century." GNI Publications.

[4] Smitherman, Geneva. (1986). *Talkin and testifyin: The language of Black America*. Boston: Houghton Mifflin, 1977. Revised, reissued, Wayne State University Press.

[5] Cruikshank, Julie (1998). *The social life of stories: Narrative and knowledge in Northern Canada*, Lincoln: University of Nebraska Press and Vancouver: UBC Press.

unlike other teachers' comprised of practice in the computer lab preceded by lectures.[6]  Before going to the lab to use the computers, my class of 40 learners practiced keyboarding on paper keyboards—memorizing "shift F7" and the like, in the classroom. During my lab practice hours, we used 10 computers by taking turns. I did not type a paper; I made a program. Becoming proficient at word processing came much later when I taught in Palau, in the Pacific.

**Palau: Gaming my way to Computer Literacy**

I had volunteered to teach in an elementary school in Palau for a year during my third year of studies in Trinidad and Tobago, in 1991. Unlike Trinidad and Tobago, the school in Palau was equipped with more than 20 computers—at least each student in each class could sit at a computer to learn once a week. There, I practiced using the computer and in the process developed my typing skills alongside kindergartners and elementary school students by gaming. Like the learners, gaming literacies allowed me to merge entertainment, interactivity, and education at the same time. This combination of skills became part of the steep learning curve I climbed. In one year, I sent my first email, learned to use Microsoft windows, surf the worldwide web, created banners, typed tests, and papers. My typing moved beyond what Caribbeans call "look and juk" (two finger typing).

**Learning and Teaching with Multimedia**

In 1994, I returned to Palau to teach in a high school. During that time, I took my first fully online course—Computer Assisted Language Learning (CALL) to fulfill my Master's in TESOL requirements. Although internet service was costly, and sporadic, I collaborated with peers in the United States and around the world by going online on and offline intermittently. With my telephone service, I was allowed 2 hours of free internet monthly. First, I would log on to Yahoo groups, copy and paste all the discussions in the group to a Microsoft word file before logging off. Next, I would compose my responses offline and only log on again to post my responses.  For each lesson I learned, say in PowerPoint, I taught the secretary at my school. At the same time, I taught students to use various software and technologies to create multi-media literature projects (see Haiku play: http://academics.smcvt.edu/cbauer-ramazani/gsl520_online/students/HaikuPlay/multimediahaiku.htm).

I take a humanistic approach to technology literacy development; I am invested in interrogating people's *use* of technology in the practice of everyday life. A humanistic approach allows me to move conversations on teaching with technology beyond the technologies themselves to ways in which, we, educators might acknowledge technology literacy development as part of our life-course journeys. When I think of how the bulk of my technology literacies were honed in the Pacific, in a small place where most people might not expect, I also think of how learning with technology is shaped by where, when, and how people access technologies. With this realization, I listen to Stuart Selber (2004), an educator, who understands that computer literacies in the digital age are facilitated in nested contexts. Thus, in the context of the schools in Palau where I worked, the stakeholders played crucial roles in investing in technology and integrating its literacies into the curriculum, even though technological devices and platforms were changing rapidly in the 1990s. Within that context, while the technologies changed from

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[6] Some teachers required learners to produce bound scrapbooks on the history computers, their parts, and ways in which computers functioned

big floppy discs to small hard discs, then to thumb drives, the teachers learned alongside the learners. I am inclined to think that they now would consider embracing cloud computing in the age of big data. Embracing technological advances and change means that teachers and students have to be willing to reinvent themselves and adjust frequently.

**Japan: Lost in Translation**

Among the stories I tell about Japan are the ones about using the computer and teaching with technology to talk about attitudes to technology literacy development. In the years 2002 through 2008, I used the computer for word processing in both Japanese and English. I did not know Japanese before I went work at an Engineering University in Northwestern Japan. As soon I was issued a computer, I realized that practice and familiarity with the English keyboard means nothing in Japanese. Learning the features of the computer in another language forced me to depend on others and learn from them until I was able to do so for myself—much like when I was learning from Teacher Julie, in the village.

For six years, I taught undergraduate engineering students who were becoming more proficient in the use of technology. To grow that climate, teachers adopted a community approach to learning in that involved networking and interdependency among resource persons, places, and technologies. When technology did not work the way it was supposed to, learners and teacher call in the knowledgeable others to help.

Here is a story:

The video I plan to use for my lesson does play on command. Instead of panicking, with a smile on my face, I say to the class of some 25 engineering students, "let's get this fixed." I use the telephone in the classroom on the eleventh floor of the library and call the technician, as I am trained to do. Students wait quietly. The technician makes sure the robot in the basement runs the video and that everything is in working order. In a few minutes, the video runs.

A constant thread that connects my literacy development is with each location are practice, adaptive behaviors, and risk-taking.

**USA: Risk-taking & Making A "Very Bad Movie"**

In 2013, I bought a cell phone—it was about time. In 2013, I also reflected on my literacy in a 'bad movie" titled "Odyssey With Technology" (http://personal.bgsu.edu/~pbaird/techbio.html) that I began as a graduate school project in the graduate course "Computer-Mediated Writing Theory." In this project, I used an eclectic approach or a mash-up of voice narration, text, and images using Dreamweaver, InDesign, Audacity, PowerPoint, and iMovie to make an intentionally "bad movie." I reference this project to demonstrate that technology literacies are cultivated through use, messiness, practice, and risk-taking. I used story or narrative as a methodology for tracing my technology literacy development to map my literacy development. Learning the functionality of various software allowed me to exercise critical and rhetorical literacies based on the technologies that I could use and wanted to use. In essence, I exercised options for composing, and designing my story. I learned and used the Dreamweaver software to play

with non-linear delivery. As a result, if making an attempt to produce and deliver my own story in ways I envisioned was powerful, then I became a producer and not a mere consumer of digital content.

**Takeaways**

In higher education, although some writing teachers, among others, have embraced learning and teaching with digital technologies others have not and may not do so. Among the reasons teachers may not embrace using technology such as computers or personal devices in the classroom are cost, lack of knowledge and training (Selber, 2004; New London Group, 1996; Palmeri, 2012), preference for traditional modes of teaching and learning, issues with academic honesty (Evering and Moorman, 2012),[7] and the need to separate personal space from academic space (Powers, 2010).[8]

For teachers who wish to use technology in the classroom and are fearful or hesitant to use multimedia and different digital platforms, a self-reflective approach is useful to help us understand what experiences that make up our technology literacies can teach us. I am sure of several things:

- Teaching with technology, allows teacher-learners to get close to students and to themselves. Teachers can begin exploring their own journeys with technology.

- Exploring personal histories with technology helps teachers understand how they arrive at their histories, and how those methodologies influence how they understand and negotiate their classrooms and the world. While technology advances are rapid, the agency for writing pedagogy that includes technology--from low, to mid, to high tech—is compelling.

- We are in the company of scholars who learn from reflecting on their journeys. James Porter, a teacher of writing and a digital scholar, recounts his journey in his technology biography titled "Why Technology Matters to Writing: A Cyborg's Tale." Porter concludes that reflecting allows him to value the role of technology in his writing life. He illustrates how learning with and about technology is a matter of focusing on

  writing as not simply the activity of an individual writing or the isolated writing classroom (where the field of computers and writing has been strong, but also limited), but that [of] look [ing] closely at the socialized writing dynamic and the conglomerate rhetorical dynamic of readers, writers, and users and their impact on society. (388)

Porter's focus is on relationality among communities of users to say that the methodologies that people use to make knowledge in the digital age inform people's discourses on rhetorical practices at the micro and macro levels. Porter traces his own use of technology from early childhood through the 1990s,

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[7] Evering, L. and Moorman, G. (2012). Rethinking plagiarism in the digital age. *Journal of Adolescent & Adult Literacy*, 56(1), pp.35-44.

[8] Powers, W. (2010). *Hamlet's Blackberry: A practical philosophy for building a good life in the digital age*. New York: Harper.

spanning 3 decades. He takes a post humanist perspective to technology where he understands technology through the framework of "use."

- Geographic spaces are borders to cross though technology literacy. As I explored the roles of technology use and development of literacies in transnational contexts—the Caribbean, the USA, Micronesia, and Japan — I learned how and why my literacies and attitudes to technology in the classroom have changed.

- People and technology interact and impact on writing across our civil and academic life and are crucial in how we teach and learn.

- There is support for adopting digital literacies.

  I belong to a community of scholars—The Conference on College Composition and Communication CCCC—which in its "Position Statement on Multimodal Literacies" has supported and promoted the use of multimedia and multiple modes of technology for college composition (CCCC Website; Yancey 2009[9]).

- My village story with the slate counts as part of how I come to regard learning in the digital age. I understand, like scholars who embrace digital technologies, among others, that to teach composition is to understand that technology, in all its forms, shapes the ways, means, locations, and ideas about how teaching and learning happens. In the community of scholars of Composition, leading digital rhetorics scholars Cynthia Selfe and Pamela Takayshi (2007) have argued that technological literacies in the composition classroom help us foster "intelligent citizens" who create meaning "in an increasingly technological world" (p.8).[10]  What they mean is that the work of learning with technology is civic and part of the wider society.

- Examining Technology Literacies allows us to bridge the world of the ivory tower that is the university with the world in which the university exists. We bridge the world of indigenous communities on whose land the universities sit as separate from them. Students, regardless of where they come from are encouraged to explore the ways they use multiple modes of composing in their civil and academic life and learn "how writing is to be understood" (Haas,Takayoshi, Carr, Hudson & Polluck (2011, p. 378).[11] Educators, Bjork and Schwartz (2009) facilitate projects in which students use various tools to write, including the cell phone in both public and private spaces ("Writing in the wild").[12]  Their students gather, share, and write about their observations

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[9] Yancey, Kathleen. (2009). Writing in the 21st century: A Report from the National Council of Teachers of English https://www.jstor.org/stable/23050580?seq=1#page_scan_tab_contents.

[10] Takayoshi, P. & Selfe. C. L. (2007). *Multimodal composition: Resources for teachers*. Cresskill, NJ: Hampton. Print.

[11] Haas, C., Takayoshi, P., Carr, B., Hudson, K., & Pollock, R. (2011). Young people's everyday literacies: The language features of instant messaging. *Research in the Teaching of English*, 378-404.

[12] Bjork, Olin, and John Pedro Schwartz. (2009). "Writing in the wild: A paradigm for mobile composition." *Going wireless: A critical exploration of wireless and mobile technologies for composition teachers and researchers*. Ed. Amy C. Kimme Hea. Cresskill: Hampton, 2009. 223-37. Print.

of community practices and problems, using images, audios, and videos—*live* from the field. Projects involving civic engagement are just a few of many that signal a multimodal turn towards digital literacy development in the 20th century.

**Food for Thought**

Dear readers: I invite you to consider the following questions: "What if learners and teachers explore writing from the perspectives and practices in their communities, in Micronesia and beyond, and map the relationalities they make among other technologies?" "How do learners understand the impact of digital tools on access and equity in class and in the world?" "And what stories of digital literacies will emerge?"

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Yancey, K. B. (2009). Writing in the 21st century. *Ohio Journal of English Language Arts*, *49*(2), 70-79.

# Photographing FestPac: Confessions of a Self-taught Shutterbug

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When my friend Dr. Jacqui Cyrus asked me to write an article for this special ICT issue of *Micronesian Educator* that she was editing, and to discuss tips for photographing a cultural event such as the, May 2016, 12th Festival of Pacific Arts ("FestPac," as we all call it on Guam, using a linguistic shortcut borrowed from military acronyms like CINCPAC), I initially confessed to being unqualified to write about photography. Photography is a hobby of mine but I've never written about it seriously or studied it formally. After Jacqui—whose opinion I value—told me she thought my FestPac photos were the best she had seen, I reluctantly agreed. (Flattery, as any good editor knows, *can* get you somewhere). What follows are three brief tips for taking good photos, and a very small selection of photos I shot at FestPac to illustrate those tips. Thank you, Jacqui, for the invitation to contribute to your special issue.

My three photo tips can be summarized as: SHOOT! FOCUS! CROP!

1) SHOOT! Take as many photos as you can. Some years ago I met a professional photographer on a *National Geographic* assignment in Micronesia, and in the course of our conversation, I asked him how many photos he would normally take to get an article's worth of publication-quality ones. His answer amazed me: his ratio of photos published to photos taken was about 1:500. And that was in the days of celluloid film when we paid for the film stock, the darkroom chemicals, the developer's time, and the photographic paper. In today's world of digital photography, there's no cost—other than our time—in shooting large numbers of frames. At an event such as FestPac, with its hectic pace of activity, and the inability of the photographer to control for lighting or to set up the subject—as one could at, say, a wedding—my advice is to shoot, shoot, shoot. I mostly kept the camera in front of my eye and I took several hundred shots per hour. If your camera has a sports mode or burst mode, use it when you're photographing a rapidly moving object. In those shooting modes, when you press the shutter button, the camera takes several shots per second in rapid succession. Especially if you're trying to capture that fleeting moment when a dancer is in mid-leap, this feature is useful.

2) FOCUS! A good photograph should have a focal point of interest, a particular perspective, a story to tell. If your photograph simply reproduces your field of vision, without focusing your viewer's attention on a point of interest, you will lose your viewer's interest. It helps if you know something about the subject you're photographing, especially if it's a cultural event, because that knowledge will aid you in identifying moments of significance, points of interest, or particularly important details. The photograph should be well-framed and composed, so that extraneous background information does not

distract the viewer from what you are focusing on. As you shoot, pay attention to the whole frame, and try to arrange the shot so that only what you are interested in is within the frame. And this leads to the last tip:

3) CROP! If you are shooting a large number of photographs in rapid succession at an event such as FestPac, it is not always possible to frame each shot so that it is well-composed around a point of interest. That's when the crop tool in your photo editing software is useful. Cropping a photo is like editing a written text. You should communicate your ideas or viewpoint as succinctly as possible. If there are elements at the edge of your photo that do not contribute to the story you want to tell, crop them out. You may also find that there is a great picture *within the picture*, if you crop down to the detail that you want to focus on. For that reason, I always shoot at maximum resolution, knowing that I may crop out most of the frame and only use a portion.

The following photos were all shot with a Nikon D-7000 SLR, using a AF-S Nikkor 70-200 f/2.8G ED VR II Lens. The VR (vibration reduction) feature was important, as I was shooting without a tripod, and I was positioned about 75-100 meters from the subject.



1. The Solomon Islands delegation presenting wood carvings and shell belts to Guam's Governor, at the opening ceremony. I wanted to focus on the culturally significant items of wealth, especially the superb 10-strand-wide, 2-meter-long shell belt made from red Spondylus, white conus, and black copra shell beads.  [f/4.5, 1/320 sec., ISO-400, 200 mm]

2a (left) and 2b (right). Cook Islanders dancing at the opening ceremony. This photo was part of a series I took contrasting the graceful fluidity of the female dancers with the tense muscularity of the male dancers. I cropped this photo down to a single male dancer (compare the cropped photo with the original frame). [f/4, 1/250 sec., ISO-450, 200 mm]

3a (left) and 3b (right). Rapa Nui dancers at the opening ceremony. This photo is also closely cropped to focus on a single male and female dancer, showing the contrast in performance style (compare the cropped photo with the original frame). [f/4, 1/250 sec., ISO-720, 200 mm]

4. Polapese delegation from western atolls of Chuuk State, at the opening ceremony. They are presenting gifts to FSM President Peter Christian, and the photo illustrates the culturally appropriate posture of deference, and the honorific gesture of gift presentation, with one arm extended and the other arm bent at the elbow and held below the extended arm. [f/2.8, 1/125 sec., ISO-900, 200 mm]

5. Fijian dancers caught in mid-air, at the opening ceremony. This photo was tightly cropped to focus on the three airborne dancers, and to capture a dramatic moment in the dance. [f/4, 1/60 sec., ISO-560, 70 mm]
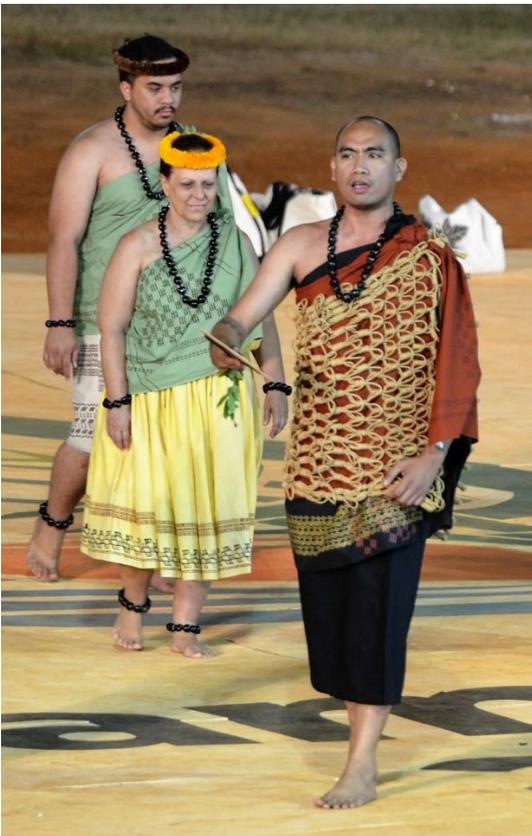


6. Three members of the Hawai'i delegation at the opening ceremony. Note the sennit fiber garment created and worn by Mr. Marques Hanalei Marzan, a cultural resource specialist at the Bishop Museum in Honolulu, who specializes in traditional Hawaiian fiber arts. Mr. Marzan has done detailed studies of Hawaiian knotting and netting techniques that were used in making string carriers for *ipu*, gourd water containers, and I wanted the photograph to focus on this remarkable garment. [f/3.2, 1/160 sec., ISO-800, 200 mm]

7. Taiwanese Aboriginal dancers at the opening ceremony, showing the precisely synchronous movement of the male and female lines of dancers, as they circled around, formed lines, and faced each other, in a highly geometric choreography. [f/4, 1/60 sec., ISO-400, 95 mm]



8. Chamorro cultural dancers at the opening ceremony, backed by the multitudinous Guam delegation, which numbered in the hundreds. I wanted to communicate the sheer size of the Guam delegation, which nearly filled the stadium ground. [f/2.8, 1/60 sec., ISO-1600, 200 mm]

9. Saipan male dancers performing on May 29 at Paseo, demonstrating an ancient line dance movement, each dancer placing one leg upon the leg of the adjacent dancer. [f/8, 1/20 sec., ISO-800, 130 mm]



10. Beautiful Tahitian dancer, performing at Agat on May 31. The whole Tahitian group was radiant, but this dancer seemed to shine even brighter than the others, and I wanted to focus selectively on her. [f/5, 1/400 sec., ISO-400, 200 mm]

4780 (2): Pacific dances generally do not feature solo performances, but rather, the dance aesthetic emphasizes the harmony and unison of all the dancers performing together. This solo performance by a handsome young Tahitian dancer, at Agat on May 31, was distinctive and impressive. The photograph emphasizes the suppleness and muscular control of the dancer, and the contrast between his relaxed facial expression and his demanding body position. Shooting from a diagonal angle to the dancer's body provides a more interesting and informative perspective than a profile shot here. [f/5.6, 1/500 sec., ISO-320, 200 mm]

12. A company of about 50 dancers from American Samoa, performing in Agat on June 1. I positioned myself at a diagonal to the dancers, to show, in a compact composition, the three lines of dancers—the women in the foreground and the men in the background—and the female dance leader sitting behind the three lines.  [f/6.3, 1/160 sec., ISO-200, 95 mm]

13. Pohnpei women's sitting dance, in Agat on June 1. The Pohnpei women have placed a long wooden board across their laps, and they beat out the rhythm of the dance with small percussive sticks. I shot the scene from one side rather than facing the dancers, in order to emphasize that the whole line of dancers appears as a single organism, moving and singing and tapping together.  [f/4, 1/250 sec., ISO-640, 200 mm]

# An Introduction to Chromebooks for Education

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**Abstract**

In an effort to prepare students for future success, many schools and school districts are looking to reach all students through a sustainable 1:1 environment. At the same time, educators are looking to accelerate learning through differentiated instruction and a broader set of learning resources. However, many school districts face the challenge of truly integrating technology into teaching and learning. Many schools have computer labs with PCs and Macs, as well as iPads and laptops in the classrooms but struggle with collaboration and integrating devices and technology into learning. In 2009, Google launched their Apps for Education in selected schools throughout the United States. In 2011 the first Chromebooks were released allowing affordable devices that update automatically and are easy for schools to set up and manage.

**What is a Chromebook?**

A Chromebook is a laptop running Chrome OS as its operating system. The device is designed to be used primarily while connected to the Internet (Bassett, 2013). In many ways, a Chromebook is a standard laptop that acts as a thin client with most applications and documents residing in the cloud utilizing Google apps, built-in security, and easy central management (Google.com, 2016).

A Chromebook can be used for creating documents, accessing the Internet, email and video conferencing, just as on a Windows device or Mac. But in other ways, it's an entirely new kind of portable device. Running Google's Chrome operating system, and calling upon Google applications on the Cloud, such as Google Docs, Google Sheets, and more, the Chromebook is a lean and focused machine that isn't dependent on software stored on the hard drive (Google.com, 2016). Simple and secure, the Chromebook makes getting things done in and out of the classroom quick, easy, and affordable (Bolluyt, 2016).

One nice feature is that the setup on a Chromebook can be completed in mere minutes (Thejournal.com, 2016). Simply plug it in, turn it on, and log in using your existing Gmail email account username and password. Once logged in, users have access to a free suite of communication and collaboration tools including Gmail, Classroom, Docs and Drive for learning anywhere, anytime, on any device.

Most school districts use technology as part of a strategic plan but often sharing of information involves numerous back-and-forth emails with attachments created on varying versions of Microsoft Word. Within the classroom, accessing and sharing documents can consume valuable instructional time. Often organizations work to bring more technology into local schools, primarily by introducing more devices into classrooms for students and teachers (OECD, 2015). Many times, funds are not ample enough to achieve a minimum standard for technology access in every classroom, like prioritizing devices for students to use on a daily basis. Here is an area in which the Chromebook excels.

**Cost**

The global shift in education technology means that in the future the ten billion dollars once spent by schools mostly on PCs will be divided between tablets, Chromebooks and netbooks (Ackerman, 2013). One of the most popular technology choices for schools today is the Apple iPad. Of the different versions of the iPad that Apple sells in the Apple store, the least-expensive option is the WiFi-only, 16GB iPad mini 2, at $269, and prices go up and up from there (iPad, 2016). Chromebooks, on the other hand, are offered in a more diverse and more budget-friendly lineup. One of the lightweight computers can be purchased for as low as $179, with most models at prices of around $250 (Google.com, 2016). High-end units are available but are not necessary for most school-based needs.

When comparing the Chromebooks to Microsoft Windows based computers there are many considerations to weigh for the educator. The current Windows 10 operating system version running on a PC offers many more programs, powerful photo and video editing options, added browser choices, expanded productivity programs along with file type support and greater hardware options. However, the Chromebook often ends up being less expensive to repair or replace than an iPad or a traditional PC. Cost, paired with the simplicity of the cloud and working in a secure, yet simple environment, may be more productive in a school setting (Palladino, 2015).

**Capabilities**

An iPad is fun when downloading and using apps, but if schools are going to depend on a device for any kind of web browsing, a Chromebook may be a better choice. Using the Internet on a Chromebook is an experience akin to the browsing experience on any laptop, and just about any site that is navigable will be usable. With the iPad, on the other hand, users often run into issues when sites aren't optimized for the tablet's display (Bolluyt, 2016).

Furthermore, with iPads, downloadable apps are one way to work around website issues, but not all web-based programs have apps. Google has an application store built into the Chrome operating system and all of the apps for a Chromebook are web-based. Most of the productivity applications are designed to be used with a keyboard and mouse rather than with 'touch technology' as with the iPad's touchscreen (Bolluyt, 2016).

Many of the newer Chromebooks have touchscreen capability so if students or teachers have an Android phone or tablet already, a Chromebook is an easy choice, since the devices use their Google account to keep all of their files and applications synched (Herold, 2014). Laptops running Microsoft

Windows have some of these same capabilities but are not currently at a comparable cost as a Chromebook.

**Keyboard**

Chromebooks have built-in keyboards as part of the device, just like a traditional laptop. An iPad doesn't have such a device unless purchased separately for additional money. Chromebooks can perform many tasks, e.g., from sending emails to browsing the Internet; having a keyboard, therefore, is most practical. Using a Chromebook at school and being able to type documents on it is a major plus as it is much more easily accomplished on an actual computer than on a tablet. Even the task of typing in a URL to navigate a website can be difficult when relying on a touchscreen keyboard instead of a physical keyboard and a mouse. A Bluetooth keyboard or a third-party keyboard case can be used for an iPad, but it is one more piece of hardware to maintain. A device in the form of a laptop is easier to use and more easily portable than a tablet that needs an assortment of accessories to approximate the functionality of the laptop (Forrest, 2014).

**Maintenance**

It can be a lot of fun to browse the App Store on an iPad, or download files to be stored locally. But sooner or later, it is likely that students or tech administrators will want to clean up or simplify the selection of apps to maximize the device's storage. With a Chromebook, almost nothing is stored locally, so there is no need to dedicate the same amount of time toward maintaining a clean device. Additionally, it is important to pay attention to updates not only for the iPad's operating system, but for each existing, installed app. A Chromebook automatically checks for and installs updates each time you start it (Google.com, 2016). This simple form of software maintenance is ideal for busy school systems and tight budgets.

The biggest advantage is clear when dealing with the administrative task of setting up multiple devices for hundreds of student and faculty accounts. Chromebooks can be set up in a few minutes; technicians and administrators can centrally manage 10 or 10,000 devices across any school, district or region (Google.com, 2016). Administratively, technicians can remotely control the use of Chrome devices, prevent outside users from logging in, disable Guest Mode, or designate specific types of users. Applications can be blacklisted, whitelisted and pre-installed. Web extensions and URLs can easily be monitored as well.

Tracking the devices is as easy as assigning devices to specific students and faculty. Once deployed, configuration and usage reports can be generated. Schools can apply policies, apps and settings to different sets of users. Teachers can group students by grade level or subject and the web-based management console makes it easy for schools to configure and manage a set of Chromebooks across a school, district, or country (Google.com, 2016). The low price of most Chromebooks is one of the selling points and allows them to be easy to repair.

**Creating and Sharing**

The iPad was mainly created for consumption, and not necessarily with creation in mind. The keyboard cover started as an aftermarket hack, and creating anything more than nuggets of text has

always been an unsatisfying experience on an iPad (Forrest, 2014). The Chromebook has one huge advantage over the iPad that even the most hardcore iOS fans cannot dispute. It was built to type on.

A good argument can be made that an iPad can accommodate many different types of inputs and enables creation with video (two cameras and all those video editing and picture apps) and sound. The iPad additionally enables creation with the finger, gesture and touch. Many of the newer Chromebooks have touch screens as well. While writing is a non-negotiable element of learning, typing on a Chromebook keyboard is better than an iPad touch screen (Forrest, 2014).

The argument that the iPad is adequate for creating can be tested by trying to live with only an iPad. Consider how far you would get in your work if the only available device was an iPad. An iPad is often used as a complement and a supplement to a laptop, not a replacement. iPads may be brought to meetings with an attached keyboard, but for serious work (which almost always means creating documents), the laptop is paramount (Tynan, 2013). Schools should consider this if they expect students to want the same capabilities.

**Fully Utilizing the Web**
The decision to select iPad or Chromebook is really a decision between the app or the web access. Or in other words, the question to ask is: should students learn in an app or on a web ecosystem? The app world is seductive. The interfaces are slick and the features are many. The problem is that these interfaces are surrounded by fences and border guards (Molnar, 2014). The price of admission is the cost of buying into the iOS ecosystem, which means purchasing a device manufactured by Apple. This may be a fine choice for the consumer, but it is less defensible for the educator.

Building teaching and learning around an iOS device also means that only those in the iOS club get to participate. Often students can't connect, share or learn from anyone outside of the club (Kim, 2014). The Chromebook, by contrast, is connected to the Internet and can still be productive when off-line with the built-in Google Docs (Schaffhauser, 2014).

The Internet has the advantage of being open to anyone with access. The rapid growth of Internet-connected mobile devices and efforts to build out national and global broadband infrastructure will ensure that the numbers will increase at exponential rates (Stern, 2013). Students using a Chromebook to supplement learning can share materials and creations with everyone else on the Web. They can also access the same sites and use the same tools.

**The Google Ecosystem for Collaboration**
The final consideration for a Chromebook versus an iPad, in a 1:1 setting where the only device that the student will reliably have is the one you pick, is that the Google ecosystem allows for easy collaboration.

The advantages cannot be oversold. A platform that encourages and facilitates teamwork will be a platform that encourages and facilitates learning. A Google Doc created in Google Drive can be easily shared with anyone on the Web. It can be read and worked on by a team. Any participant only needs nothing more than some access the Internet (Tynan, 2013).

It may be that at some point Apple will catch up to Google with cloud-based collaboration tools. At that point, however, only those owning an Apple device will ever be able to take full advantage of the Apple creation and collaboration platform (Goddard, 2012). With the Chromebook a student is seamlessly connected to the Google collaboration ecosystem. It is an ecosystem that does not require the ownership of Google hardware to take full advantage.

All the learning and the work that the student invests to learn how to use Google collaboration tools will be relevant in their future education and work life, even if they never own another Chromebook. Other laptops running the iOS or Windows platforms are very similar to the operation of a Chromebook. The main difference here is cost, which is a strong selling point for any school budget.

**Future Considerations**

There are future considerations for Chromebooks that go beyond the hardware and features. Google has released their "Google for Education" suite that includes all of the document creation and sharing tools as well as "Google Classroom" which was designed for teachers and students to connect the class, track progress and achieve more together (Google.com, 2016). Google Classroom is essentially a simple and easy to use Learning Management System (LMS) that allows teachers to create classes, distribute assignments, send feedback, and see everything in a single paperless setting. Google Classroom is a free service for teachers and students that can be administered at the district level and then deployed to teachers and students. Google classroom can be discussed at great length and may be further explored in future articles.

The final step and possibly the most cost effective means to implementing the Chrome Operating System into learning is the Neverware "CloudReady" solution. Utilizing the CloudReady Google Management Console, schools can install and run the Chrome OS on existing computers. Most older and outdated common PC and Mac hardware models have been certified to run the Chrome OS. The lightweight, browser-based design means schools can put older machines back into the hands of students for a cost of $59 per device. This cost includes expert technical support via phone, email and live chat. Licenses are transferable between different hardware and fully automatic lifetime updates are included (Raphael, 2016). CloudReady makes sense for schools where budgets are limited and old devices are often plentiful. As many administrators will tell you, avoiding new purchases by making old devices serviceable is a sensible alternative.

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**Links and Resources**

*Why a Chromebook? Online tools for these common tasks.*

There are millions of web resources you can access on any web-based device, but here are a few suggestions for web apps that you can find in the Google Chrome Web Store or that simply work directly in your browser without the need of an app. These work in the Chrome browser, on a desktop or laptop, and of course they work on Chromebooks.

| If I want students to . . . | . . . they can use this app or resource. |
|---|---|
| Create a document | Google Docs |
| Create a presentation | Google Presentation<br><br>Prezi |
| Create a spreadsheet | Google Spreadsheets |
| Create an audio response or presentation | VoiceThread<br><br>Schoology<br><br>TwistedWave |
| Create a webcam video recording of themselves | VoiceThread<br><br>WeVideo |
| Take pictures | Chromebook camera app<br><br>Webcam Toy |
| Create and edit a movie | WeVideo<br><br>Animoto |

| If I want students to . . . | . . . they can use this app or resource. |
|---|---|
| Create a graphic/drawing & Photoshop-like editing | GoogleDrawings<br><br>SumoPaint<br><br>SketchPad<br><br>Pixlr Editor<br><br>PicMonkey<br><br>Pixlr Touch Up (offline app) |
| Create a comic strip | MakeBeliefs<br><br>ComicMaster<br><br>Chogger<br><br>ComicCreator<br><br>Pixton Comic Strip<br><br>Powtoon |
| Create a Thinking Map | GoogleDrawings<br><br>LucidChart<br><br>Cacoo |
| Use a graphing calculator | Desmos Graphic Calculator |
| Interact w/ digital geometry | Geogebra |
| Learn about astronomy | 3D Solar System<br><br>Planetarium |

| If I want students to . . . | . . . they can use this app or resource. |
|---|---|
| Create graphics | 3D design publisher<br><br>Build with Chrome<br><br>Lego Builder |
| Practice keyboarding | TypingClub<br><br>Typing Web Typing Tutor |
| Speech to text | Dictation<br><br>Speech Recognizer<br><br>GoogleSearch |
| Use a digital whiteboard | Simple Whiteboard |
| Access & read eBooks | GoogleBooks<br><br>Kindle Cloud Reader<br><br>Open Library Book Search |
| Access online textbook content | Open Educational Resources Commons<br><br>CK12.org |
| Create & interact with maps | GoogleMaps<br><br>ScribbleMaps |
| Build/interact with vocabulary | Vocabulary/Spelling City<br><br>InstaGrok Search Engine<br><br>Flashcards |

| If I want students to . . . | . . . they can use this app or resource. |
|---|---|
| Work with a PDF | PDF Zen |
| Create 3D objects | Tinkercad<br><br>3Dtin<br><br>PublishYourDesign |
| Work on music composition | AudioSauna |

# Technology in a Rural School

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**Abstract**
What purpose does technology have in a school located in an urban/rural setting? What roles do administrators, faculty, staff and students have in the successful implementation of technology in the classroom? What learning outcomes can be expected from the use of technology as an educational aide? This article briefly addresses these questions.

Imagine the beginning of the school year with 25 faculty and 10 specialist staff with brand new iPads as part of their new image at their school, a school located in a semi-urban area surrounded by rural conditions. The faculty and staff have to quickly learn how to use their iPads and set up their Google Class Rooms before students arrive. Five days later—imagine more than 300 students being issued their own school iPads, school IDs to log in and their excitement with their new gadget. A month goes by and complaints have been pouring in from faculty and staff, parents, and some students:

- I can't log in. The system does not recognize my ID.
- I log in but all I get is the little circle turning and turning. I'm getting dizzy.
- Do we HAVE to use Google Class Room this semester or can we wait until…?
- I HATE this thing!
- Can you please take the iPad away from my son and daughter? I can't get them to turn it off at night. It's 2:00 or 3:00 a.m. and they're still playing with it!

These remarks were the product of anxiety. There were also complaints of lost, stolen or broken iPads, inappropriate use of the instruments and bullying-type behavior related to the type of use of iPads among some students. Other remarks were also heard from faculty, staff, parents and students: *"Way cool! Awesome! It's about time we got on top of the game! Welcome to this century!"* Obviously, these remarks were made by those who embraced the new technology at the school. A number of questions arise: What purpose do iPads and cell phones have in a classroom setting? How is technology being used at this particular school? Here are some comments shared by faculty members:

*Science teacher*

> …typed papers are easier to read [because students are] able to edit word processed vs handwritten papers, students learn how not to cut and paste, spell check and fact check, look up info pertaining to our lessons as well as integrating our working technology in many other ways. I am for technology as a supplement in my courses and look forward to really enhancing and organizing lessons to include links in my syllabi for next year.

*Japanese/Financial Literacy teacher*

> I find kids MORE interested in asking questions, because we can all get involved and say "good question," debate, and then Google it!  They get excited to be able to find the answers and learn something new.  We can debate different sources and different ways of explaining things that they may find on the web, and many more students are in touch with their grades (and motivated by that).

*History/Government/Economics teacher*

> I have found iPads very useful this year and have used them in a variety of ways…students get interested in what we're discussing and then they look up questions related to the topic, which gets everybody else interested too. Like any tool, computers can be used to enhance, or to detract from learning.

*Spanish—as second or heritage language/AP Spanish Literature & Culture*

> In Google Class Room, I placed Youtube items, maps, articles, links to incredible resources and many assignments, — all in Spanish and at different levels. Students were able to do individual and small group assignments, which included peer-editing and group oral presentations with Prezzi or other audiovisual tools. To have students see and hear Spanish-speaking people from around the world was priceless because it connected students to the global presence, the reality of Spanish. As one student said, "¡El Papa habla español! The Pope speaks Spanish". Academic learning became audibly, visually "real". Eating a tropical fruit salad, while watching a video on a Dominican couple dance bachata, followed by a map/cultural reading of Dominican literature made the learning of Spanish a three dimensional, multi-sensorial experience.

The school interventionist sees the use of iPads and cell phones as positive tools that teachers can use to work with all kinds of students, especially those who are considered "at-risk" or who have special learning challenges.  She finds that these learning aides can complement classroom instruction and students find the use of these e-tools energizing, inspiring and even relaxing. For teachers, the use of e-tools can facilitate multitasking, removes policing time since students usually stay on task and do complete assignments, which in turn are submitted electronically. Classroom drama from the teaching/learning environment is reduced.

Given that 23% of the nation's teachers work in a rural environment (Basye 2014) where lack of resources, limited bandwidth "can reinforce a feeling of geographic and societal seclusion," having global access is imperative in today's educational settings. Rural students also need to become and stay competitive in order to enter colleges and universities outside of their immediate environment. Educating at-risk students, especially in rural settings can seem extremely daunting. "Children in poverty now make up nearly half of our public school students. The nation's 23.8 million minority students also comprise nearly half of the school population, and many of them are underserved by their school systems." (Darling-Hammond et al, 2014). In New Mexico, many students are also limited in English proficiency. These students may have either Spanish or one of the Native American languages as their home language and many live in extreme rural conditions without Internet at home. In addition, ELL students, those who are English language learners, may also be part of the at-risk population.

Given these factors, one can ask: What is the role of school administrators, faculty, staff, and parents? School personnel who work together to bring technology to the classroom need to plan, facilitate, organize, and constantly review the use of social media and the Internet as a component of the teaching strategies implemented in the learning processes. The best technology cannot replace a good or great teacher. Best practices indicate that faculty and staff receive training in the use of technology. Teachers who feel comfortable using gadgets will most likely plan and facilitate learning for their students, especially if the decision to use technology in the classroom is based on sound pedagogical best practices used in their content areas, rather than have an administrative decision-based situation handed to them. In other words, a "bottoms-up", shared-governance rather than a "top-down" executive order could alleviate initial anxiety and have more "buy-in" from all faculty and staff. If parents are included in the community-engagement or parent/teacher conferences, then students will benefit from having a learning environment that includes technology beyond the school environment.

In 2011, Marge Scherer and Karen Cator reported an exemplary use of technology in the classroom. They share their experience at Mooresville Graded School District in North Carolina: "*All students, from 4th grade to high school had their own laptops, and they were using it to do work*". Whether it was math, or science or English class, the infrastructure and the learning environment were conducive to having students actively engaged in their own learning process (Scherer & Cator, 2011). This is distinctly different from the reported experiences in different schools in Parral, Chihuahua, Mexico where students are prohibited from using their cell phones in the classroom because they become distracted from the lessons in the classroom and can easily engage in social media or prohibited internet access; although inappropriate use of technology is reported as more frequent in elementary schools since high school students have learned that having apparatuses removed and given to parents is not favorable behavior (El Sol de Parral, 2015). In the city of Albuquerque, New Mexico, several public and charter schools with an "A" rating in academics also prohibit the use of cell phones, iPods, and iPads during class time, unless it is teacher-guided. The same holds true for other schools with superior academic ratings.

So, what is the role of technology in the classroom and what can school personnel do to facilitate exemplary use of it? Obviously, planning and training go in hand but each school will determine what is best for its students. Scherer & Cator (Op.Cit.) report that the Mooresville Graded School District first provided their faculty with summer institutes to train them in the use of classroom technology and, during

the year were provided with assistance from technology facilitators and media specialists. Parents were introduced to the technology plan in a symposium designed for them. Consequently, "…the school's district academic performance continues to improve at every school, with a 13 percent gain on state test scores…" (Ibid.)

Technology is here to stay and teachers, whether in rural or urban settings, will continue to find creative solutions to the challenges offered by ever-changing standards—including the ISTE (International Society for Technology in Education) Standards, learning outcomes that include digital literacy, budgetary constraints, global market expectations, parental pressures, and their own willingness to see challenges as opportunities for new explorations and implementations to teach their "screenagers" and "screenies" (my term for students of all ages who use technology comfortably for their learning and socializing processes).

School administrators, grant writers, and faculty will continue to work with the national technology plan as they ascertain that there is sufficient bandwidth in their school and in their community and, if they are to remain ready to participate in the global challenges, this (2010-11) report on Innovative Teaching and Learning offers the following:
https://www.google.com/#q=innovative+teaching+and+learning+research+2011

This study of teaching and learning ecosystems was carried out in seven countries: Australia, England, Finland, Indonesia, Mexico, Russia, and Senegal. Recommendations offered in this report will serve as the basis for the continued evolution of the program, as its focus shifts in the coming years from research on teaching practices to support for improving teaching practices.

Key Findings from ITL Research in 2011 include: Innovative teaching supports students' development of the skills that will help them thrive in future life and work. • However, students' opportunities to develop these skills are typically scarce and uneven, both within and across the sample of schools in the study (across all countries). • While ICT use in teaching is becoming more common, ICT use by students in their learning is still an exception in many of these schools.  • Innovative teaching practices are more likely to flourish when particular supportive conditions are in place. These conditions include: • Teacher collaboration that focuses on peer support and the sharing of teaching practices • Professional development that involves the active and direct engagement of teachers, particularly in practicing and researching new teaching methods • A school culture that offers a common vision of innovation as well as consistent support that encourages new types of teaching • While we saw examples of innovative teaching practices in the classes we visited, a coherent and integrated set of conditions to support the adoption of innovative teaching was lacking in most of the schools and all of the systems in our sample.

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# Engaging Adolescents with the New Digital Literacies

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**Abstract**

Present day adolescents are completely immersed in technology and use these technologies to read, write, research, and communicate. Digital literacies are multimodal, networked and collaborative, and can be used simultaneously.  In order to relate to contemporary adolescents, teachers must become familiar with digital technologies, emoticons, and abbreviations used in instant messaging.

In order to match in-school literacy experiences with out-of-school literacy experiences and to increase motivation in the students, several techniques are suggested.  Among these are Wilber's ideas that offer the following suggestions to teachers:

- Use student knowledge that is familiar to them such as blogging, creating web pages, or videos.
- Let students use sound, video, still images, or hyperlinks in their assignments.
- Teach students about how to read and research online.
- Let students download audio books or materials, and record class sessions for student use online.  (Wilber, 2008, p.59).

Present day adolescents are completely immersed in technology and use these technologies to read, write, research, and communicate. Digital literacies are multimodal, networked and collaborative, and can be used simultaneously.  In order to relate to contemporary adolescents, teachers must become familiar with digital technologies, emoticons, and abbreviations used in instant messaging.

Meanwhile our schools have made little change, and this disconnect threatens the authenticity of education.  Too many potential connections and openings into our students' interests and lives are being disregarded when teachers ignore the importance of the new literacies.   Understanding these literacies will help teachers and students to connect and build on the expertise and motivation of the students. A pedagogy based on these new literacies will have students creating web pages or videos, incorporating digital literacy elements into their writings, using critical reading and research methods, and creating bridges between schools and communities.  It's time to explore other methods of learning that have little to do with pencil and paper.

In order to match in-school literacy experiences with out-of-school literacy experiences, several techniques are suggested. Among these are Wilber's ideas that offer the following suggestions to teachers:

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• Let students download audio books or materials, and record class sessions for student use online. (Wilber, 2008, p. 59).

Teachers need to encourage the use of ICTs (information and communications technology) not only to capture the interest of students but also to prepare them for the world of work where expertise in the use of ICTS is expected.

With available technology, students can connect, create, read, film, write, record, think, and represent themselves through a variety of media that was formerly unimaginable. Adolescents make use of critical thinking skills when they adapt the language they use to match these assorted media available to them. Wilber suggests that, "…students must make choices in terms of genre, language, audience, and intent" (Wilber, 2008, p. 61). Teachers should be fostering the students to make wise choices. Students also need to be aware of the appropriate discourse of the media and be able to evaluate the effects that using specific technologies have on their lives and the message that they are sending.

Secondary language arts anthologies have been less than responsive to the new definition of text and the use of digital literacies and popular culture. Largely, they have added more women and minority writers, but they have not answered the need for making instruction authentic and connected to real world experiences. Teachers are forced to supplement the anthologies with current information, which may challenge the traditional definition of text.

Allen Web was an English professor who met the challenge head-on. He found himself with an anthology that he had ordered. With no text book, he assigned his students the task of finding poems that related to them and asking the students to describe the poets' use of language and imagery. He gave the students many websites to peruse. Students were able to use recordings of poems read aloud, sometimes by the poet. This assignment brought students into contact with professional poets and poetry scholars. The students raced from website to website building their own anthologies of favorite poems and posting the links on blogs while inviting other students to respond to their choices.

Web was concerned that students would passively view the websites as movies and not carefully analyzing the imagery and noticing the word choice. He projected a poem and focused on particular words and phrases in order to model the critical reading of a poem. In order to respond to the literature, the students copied and pasted the piece on a MS Word document. Then they were directed to delete and return at intervals thus dissecting the poem. Students asked if they could add their own words, and this

begin a series of compositions using the skeleton of the classic poet. These new works were published on the blog and critiqued by fellow students.  The students became empowered by becoming members of a community of poetry writers that would not have happened if they had been restricted to the use of the textbook.

It is not so difficult to add Internet resources to the writing curriculum.  A popular website for assisting teachers with the transition is the Annenberg Media site.  This site provides guides to developing writers with the website: www.learner.org/resources/series194.html.  The Library of Congress webcasts feature authors such as Sharon Creech and Walter Dean Myers who act as mentors for young writers and are willing to share email messages.  After the students has crafted a writing piece, they might use the Writing Process website for suggestions in revising and editing their work.

Shelley Xu focuses on four aspects of New Literacy Studies: literacy practices, context, text, and discourse communities. She encourages teachers to think of literacy practices beyond reading and writing about traditional, print-based texts. Instead, teachers must present literacy in a broader context, such as interacting with print, visual texts, auditory texts, and digital texts.  Examples of these are using a digital textbook, listening to an audio book, researching information using Google, text messaging on a cell phone, and watching a movie. This reasserts Hartman's definition of text as both linguistic and non-linguistic signs used to convey meaning (Kallus, 2011, p. 76).

The abilities of students to create multimodal texts can be bridged into new forms of text in the literacy classroom and taken into account when thinking about reading online and gathering information. For example, strategies students use when gaming can also be transferred to the classroom by designing scenarios and learning situations that challenge students and allow them to work collaboratively as well as individually. Immediate feedback in games helps generate learning and understanding and is evident in video games. Video games also present the player with the exact level of difficulty to keep the player engaged. The new technologies that students use outside of the classroom should be part of the tools they have access to inside the classroom as well. Schools must become the chameleon that changes color to fit the new digital landscape.

Sites such as YouTube or wikis allow users to add or change content and to be collaboratively creative.   The use of these sites encourages the reflective process in those creating the message and means that the student potentially becomes reader and author. Online blogs offer feedback and allow students to use collaboration in their writing.

Social learning has emerged as part of the new literacies. The need to connect and communicate means that much of social networking is done through cyber connections giving adolescents an important source of emotional support.  Creating a profile on Facebook or My Space is an example of social networking.  Connections between individuals can be built and traced through a tangible social network. Participants are able to stay immediately updated with friends and activities.  During the course of a unit on Rome, a group of high risk secondary students were given the opportunity to create Face book pages for Roman mythological characters.  They remained engaged and brought creativity to their entries, which they were eager to share with classmates.

The use of social networking in the classroom need not be narrowed to social activities, but should include academic discussions as well.  Using fan-fiction and other such websites can pique the interests of many students in discussing literature, not only with their classmates and teacher, but also with readers across the world. The students might also find themselves chatting with the author of the book they are currently reading. For this generation, social networking is vital. These social networking sites have produced specific kinds of literature with precise rules of discourse.

Teachers must understand how the World Wide Web has matured and shifted since its introduction in 1995, referred to as Web 2.0.  Web 2.0 is less about receiving information and more about creating and re-creating it.  When teachers choose to mix traditional forms of teaching with digital literacies, ground rules are established and immediate communication is sparked. On wikis, an outline and purpose for the project can be posted and monitored by the teacher (Sweeny, 2010, p.120).  By understanding new literacies of students, teachers can make connections to our students' lives that are immediate and powerful (Kallus, 2011, p. 73).

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# Minority Report on the Role of Critique in Technically Fortified Learning Culture

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*"Es ist ein eigentumlicher Apparat," sagte der Offizier zu dem Forschungsreisenden*. –Franz Kafka

("A remarkable apparatus," said the officer to the explorer.)

The book has now ceased to be the root-metaphor of the age; the screen has taken its place. –Ivan Illich

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*This essay is written for teachers and students who are in no hurry to abandon book culture and concede total dominion to technology, whether in the classroom or at home, even while appreciating the stylized intricacies and conveniences of technological products. We--the bookish ones--are idealists, stubbornly inspired by the anachronistic belief that the inculcation of book culture and critical habits of reading in the schools, student by student, book by book, would, at little expense to the system, solve problems of unruliness, inattention, anomie, and disrespect that now plague classrooms across the system regardless of their technical sophistication. Without the attentional discipline and empathy that are integral to book reading, gadget-distracted students have enormous difficulty developing the intellectual and moral command center that used to be called: the soul.*

There is a growing unease among those educators still unaccustomed to seeing students on campus compulsively preoccupied with their smartphones instead of with each other, books, or urgent issues that require face-to-face interaction. They suspect that app-dependent students are noetically possessed or spellbound, hence, not mentally present while physically in attendance. Their unease, which said educators keep to themselves, arises from a fear that digital devices are not prosthetic extensions of the human being, but rather, humans are prosthetic extensions of technology, its unpaid salesforce and fandom, whose sole purpose is to disseminate product "likes" and thereby quicken the worldwide proliferation of technologies until they become naturalized or "organically" integral to reading, writing, and remembrance. At that point in time, known as the post-human epoch, hi-tech purchasing and updating will be automatic, standing orders for gadgets shiny and new, ever ready to capture attention in the schools; while in the history texts collecting dust in the rear of the classroom, long ago replaced by podcasts and downloads, teachers, pencils, and books are mentioned in passing as curiosities of the bygone "human" stage of educational history.

Is the above scenario only a phantasm generated by wooly traditionalists? The infiltration of the global community and its connected (and for now, blessedly far-flung and diverse) learning cultures by digital networks and social media is no longer a matter of conjecture or impending development, but a *fait accompli*, with the only noteworthy variables being the pace, content, and quality of infiltration in different locations. It has long been puzzling to me why so many teachers and scholars write articles promoting the use of technology when it already represents the status quo in education, thereby *preaching to the choir*. In many cases it would be more worthwhile to assess the effectiveness of specific technologies for improving learning outcomes for specific groups of learners--a far more difficult and by no means predictable undertaking. Some of the research articles in this volume of *Micronesian Educator* take intelligent steps in this direction. I first realized how far things had gone when a colleague with local roots politely argued at a faculty meeting for a policy that would require all professors in our division to join Facebook and its two billion other users. Our subsequent discussion deemed such a policy superfluous due to the fact that all but two professors had already joined Facebook. It did not seem to occur to this esteemed colleague, who teaches postcolonial theory, that critical theorists influenced by Habermas and Husserl have for years protested Facebook's colonization of the lifeworld (Crossley, 2005), and that by advocating Facebook on Guam my colleague was inviting a new wave of colonization. Nor did my colleague, and many other fair-minded fans of Facebook, anticipate that Russian agents would spread disinformation on Facebook in an effort to tilt the election to Donald Trump (McCarthy, 2017). Joyful users, including professional critics, took Facebook at its word that it was intrinsically neutral and benevolent, although certain events have exposed it as a manipulative monopoly which I call the *digital Leviathan*. What can explain such uncritical behavior? Aside from product enthusiasm, which softens the user's objectivity, I would argue that Facebook fandom among academics was primarily motivated by associating the new technology with prestige of the cutting edge, although it is as common a product as Budweiser and Tide detergent for billions of consumers. According to this uncritical viewpoint, a reputable English department that avoids Facebook looks old-fashioned and not, say, critically austere. It is a sign of the times we live in that there is nothing flattering in the appearance of being highly selective in technology adoption. Questions about conformity and intellectual servility that would have arisen in times of cultural revolt fail to disturb hi-tech enthusiasts.

At the risk of generalizing, I would argue that for the truly remote, underfinanced institutions, it remains the case that rather than cherish their critical distance, their disjunctive, hence still negotiable relation to hegemonic trends, they act like parents who fear that their children will lag their peers if they are not given a smartphone, or "fall behind in the race for success if they do not keep up with current information" (Poster, 1990, p. 7). Mark Poster long ago hit the nail on the head when he said, "Information is presented as the key to contemporary living, and society is divided between the information rich and the information poor" (7). It did not take a crystal ball to foresee how institutions of higher learning would fall for this ideology that values information over knowledge and wisdom, the traditional aims of education, and by doing so abandon any and all pretenses to learning as a spiritual vocation. Read the job description of the medieval teacher and cry—or laugh hysterically: "The ultimate task of the pedagogue is that of a guide who helps the student grasp the Good, *bonum*, which, in turn, will bring the pupil to wisdom, *sapientia*" (Illich, 1993, p. 9). As for technology, anyone who assumed that educational institutions employing the best and brightest would demonstrate a tentative pattern of receptivity, less

vulnerable to total infiltration, overlooked academic trust in technology as a magical cure for pulling schools out of their doldrums. Implicit in this Faustian contract with technology is the melancholy realization that human instructors have failed to effectively awaken and optimize the *force of attention* latent in their students, the collaborative mobilization of which in former (bookish) times led to landing astronauts on the moon. The faculty of attention was not, nor is yet, sufficiently understood by educators, nor the stylized *attention capture* capacities of commercialized hi-tech, when the first invitations were extended to retrofit classrooms with digital technologies, whose most recent manifestation is, as I will discuss later, "Googlification" of targeted school districts in Chicago and New York. It is as if educators naively presumed that educational technologies would be generic in design and neutral in their psychosocial effects, instead of branded and coyly designed to instill addictive if not fetishistic loyalties that undermine scholarly objectivity. As a result, it seems inarguable that academia, which in collaboration with the military gave birth to the internet, accelerated its global hegemony. Is critique--and its more copacetic brethren, highly touted by administrators, "critical thinking"--possible within such an overdetermined framework that sees only an upside to technological innovation? If hi-tech companies and universities are conjoined ideologically, and if we believe what Franklin Foer (2017) says about tech companies, it follows that universities have helped extirpate their birthright, *contemplation*. "The tech companies," argues Foer, "are destroying something precious, which is the possibility of contemplation. They have created a world in which we're constantly watched and distracted…Their most precious asset is our most precious asset, our attention, and they have abused it" (8). It is all the more urgent, in the face of such dire circumstances, to stubbornly clarify and promote the indispensable role of critique in technically fortified learning culture.

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The above-mentioned developments signal a new historical mission for universities to deliver, manage, and produce information, in many cases betraying the spiritual and idealistic slogans--usually in Latin opaque to both students and their professors--which adorn their buildings. Even in the humanities and social sciences, whose disciplines are escaping book culture as fast as they can to please customers and forestall declining enrollment, pedagogy looks increasingly like media management. (At a recent international conference I attended, my presentation was the only one among several dozen delivered in a designated venue that did not use PowerPoint.) Philosophical critics such as Erich Horl (2015) attribute such conspicuous but hardly newsworthy incidents to the "technological condition," a phrase that supplants the quaint catchphrase *human condition*, and which epitomizes the exteriorization or exile of humans since childhood into a technical apparatus that, as least for digital natives, captures their attention and *informs* them of, if not *forms*, their humanity, that is, how to *act human* (or, arguably, *post-human*) according to millions of fleeting online examples that are mostly algorithmically foisted as contemporary, in the living present, where obscene profits are to be gained from popular culture. There are more than 50 million web sites, 75 million blogs, and countless films and video games gushing a torrent of behavioral *examples*, icons and images that flood young minds (Jackson, 2008, 13). But no behavioral *exemplars* emerge from this maelstrom except those valorized by local discourse communities and commercial enterprises as trending, such as Kaepernick's boycott of the national anthem, Beyonce's birth of twins, and Taylor Swift's lyrical turn to the dark side; and those singled out in newscasts as newsworthy,

such as Harvey Weinstein's predatory history, Donald Trump's delivery of paper-towels to Puerto Rico, and the mass shooting in Las Vegas.

Young minds possess no inborn criteria (e.g., moral, aesthetic, epistemic) by which to filter and rank the images and trends that engulf them, so where do they learn such criteria? With book culture of diminishing significance to digital natives as a group, and personal book reading in decline among teens, one has to assume they learn criteria of taste and judgment during the six hours a day they spend engaging with nonprint media content (Jackson, p. 18). But what about their schooling? Everyone knows that teachers inculcate knowledge and skills according to curricular mandates, and do not teach criteria of personal excellence, nor build character and nourish souls with dialectics, as did Bronson Alcott in Concord, Massachusetts. But trust in the internet has given new hope to the most disillusioned educators and parents that Ted-Talks and podcasts by intellectual celebrities will be absorbed by students (via divination or serendipity?) as they browse the web, making them outstanding citizens. It is more likely that the most *commercial* mode of learning prevails, namely, through consumption of trending cultural artifacts and experiences (Disney, the *Harry Potter* series, *Game of Thrones*, Olive Garden, etc.). These, and not schooling, nor books, are the sources of our humanity in the 21st century.

The nearly bygone norms of intellectual and religious experience that traditionally cultivated and inculcated criteria and standards--including role modeling--on a personal basis via tutors, mentors, sages, and saints, along with philosophical and literary works demonstrating aesthetic taste, critical selectivity, self-discipline, moral deliberation, and metaphysical struggle, those norms and narratives now remain largely sequestered in book culture with a sort of archival status of marginal significance to digital natives, who perceive anything published more than 30 years ago as old-fashioned. The hegemony of the living present as the fundamental temporal dimension of digital natives reveals itself in the intense *Verfremdung* or disorientation experienced by today's English majors reading *The Mayor of Casterbridge*, and in the fact that none of them have read Augustine's *Confessions* while autobiography is all the rage. Even digital natives with tenure-track positions in composition studies have never read or heard of Augustine's *On Christian Doctrine*, a sort of under-the-radar rhetorical manifesto and treatise on exegesis. Although one could argue that some of the writings of Petrarch are available on the internet (along with secondary literature, biographical information, and so on) for any student to discover, neither algorithms nor memes nor trends will steer a curious cohort to an historical source that has not been listed as a best seller; associated with a celebrity scandal; cinematically depicted and branded for profit, such as the films made of Jane Austen novels; or transposed into a video game. Enormous swaths of historical and literary content may now be available on the internet, but much of it is fatally associated with book culture, never to be transposed into entertainment media controlled by FAANG (Facebook, Apple, Amazon, Netflix, Google). It would take a small miracle of divination or serendipity for an alert student to find, say, Petrarch's *Secretum*, published by an obscure outfit called Hesperus Press, unless it was "trended" by a FAANG outlet or interface. (Sometimes I think that the "indie" and small presses are the proverbial finger in the dam that prevents our inundation by hi-tech barbarism.) In the global system, consumption of and identification with FAANG products and the apps, networks, and films to which "it" (as a collective pronoun) provides access, "humanizes" and "cultivates" those whose capacity for selectivity remains undeveloped with a flood of information, introducing them less often to luminous ideas than self-published mawkish romances, fantasy sagas, serialized syncretic mixes of ancient myth, gruesome and

spectacular video games, or narcissistic pictorial displays on Instagram. Such commercially produced materials, downloaded and experienced via smartphones and iPads, replace grassroots enculturation and education as traditionally understood, such that even in the classroom, as we will see, bonding with hi-tech brands is integral to the so-called learning process. Most parents have no problem with this order of things so long as diplomas are granted; in other words, they are indifferent whether their Kyle or Katie encounter *Flowers for Algernon* in a paperback, Kindle, smartphone, or in either of the two cinematic versions available on DVD or via Netflix. Anyone who argues that this description is too harsh, and that young people surely become humans through intimate and sincere "quality time" with books, family, friends, and teachers, ignore the fact that access to these social phenomena is often through experiences mediated by FAANG.

While it seems too early (and yet feels too late) to be decisively for or against the technological condition, it has enabled even the far-flung institutions, such as the University of Guam, to adopt digital devices in the classroom and study their impact on teaching and student learning outcomes, as the work published in *Micronesian Educator* confirms. Yet it has caused me some discomfort that the dissemination of critical thinking has not experienced anything like the headlong momentum seen in the buildout of digital infrastructure across the planet. I like to think that if consumers and educators were critically aware, there would have been more scrutiny, selectivity, push-back, at least in isolated pockets of resistance, amounting to *thoughtful delay of the inevitable*. The advantage of widespread popularity has made the digital Leviathan all but impervious to critique. Critics lack the branded charisma of exquisitely designed gadgets; nor do they have the deep pockets of the titans of hi-tech who entice students in strategically designated school districts with their products, instilling brand loyalty in classrooms that double as showrooms. In many cases students and teachers are already past the stage of indoctrination, being genuine devotees of products by Apple and Google. With so many users charmed in their private lives by the seeming indispensability of the newest digital trends and apps, it is easy to forget that the exigencies of formal learning are different, public requirements are different, and we must critically govern the aforementioned variables according to local needs assessment, research, curricular mandates, budgetary strictures, and not least in importance, principles and priorities derived from critique--the latter too easily squelched by enthusiasm, the emotional vector that most commonly handicaps thought in high-tech devotees. As Franklin Foer (2017) says of consumers spellbound by gadgets, "We've spent too long marveling…The time has arrived…to reassert our own role in determining the human path" (p. 3). Here I am reminded of an instructor who, personally enchanted by his new Kindle, stopped ordering required texts through the campus bookstore, and strongly urged his students to download them on Kindles and smartphones, although research shows that, particularly for the disadvantaged, book accumulation at home (real books on bookshelves, but fine on the floor, or in the car!) quickens literacy in outsized ways, often with collateral gains for siblings and family members (Minkel, 2012). Now, the instructor who loves Kindles was hardly guilty of elitism, since if anything he sought to democratize access and save students money with his digital conversion; but he lacked critical foresight regarding its long-term impact on domestic patterns of literacy among the underprivileged. In any case, he would be justified in maintaining his position on the grounds that extant research is not nuanced enough to prove that a collection of books at home is less or more intellectually beneficial to the inhabitants than a Kindle or Nook. I wonder if he

anticipated student comments like the one I recently overheard uttered by a Kindle devotee (and English major): "Books are a real pain to lug around. I'd rather not."

My line of argument emerges tongue-in-cheek from this evolutionary emergence of bookless English majors (themselves future teachers) almost as their conscience, for I modestly seek to persuade fellow educators to carefully weigh decisions about new technologies that incite or accompany unprecedented changes in cognitive styles, cultural attitudes, and practices—such as English majors who loath carrying books, and who prefer reading short stories and comics over novels—indeed, for whom being assigned novels over 300 pages (except those by Stephen King) elicits a grimace typically associated with someone receiving a sentence of ten years hard labor. Is this "less is more, briefer is better" ethos of students, is this cognitive style of *scanners* and not *readers*, is this the scholarly *habitus* and persona we valorize and target as a long-term learning outcome for our app-savvy English majors? *Wrong question*, says a colleague known for his wry cynicism; *we teachers are not concerned with shaping the character and consciousness of, say, a scholarly soul*; *we only teach skills and deliver knowledge conforming to curricular standards, and compatible with trending methods of short-term learning assessment*. *Besides*, he continues, *the "shaping" of consciousness of which you speak is primarily done by the wider culture, itself spellbound by social media and all things digital; teachers like us will not alter this technically overdetermined situation one way or another*.

But of course effective teachers *do* shape character and consciousness whether they admit it or not—all students being *lifelong learners* in their eyes; which is why, if the spirit moves them, they should teach great but lengthy novels such as George Eliot's *Middlemarch* or Tolstoy's *Resurrection*, in which character development and moral struggle are so profound as to leave a lasting impression on the young mind that exercises the patience and attentional focus to read them. Such resistance to current trends favoring brevity and convenience favors the *long view*, instilling attentional habits, advanced literacy, and a capacity for moral insight that benefit the student for years to come. Digital advocacy in the classroom, intended to please students while streamlining and economizing learning practices, should not allow temporary enthusiasm to overlook or underestimate long-term changes in habits of attention and patterns of cognition that disempower focused learning and literacy. Even something as common and useful as PowerPoint inculcates a habit of oversimplifying issues whose complexity should not be taken as a nuisance, but a challenge worthy of serious thought and discussion (Jackson, 21). The disorienting *Verfremdung* experienced by my undergraduate readers of *The Mayor of Casterbridge*, who find themselves in a remote historical setting and discourse among characters whose moral dilemmas nevertheless remain worthy of comprehension in 2017, is conceived by Paul Ricoeur (1981a) as *distanciation*, or productive alienation (140). He means that the historical distance evoked by Thomas Hardy will never be entirely overcome, but in the hermeneutic struggle to do so, to grasp issues and behaviors from a former cultural epoch, my students have an authentic learning experience. Teachers who protect their students from such exegetical struggles by merely showing the BBC televisual rendition of Hardy's tragic novel thwart literary cognition, encourage intellectual immaturity, and disempower students who might encounter similar moral dilemmas and textual profundities later in life. Reading is a *way of life* that builds attentional perspicacity in body and soul (Illich, 1993, p. 59), and if reading skills are refined and empowered in our classroom efforts, student by student, book by book, we prepare them not

only to excel in short-term performance outcomes dear to assessment officials, but to understand and enjoy all the rich complexities of a life lived attentively.

Most teachers, tasked with myriad curricular mandates, are preoccupied with assessing short-term learning outcomes, such as effective thesis statements in an essay, all but ignoring dramatic deformations in civil discourse, modes of respect and courtesy, and attentional life evinced by their students on a daily basis. It might not even occur to them that a historically significant decline in book reading among their students, measured on a national scale, is to no small extent thwarting their efforts in writing, and, combined with their digital habits, contributing to their attentional disorders and disrespectful unruliness. The remarkable soul-enhancing and civilizing effects of medieval book culture detailed by Ivan Illich (1993) suggests that book reading can have a disproportionately positive influence on personal development. Due to the interwoven, prosthetic nature of web-based devices, whose effects are structurally immanent to the consciousness of digital natives, when we adopt a new technology or software app in a school system, it is not the same as updating a tool for learning, such as replacing chalkboards with whiteboards, but has a far-reaching *field effect* that could be counterproductive to effective teaching and learning that *cares* enough to inculcate attentional discipline and retention of specialized skill sets and knowledge that will serve students for years beyond graduation.

When we change the mode of access to literature and read on a Kindle with browser, this ultimately transforms the epistemology of reading and literary understanding, and thus the entire practice of literary studies and language arts. The physical distinctiveness of a novel in hand, whose sensuous totality, like a cosmic portal or time machine waiting to be activated by focused attention, separates its holder from everything else around him or her as a possibility of transcendence, a condensed sociohistorical adventure beyond the trendy shallows of the living present. This incomparable possibility becomes, in an iPad, just another downloaded file competing for our attention in a swarming chaos of music, news, photos, films, advertisements, incoming text messages, tweets, and so on. The paperback novel in hand interactively *demands* of and *imparts* attentional focus to its reader like a world of one's own—or a room of one's own--as the act of reading progresses; and, as Virginia Woolf argues (1932), reading demands "the rarest qualities of imagination, insight, and judgment" (244). My focus is not dissipated or distracted, but sharpened, and the visual and acoustic effects of the words I read are, according to John of Salisbury (2009), a sort of "verbal intercourse" that introduces "wisdom both through eyes and ears," and the understanding that is facilitated by the act of reading is like "the hand of the soul" (38). In her own way Virginia Woolf concurs with the medieval scholar that attentive reading (characterized by focus and solitude) is as it were a resource of the soul, if not one of its ontological sources, along with prayer and contemplation. Again, book reading shields one from the trends followed by herd behavior, from everything swarming electronically. In other words, over time the habit of focused reading establishes or institutes within the reader not only an integral center of awareness and moral conscience, a command center of consciousness which for lack of better terms we can call "soul," but the private fortress or inner citadel that shields and shelters it according to ancient Stoicism (Hadot, 1998). As I read, my soul feels intact and sentient, not swept away in distraction by text messages and tweets. To repeat an observation made earlier, when we swap books for Kindles, or watch the impressive film *Last of the Mohicans* instead of reading the verbosely romantic novel by Cooper, authentic literature and literary experience do not remain unchanged in some Platonic dimension of ideal forms to which we can

have recourse when whim dictates it. Even if physical copies of the novel remain in print, our digital habits of attention will not provide us comprehensible access to that version, but only to the digitized or cinematic version we experienced in high school. Phenomenology has long taught that the mode of access to an experience or object is co-constitutive of that experience, that object; hence, hiking a steep trail to a craggy summit yields a *different mountain* than driving there by car. Likewise, new devices and apps that are meant to expedite or enhance learning experiences such as reading, reorganize those experiences in the field of consciousness that processes them, transforming them into utterly different styles or patterns of cognition that may not empower and individuate the soul and its inner citadel, but disperse them into diffuse patterns of identity and knowing mediated by social media and digital networks—a disturbing psychosocial outcome described by scholars such as Stiegler (2015) and Gardner (2014), as we will see in a moment.  Teachers cannot assume that identity and organizational skills, cognitive and otherwise, are inborn; the tools and materials for learning either scramble one's developing powers, manipulate them commercially, or inculcate habits of focus and selectivity that, when repeated, facilitate later acts of discrimination that give stability and coherence to experience (Gurwitsch, 1964, p. 33).

For the reasons given above, I do not hesitate to advise new teachers to adopt a sober critical attitude regarding new instructional technologies regardless of their personal fondness for them. There are teachers and administrators who, in rare agreement over spending priorities, make the sales reps from Apple and Google feel like family. Although the sales reps used to openly brag, "Our products sell themselves!" or "Our customers are our best salespeople," they now keep these thoughts to themselves for fear of losing their jobs. In such a tech-friendly setting, it is uncommon for some critically aware faculty member to stand up at a division meeting and, waving a paperback copy of Jaron Lanier's *You Are Not a Gadget*, exclaim, "Excuse me, but are our technology needs really the same as the schools in Chicago? With a *Google here*, *and a Google there*, *everywhere a Google*. Is that the ditty we find ourselves singing under our breaths on the way to campus? If we haven't figured out how to teach effectively yet or get our students to read and listen, to really pay attention, what does it say about us that we so readily outsource the challenge to technology? I say we pump our limited funds into a Center for Teaching Excellence!" One can only imagine the quizzical, slightly amused glances of his colleagues, most of whom delicately fondle their smartphones as he speaks. They know that except on the wealthiest campuses his idea doesn't have "a snowball's chance in Hell."

Anyone who follows the news knows that recently the critic has been painted as a clown, the village idiot. In his first commencement address as president, Donald Trump said, "Nothing is easier or more pathetic than being a critic."  Rarely courted due to its sharp edge, and even more rarely monetized, the critic's métier, critique, is the wallflower at the party where research gets the attention of wealthy suitors, a.k.a. funding agencies. At its etymological roots, where *krinein* connects to *krisis*, critique involves acts of distinguishing, judging, sorting, and selecting that resolve a crisis of decision or conflict of interpretation by invoking a set of explicitly rational criteria (Gasché , 2007, pp. 21-23). It poses questions dialectically to confirm authenticity, to check if what passes for knowledge is only opinion lacking evidence-based justification. As Foucault (1985) points out in a compelling lecture, critique can be traced back to the practice of textual exegesis among heretics who sought a more accurate scriptural basis for their religious practice than was espoused by Church dogma. "Let us say that critique is historically biblical" (385). The heretics, who broke out into various sects, some hiding in the mountains, signaled a

return to close reading of the Scriptures to clarify their truth, to let them speak on their own terms, as opposed to the Vatican's manipulations of doctrine to secure its far-reaching power and influence. In another epoch, this situation could be a healthy, not perilous, conflict of interpretations that provokes meaningful debate. If we use our imaginations to link their efforts to secular modernity, heretics are early precursors of linguistic and evidence-based critique that hermeneutically distinguishes the authenticity and purported truth of documents and their factual sources from sham substitutes and hearsay.

In the early modern era, the fact that critique was lifted by Marxists from the pages of Kant and Hegel and radicalized into *critique of ideology* should not deter us from recognizing its current pertinence as a force to question and clarify the possibilities and pitfalls of global technical hegemony. Although Ricoeur (1981b) convincingly argues for the continuing relevance of critique of ideology as a mode of interpretation, its radical legacy has unfortunately stigmatized critique *per se* such that the term has fallen out of common usage, even among professors who advocate critical thinking. It is curious that a twenty-three-page booklet by Paul and Elder (2009), a sort of user's guide to critical thinking widely distributed on college campuses (including my mailbox at University of Guam), *entirely omits* the term "critique," the engine of critical thought. As cynical as it sounds, one wonders whether by publishing such a copacetic version of critical thinking, the authors sought to boost sales among college administrators and corporate leaders making headlines for espousing the virtues of critical thinking. In any case, thinking that deserves the modifier "critical" cannot, without disarming itself, disavow its birthright of critique. It was the Marxists, after all, who first critiqued commodity culture and the reified consciousness of consumers who equate *having* (say, a Gucci handbag) with *being*, if not with *virtue*. This is a far cry from Platonism, which associated *knowing* with virtue, and from Cicero's defense of *eloquence* as virtue. Who would deny that when hi-tech consumers compulsively purchase the expensive, updated version of their smartphones or laptops on an annual basis, they are not also updating their social status and complying with the ideology of built-in obsolescence? In such consumers, two commercial ideologies overlap in fetishistic modes of *having is being*, and *new is better*. To which I say, "To each his own," so long as this uncritical behavior does not infiltrate educational institutions.

The global outbreak of branded hi-tech consumerism, particularly among digital natives, is characterized by an aesthetic appreciation of product design that encourages brand loyalty, making ownership something *passionate*. One's dependency on the technology is reinforced by feelings of affection, making it ever more difficult to "break up" with the gadget or interface, which already sets obstacles to cancelling membership. Such passionate feelings can interfere with one's critical capacity to make objective decisions when conducting technology needs assessment, or worse, such feelings can turn all efforts at student needs assessment into technology needs assessment, as if the only way to deliver quality learning, the only way to productively engage young minds and souls, is through technology. This "turn" is ideological, underpinned by an uncritical belief in the magical power of technology to pull our educational systems out of their dysfunctional spiral. The interlinkage of life and technical gadgetry becomes so tight that, even when the product or service rises against us, as when Facebook is manipulated by Russians to influence the presidential election, we find an excuse to stay with it and not break off relations. "Most of my liberal friends," writes Micah Sifrey in *The Nation*, "confronted by the evidence that Facebook was used to meddle in the election, still can't find the energy to quit or stop using the platform. Online organizers, who arguably have more awareness of the problems with Facebook, are

equally committed to sticking with it, because 'that's where the people are'" (2017, Oct. 12). By not breaking relations with such interfaces, we quietly condemn ourselves to living in bad faith, muttering "It can't be helped!" or "What else can I do?" In general, there is an increasingly seamless integration of technology with our lifeworld and what Husserl called the *natural attitude*, that amounts to its colonization by GAFA (Google, Apple, Facebook, Amazon) or, if you prefer the more capacious acronym, FAANG (Facebook, Apple, Amazon, Netflix, Google). Critics and philosophers such as members of the Tiqqun Collective (2012), themselves reliant on certain devices like the rest of us, struggle to establish perspective, to temporarily disengage from their own wired involvements with the sole aim of freshly describing the ideologically determined materialism, the reified and fetishistic compulsions of digital natives whose technical conditioning and brand loyalties feel entirely natural to them. This natural feeling of connectedness ("The first thing I do when I wake up is check Facebook and Instagram!"), akin to the dawn smile that the sunrise elicited in earlier generations, testifies to the remarkable effectiveness of ideological determination. It is natural for those born within the digitized lifeworld to feel spellbound by consumer trends in social media, patterns of speech and dress, images of bodies crafted by celebrities on the internet, and so on. This is why, for these digital natives, our students, developing a capacity for critique is at once terribly difficult and terribly important. Only by doing so will they discover their servility or unfreedom, then gain the distance, sobriety, and intellectual lucidity required to effectively position themselves for self-determination, and to become masters of the technologies that presently engulf them. Perhaps "masters" is too strong a term; "critics" seems more apt. The ironical challenge for the digital natives is to develop a capacity for critiquing the technological condition to which they owe their human consciousness, which means, as Kant conceived critique, to make distinctions that define the limits and possibilities of the human relation to technology.

Given such contemporary developments, it seems inarguable that although times have changed since heretics risked their lives establishing the textual accuracy of the scriptures, critique remains indispensable in an era of informational overload and the continuous roll-out of digital gadgets to captivate consumers. Basic, down-to-earth examples of critique from daily life abound, as when works of art are singled out for praise by judges for their aesthetic merit and originality; when a prospective car buyer ignores commercial slogans and performs due diligence by reading detailed reports and test driving cars; and when a student writing a research paper rejects a bogus web site in favor of a reputable source of information. In such situations, critique "cuts" and separates the object or achievement that meets its criteria from the glutted backdrop that threatens to occlude its distinction. For educational leaders, it is a critical way of thinking and questioning guided by a set of principles derived from one's philosophy of education, which establishes and protects the conditions for the possibility of realizing its concept of an *educated person*. Most academically inclined people generally agree, for example, on the need for principles of academic freedom and evidence-based inquiry in a space that maximizes opportunities for self-determination, historical understanding, and enculturation. Other principled behaviors, such as firm support of foreign language study or vocational training, should be critically adduced not from trends, but from the unique vision a university has of itself and its students. In any case, when it comes to digitalization and technical development, it is too often the case that uncritical enthusiasm overrides philosophical principles and critical thinking, as we will see in a moment when we consider the Googlification of entire school districts in Chicago and New York.

The novelty and convenience of digital apps keep users enthralled as happy consumers solely attuned to the upside delights of their captivation. This captivation has been rigorously analyzed as leading to widespread addiction (Alter, 2017) and distraction (Jackson, 2008). Nicholas Carr (2011) reports numerous cases of Kindle users who used to be diligent readers of novels, but who become so pleasurably distracted by the browsing possibilities of their digital reader that they fail to finish the novel they downloaded, their deep reading capacity split and rerouted into the shallow jaunts of "a little bit here, a little bit there" they once reserved for magazine and newspaper reading (p. 103).  At least these adults have a capacity for retrospection which enables them to distinguish changes in their habits of attention. (Yet their awareness lacks a critical edge. When it is suggested that their episodic and piecemeal cognitive style is shared by the current president and the many voters who elected him, they cringe in denial that such an attentional disorder is common to all political parties, to most habitual users of digital media and reading devices in both "blue" and "red" states.) So-called digital natives, on the other hand, lack anterior experience that enables the retrospective pivot necessary for assessing patterns in quality of life and literacy before and after the digital revolution. They are like amphibians steeped in continually refreshed aqueous splendor, only dimly aware, via ancestral lore, of terrestrial modes of existing that offer more autonomy but less convenience. In short, there is little incentive in the digital *Spielraum* to establish a life elsewhere while most digital natives have an entirely positive take on technology. All the more reason for critique, whose dialectical antithesis brings a contrasting perspective that awakens one from the stupor of habitual comfort. The truth of a matter includes its backside, and when yet another student praises the empowering virtues of social media in an essay, the cogency of her essay depends on confronting shame culture, trolls, and fake news, all likewise empowered by the web. Yet the alarm bells that are rung in critical works by Bernard Stiegler, Howard Gardner, Jaron Lanier, Sherry Turkle, and Nicholas Carr, go largely unheard by digital natives. Stiegler (2011), the most critically trenchant of the group, who is particularly concerned with the hive mind or "groupthink" characteristic of digital natives, speaks of app-induced "herdish hyper-synchronization" by which digital natives think and act in unison, becoming ever more "disindividuated" (p. 43). The result of this herd-like behavior is that each person's subjectivity is diminished, resulting in the "endless role diffusion" reported by Howard Gardner (2014) that destabilizes and defers, often for many years, the self-determination of young adults (p. 32).  Who reads about such inconvenient truths when they can tweet their friends while simultaneously watching Netflix and playing *Call of Duty*? Who the heck wants to learn that new digital systems and devices, once adopted, mediate and alter the discursive norms and practices of subsystems called discourse communities, that they are likely to addict many users, thwart their individuation and maturation while intensifying their sociality, and inhibit their risk-taking in everything from creative writing to career selection? Unless the above mentioned critics are assigned as homework, few students will consider the possibility that retrofitting classrooms with technical appliances that teachers and students are urged to integrate with instruction and learning, replacing books with Kindles, moving the teaching evaluation process online, and mandating the conversion of extant courses into web-based platforms, amount to technical forms of dependence that influence personal conduct as much as the delivery and communication of knowledge. Such sweeping gestures of governance, of administrative policies installing governing technologies, produce and mold specific types of learners who, in Howard Gardner's terms, will be either app-enabled or app dependent.

Rather than create a learning environment designed to provide the highest quality teaching and learning, one that is distinctly critical--hence selective--in its governance (adoption and placement) of digital media, most universities conform to domestic and corporate patterns of digital infiltration. There are many reasons for doing so, but I will mention two that seem primary. First, since the needs of the customer always comes first, the learning space that she pays for should comfortably overlap with the milieus to which she has become accustomed at home and work, congested with technology, to sustain her habits and not prompt cognitive dissonance. The idea that such dissonance or discomfort is integral to intellectual growth, which overcomes difficulty by becoming familiar with its source and mastering it, contradicts the logic of convenience and the ethos of customer satisfaction that govern universities. The last thing administrators want is to be flooded by irate calls from parents because their kids cannot recharge their smartphones in the lecture hall or obtain wireless access in the classroom. Secondly, with college education now narrowly conceived as vocational preparation, and not intellectual self-determination (which may or may not issue a vocational imperative), the technical infrastructure on campuses should mirror the hi-tech setting of the workplace to optimize the efficient and timely "fit" of the college graduate to her eventual place of employment, and, it follows, quicken productivity by avoiding the "downtime" of old-fashioned employee training programs.

These conditions convince me more than ever that a university should establish an *alternative ecosphere of learning* that contrasts, in its atmosphere and infrastructure, with the domestic conditions that provide a comfort zone for students before enrollment. But this concern, due to the institutional challenges that confront it, will only strike readers as hopelessly utopian until its details and logic of argument can be developed in a convincing essay to be published at a later time.

With so much money at stake in technical expenditures on campus, the possibility of inhibiting opportunities for freedom of thought and expression on campus rarely occurs to administrators and system overseers who are *already certain* of the advantages of technology. But is this certainty grounded in objective, evidence-based knowledge, or does it issue from anecdotal lore of colleagues, trending hearsay, or personal enthusiasm arising from the successful adoption of technologies in private life? Do teachers and educational leaders base their planning on the flawed logic that what is good for oneself is good for all? This sounds extreme. But as I mentioned earlier, I know of a reputable teacher who, absolutely enthralled with his Kindle, stopped ordering books at the university bookstore with the expectation that his students would henceforth reap the benefits, pecuniary and intellectual, from the cost-effective convenience of downloading required texts on Kindle. I am aware it is the bibliophile in me that cringes before such sweeping, well-intentioned decisions. My own childhood experience, and later, that of parenting, convinced me of the value-added potential of having real books abundantly in reach of inquiring minds as they develop. The accumulation of a library in the home, consisting of all sorts of titles including personal favorites, reference works, dictionaries, and former schoolbooks, is advantageous to students growing up in its vicinity; their progress in literacy, research shows, far exceeds normative standards and expectations (Minkel, 2012). Although the research is convincing on this issue, I prefer the frankly nostalgic tributes to childhood library access penned by distinguished novelists, philosophers, and scientists such as Dostoevsky, Virginia Woolf, Margaret Fuller, R. G. Collingwood, and Norbert Weiner. While the intentions of the colleague I mentioned who steered his students from books to Kindles are surely above reproach, they are also arguably short-sighted, failing to see the indirect long-term benefits,

both personal and communal, of the impact of book accumulation on the epistemic ecology of learners. Unlike my students, whom I encourage to keep their books, his students will not bring books home where a sibling can randomly pull a title off a shelf and, in so doing, eventually blossom into the next José Rizal or Virginia Woolf.

Good intentions sometimes pave the way to…well, you know the adage. Several years ago, the university where I teach abruptly transitioned from a prescheduled, mandatory teaching evaluation process conducted in classrooms on paper, to a voluntary online procedure. So far, the number of participating students has dropped off sharply. In theory, the paperwork-reducing convenience of online teaching evaluations is obvious, as is the additional security; but in practice, glitches in password renewal and log-in procedure have discouraged participation in one of the few consequential venues for student opinion. In theory, the access-anywhere convenience of the online process makes good sense, but in depending on voluntary use of time outside of class, it overlooks the frantic work and study schedules of students, who would simply prefer to "get it over and done with" while on campus attending classes. Put plainly, they would rather have the evaluation process scheduled for them on site, such as in the computer lab. Obviously, what is convenient for some parties, e.g., administration and staff, is not for others.

If critique were integral to planning, it would not so much question the specific decision to go online and its technical glitches, which can be fixed, but the logic of convenience which the decision presupposes. In its overseeing role, critique distinguishes and conceives limits--the right measure--for plans and policies that influence the ecology of student experience, such as decision making based on the presumed convenience of trending technologies. The nuances of such an ecology can be easily overlooked and lead to difficulties without sufficient critical oversight. If, for example, student learning quality and freedom of self-determination are critical priorities, as they should be, a conundrum arises when students demand freedom to use smartphones in the classroom. In this situation of a clash of freedoms, where a student demand (freedom to use phones) contravenes the conditions necessary for undistracted learning (freedom to learn undistractedly), critique adjudicates not by affirming the personal preference of either the professor or students, but by citing objective research which discloses evidence in support of one or the other party's preference. In this regard, research studies show that smartphone use in the classroom, with students using their phones as much as eleven times per day in class, not only impairs the user's learning, but that of his neighbor, who suffers collateral distraction. This finding had already been anticipated by research on multitasking, which shows a degradation of task performance as the number of tasks increases. According to Brenner (2015), research at Harvard found that, "Those who texted frequently took lower quality notes, retained less information, and did worse on tests about the material." Another study (Kuznekoff, et. al., 2015), which compared the academic performance of those using smartphones in class to students without smartphones, found that the latter scored 70% higher on recollection tasks, and 50% higher on note-taking tasks.

If the dignity of logical argument and evidence-based research are respected on campus, and not sacrificed to consumer trends and personal whim, then the use of critique to adjudicate controversies, such as the one mentioned above, should be effective in protecting the ecology of student experience. In response to the question, "Can we use our smartphones in class?" the answer is, "No, the research proves that would be counterproductive. Let's look at the research, so we know where we stand in principle, and

why." The outcome is an objective resolution of the antinomy between individual freedom based on whim, and the overriding freedom of all students, based on principle, to undistractedly optimize the time and quality of learning. A casual syllogism can confirm this outcome. (1) "Our goal is to achieve the highest quality teaching and learning possible." (2) "Research shows that the use of smartphones in class degrades the quality of learning." (3) "Therefore, we will not use smartphones in class." The point to be underscored here is that it is critique, and not administrative fiat, or blind faith in technology, or Luddism, that adjudicates problems that arise, as they most certainly will.

In the context of institutional planning, critique is "the art of not being governed so much" (Foucault, 1985, p. 384). Alas, Natasha Singer (2017) reports that school districts in Chicago and New York have undergone total Googlification, a process whereby schools "targeted" for Google funding have all learning and instruction mediated by Google Chromebooks and apps, with pedagogy so integrated with Google software that teachers claim they "cannot think without it." In such a system, the responsibility of governance has been passed to Google. While elsewhere, in my classroom in Micronesia, technology is supplemental, as when, to save on paper costs, I distribute by email a PDF file of Kant's essay, "What is Enlightenment?" to my composition students in preparation for their argumentative essay assignment. This mode of file transfer, which can also be done via Google Docs, Moodle, or Drop Box, is at any rate more advanced than the paltry and impermanent journal, *Berlinische Monatsschrift*, in which Kant and his interlocutors argued about the meaning and purpose of enlightenment. Yet it is not as if Kant's selfsame essay can be ranked *good*, *better*, and *best* as we ascend the developmental stages of technical media from newsprint to Drop Box that deliver it. The Kant essay is always thought provoking and worthy of our critical attention, even in a crumpled hardcopy found in the back seat of your car. If we stop fussing over media and grasp the message, clarify Kant's argument and concepts as they were espoused in the charged atmosphere of 1784, five years before the French Revolution, the quality and rigor of the ideas that Kant and his colleagues exchanged in a public venue continue to engage us, and they do so because of their quality and rigor, not because they appear in Google Docs or Drop Box in a Kindle. It is those ideas with which my students and I grapple, agree and disagree, that productively burn up the hours of learning, and not the hi-tech gadget that will project them on the wall behind us in panoramic technicolor if we can operate it without delays and glitches. In this learning context, the exegetical concentration we have mustered is our forum, fortress, and force field, and I do not know how it would assist or enhance our intense discussion of Kant's essay by using PowerPoint, or if the classroom were suddenly retrofitted with Chromebooks and governed by Googlification, since even a smartphone ringing or a door shutting strike us as unwanted disturbances. What *does* enhance our discussion is Robin Schott's essay, "The Gender of Enlightenment" scanned into a PDF file and shared by email. In Schott's critique of Kant's autarchic concept of enlightened reason that upholds the sovereignty of the individual mind, Schott (1985) shows how the imperative to "have the courage to think for yourself" handicaps progressive reasoning by excluding a woman's more community-based imperative to think as a family or social body. What do we have without total Googlification? There is Kant's essay and its critical interlocutors, past and present, and us, and that is enough, and all of it stimulates critical thinking and rigorous argument. How do I know? I have student essays to prove it.

Although I find myself continuously energized by the no-frills, low-tech challenge of teaching Kant's essay to composition students, who seek to clarify its logic of argument, critically understand and

express in writing its historical role, and argue for or against its significance for their own time, their own lives, I appear a bit of a laggard beside colleagues who use Moodle and MOOCs, who have won grants to replace books with Kindles. So, I wonder: would students using Moodle and smartphones and PowerPoint understand Kant more rigorously than my students? I think not, but can say no more without comparative learning assessment data. Bring it on! And do so before you invest the bulk of your budget in a digital wonderland. Lest you assume that my students are disadvantaged, I would insist to the contrary that in the robust interval of our technical minimalism we are not waiting to be saved by Google and Moodle, that we optimize our freedom *to get on with it* and *focus on the matter at stake*, *exercise historical awareness*, *interpret documents*, *argue*, and *practice critique*; and that likewise, a university should optimize the leeway, the "pause that refreshes" afforded by frozen purchase orders and budget cuts, as an opportunity for self-determination through critique. This is the other, less mentioned struggle for self-determination on Guam, against technical and not geopolitical hegemony. As we stand in the path of inexorable change, the power of individual choice for institutions, which moment by moment is gradually overcome by the sheer momentum of compliance, lies in their ability to control the pace, content, and quality of technological transformation by assiduous critique. The mandate for this mode of action was long ago stated by Kant (1985): "Dare to know! Have the courage to use your *own* understanding!" (58). In addition, permit me to add as a teacher: "Stop waiting for digital devices to save us from the challenges of teaching digital natives. Appeasement through comfort is not a critically informed solution. Let us consider, through rational argument, alternative ways of improving our teaching and the quality of learning besides outfitting classrooms with technical innovations.

Surely the first phase of exercising control over the pace, content, and quality of technological change in the classroom is critical evaluation and assessment, via research, of the effects of technical devices on cognition, memory, literacy, and study habits; on modes of argument and elements of logical expression, including grammar, sentence construction, diction, and punctuation; on the capacity for judgment and decision making; on intellectual and moral development, including the adoption of role models; and, arguably most crucial but most difficult to assess, the impact of technical devices and social media on student self-understanding and self-determination. We are laggards in initiating these projects, partly because so much time is spent promoting and installing technical products whose effectiveness remains unassessed. If we look past his penchant for ambiguity, Gardner's recent book (2014) on the psychosocial effects of apps on digital natives is an example of basic research from which other, more focused projects can be developed that pertain to classroom practices. The explosion of online learning has made it difficult for assessment projects to catch up with an overdetermined milieu established willy-nilly without universal (or system-wide) standards and criteria of excellence. We have our water tested before drinking it, and a home is inspected for toxic materials such as asbestos and PVC before we inhabit it; but online learning continues to envelop us without any such certification process. There has been some assessment of comparative learning outcomes among student populations online, in "blended" or hybrid settings, and in the traditional classroom. This initiative, which thus far has produced results in favor of hybrid designs, has seen remarkably few large-scale assessment studies comparing the learning outcomes of different online and conventional practices. Faculty members trained in advanced research design can take on such issues as they see fit, and obtain concrete evidence that critically clarifies,

confirms or disconfirms, rosy if not fatuous assumptions regarding the benefits of social networks, digital apps, and online learning.

But how does one initiate research-based critical inquiry with undergraduate students who are not yet skilled in advanced research design and data collection? One way is to have them pose an argument that requires evidence-based reasoning and clear distinctions. The grounds of sound argument, after all, often comprise the seedbed of good research. Critical thinking in the mode of argumentation not only makes logical distinctions, but distinctions of relative value and significance. In fact, a student assigned the task of formulating an argument starts out by distinguishing between a worthy and trivial argument. This takes practice, but trial and error have their place in the "brainstorming" topic proposal stage of the composition process, which cannot be hurried due to its serious consequences. For example, as a formal exercise we subject the claim, "Apps improve student learning outcomes" to the rational scrutiny that befits sound argument, which requires students to find published assessment data for evidence to justify their claim. That is a more contentious and arguable claim, whose stakes are high, than the one most frequently bandied about, "Apps make learning convenient," which is banal and hardly worth our effort since convenience alone does not necessarily improve learning outcomes. Yet the assumption that convenience *does* improve learning is so widespread that it seems to have become a naturalized truism--an unquestioned claim that disables reasoning. In riposte to this tenuous claim we say, "So what? Fast food is convenient, but it often leads to poor nutrition."

I advise my students that to practice critique, choose a thesis or claim that is both arguable and worthwhile. If they wish to argue "Apps make learning convenient" and not waste the reader's time, they will have to establish the value of convenience in a specific learning situation. Podcasts and Skype are obviously inarguably convenient for learners at remote locations. True enough--a survey can provide testimonies to this truth. But the very obviousness of this example begs the question, "Why bother arguing such a claim? Does it challenge your powers of critique?" I've seen too many logically flawed essays that cobble together the two claims mentioned here with titles like, "Technology Improves Learning through Convenience." I let them pass out of the proposal stage with that title to grapple with the challenge of making such a claim worthy of serious attention. In attempts to argue this claim, often flawed reasoning presumes, in an unstated warrant or enthymeme, that technical convenience intrinsically improves learning. This warrant can be easily refuted. The student who, while cramming at the last minute for an exam, uses the Wiki app on their handheld to conveniently download a summary of Toni Morrison's *Beloved*, is unprepared to perform a close analysis of a passage from that novel whose intricate prose interweaves past and present voices to evoke the ghost-ridden collective consciousness of slavery. When taking the exam, the student is utterly stymied by the passage, which demands a response that demonstrates intimate critical understanding of Morrison's novel—how it works through supernatural and metaphorical nuance, and how its style and structure facilitate the masterly achievement that won her a Nobel Prize.

The above situation is demonstrably a case of app usage that is disempowering, perhaps also an example of app-dependency whose consequences are unclear to the student until a crisis unfolds during an exam. These conditions unmask not only problems of academic self-responsibility, where choices are made on a case-by-case basis regarding the wisdom of short-cuts, but larger forces, corporate and

ideological, that co-determine the *habitus* of the student. In many cases students have been inculcated to trust in the educational value of technologies much as a consumer, swayed by commercials, trusts the integrity of branded products. Such forces were the concern of a student's mother, who saw, in the situation of Googlification discussed earlier in these pages, that her daughter's entanglement with Google devices and software did not just inculcate a skillset for vocational success, but a lifelong branded product loyalty, with her teacher serving as a franchisee of Google products (Singer, 2017). This increasingly common behavior in the classroom is not unlike that of physicians who, courted by giant pharmaceutical companies, press their pills upon unwary patients, often resulting in substance abuse and addiction. Yes, apps are addicting, designed to be so (Alter, 2017).  Again, it is hard to fight the titans of hi-tech, who greedily enter the educational technology "market" with viewpoints that contravene the wisdom of experienced professors. The director of Google's educational apps team does not believe math students need to memorize equations since these can be *outsourced to Google*. Alluding to the quadratic equation, he said: "I don't know why they are learning it…And I don't know why they can't ask Google for the answer if the answer is right there" (Singer, 2017). Since Google apps are being widely distributed in American classrooms, his opinion could have potentially widespread influence over future patterns of learning by disempowering the mnemonic capacity of app-dependent digital natives.

As is typical of the internet era, distinct discourse communities tend to cluster and reinforce their own viewpoints to the exclusion of others, precluding argument.  The worst-case outcome of such uncritical formations was arguably the 2016 presidential election, determined by strategic uses of social media such as misinformation campaigns by the Russians. The widespread problems is when each group's opinions, nurtured in web-based echo-chambers devoid of opposing viewpoints, assumes the indubitable certainty of apodictic knowledge. Such conditions encourage an online milieu in which substitute facts and fallacious information are circulated, often with dangerous consequences. It is a rhetorical commonplace at this point in history to cite the "Pizzagate" incident as an example of the dangers of ideological dupery induced by web-based filtering. One of the earliest incidents of fake news to make the headlines, Pizzagate involved Edgar Welch, a young man from North Carolina who read a Facebook newsfeed that Hilary Clinton was running an adolescent sex-slave ring in the basement of a pizzeria in the nation's capital. He stupidly (but in his mind, nobly) drove there with a rifle seeking to liberate enslaved youngsters, and shot three rounds into the venue before realizing he had been duped.  Like many subsequent cases, his was attributed to gullibility, but the technical conditions of such an event deserve attention. The credibility of the false story was reinforced by the insularity of the conservative web site that fed news to Facebook, which, on Welch's personally tailored account, was filtered to exclude critical opposition, fostering its own free-standing sub-universe and belief system. Hence the meaning and significance of the scandalous article about Hilary Clinton were determined by the protected sophistry of its ideological context. For Welch, *reading was believing*. As Socrates discovered when questioning fellow citizens, opinion (*doxa*) tends to supplant knowledge (*episteme*) and wisdom (*sophia*). Today a biased report, "pure" for being uncontested, is believed reliable information, and this is mistaken for knowledge. But information by itself is not knowledge until it is experienced or critically assessed for evidence to validate it. This is what Jaron Lanier (2010) meant when he said that "information is alienated experience," and that "experience is the only process that can de-alienate information" (28-29).  As a former hi-tech innovator with an insider's perspective, he remains disturbed by the ascension of information and "big

data" to a sort of sovereign status in corporate and academic life. They silently rule over alienated users worldwide whose cognition and lived experience cannot, in the span of a single lifetime, certify, use, or "know" all the information that encompasses them. A global condition of cognitive dissonance and misunderstanding ensues.

As for the Pizzagate perpetrator, to discover the truth about Hilary Clinton he would have had to entertain contradictions (e.g., no historical evidence of Hilary Clinton being a pervert), which he weighed and synthesized in a dialectical process until the scandalous Facebook newsfeed was either confirmed or disconfirmed as corresponding to reality. In this way, he would uphold the correspondence theory of truth whereby a linguistic statement (as in a news item) corresponds to an *actual state of affairs*. Had the young man from North Carolina merely traveled to the restaurant to quietly investigate the scandalous report, as he told authorities, he would have pursued the truth of the matter by reconciling its contradictions, and returned home without trouble. But instead, he adopted a purely biased report as the truth and acted violently on its false facts, firing his rifle inside the pizzeria. Such irrational behavior subverts the Socratic method of learning called dialectics by which an interlocutor questions the confident knower in such a way that what the latter takes as knowledge is exposed as mere opinion. Only when one knows what she doesn't know can she proceed to acquire genuine knowledge and hence a virtuous identity as knower, bearer of truth.

Now, who is to blame, the conveyor of false news or the reader of false news? As educators we should blame Edgar Welch for reading uncritically. The young man from North Carolina did not encounter an online interlocutor, or a philosophical hitchhiker, to disconfirm his absurd belief during his drive to the nation's capital. But he would not need to rely on such chance encounters if he was an active reader, since active reading online or offline presupposes critical explication, which enacts its own interlocution. ("Is this stuff about Hillary for real, or am I being duped by fake news?") Stated otherwise, my college students know that reading is *not* believing, but a process of exegesis involving acts of explication, and that these acts perform the checks and corrections of research (such as ranking and comparing sources for factual credibility) and dialectical questioning that result in either informed opinion, based on both hard and ambiguous evidence interpreted in the language of conjectural inference (as in criticism of poetry), or certain knowledge (as in biographic or bibliographic research). It follows, then, that the young man from North Carolina was culpable of being a passive, uncritical reader. An active reader would have known better, and avoided a troublesome and violent outcome.

The academic community, entangled with digital media as much as other institutions, and unpracticed in critique, is not immune to such media-induced chimerical distortions. A case in point involving students may be instructive here. After a lecture in which I analyzed the historical and psychosocial roots of the recent popularization of zombie themes in film, television, video games, and literature, several students approached me after class. They unashamedly confessed that I was the first person in their lives to disabuse them of their belief in the reality of zombies, and what they had previously feared, with mounting hysteria, to be an imminent zombie apocalypse. The latter issued from government conspiracy theories bandied about online by video gamers, who inhabit an exclusive discourse community to which critics like myself are not privy. Their belief in this urban myth arose primarily from the sheer

abundance of zombie images and narratives to which they had been exposed, most saliently in video games, where computer-generated animation has apparently reached new heights of realism.

This gullible behavior is swayed by numerical superiority. The zombie trend is convincing because millions see it on screen and believe in it. In general, student comments and questions manifest a widely shared blind faith in consumer and internet-circulated trends. For example, many accept without question that technical trends, from reliance on GPS apps for travel to the use of digitalized formats for reading books, are *meant to be followed or adopted*. Underlying this uncritical conformity of opinion is an ideology of progress, enriching corporate enterprises, that technological advancement is inherently beneficial. But the psychology of trends cannot be explained by ideology alone. According to Bernard Stiegler (2015), the members of the so-called "app generation" are predisposed to follow trends due to the way their identities and cognitive styles are exploited online by a confluence of industrial and commercial forces he calls "attention-capturing psycho-technologies" (154). He argues that the uncritical use of social media and digital apps stupefies a large percentage of users, supplanting their personal individuation with anonymous, socially constituted personae whose priorities and interests are commercially determined and monitored online.  Not only is the technological psychogenesis of digital natives deindividuating them, wiring them to function socially but not existentially; the commercial forces at the heart of this process, via server farms and their web interfaces such as Instagram and Facebook, ensure that millions of online trend followers *convince each other* to be compliant with trends, even if they are foolish or bogus, due to the numerical superiority of sent and received "likes." The digital idealism that characterizes many internet advocates, and that has encouraged them to see revolutionary potential for sociopolitical action in the multitudes that can be mobilized online, blinds them to the downside of these herd-like behaviors such as belief in zombies, conspiracy theories, trolling, shaming, and spreading false information and hearsay.

Students are often appalled when it is suggested that trends are not always our friends. When I suggested that every trend, however profound or trivial, from purchasing the newest handheld, to adopting the newest app such as WhatsApp, to uttering an empty catchword such as "awesome" or "epic," must be independently evaluated by each user for its intrinsic value and pertinence, I encountered mild consternation and nervous laughter ("You're joking, right, Professor?"). When I suggested that each student deduce or assess for him or herself the relative necessity of adopting a trend, that one ought to gauge the meaning and significance of a trend for one's own existence, this line of reasoning was met with incredulity. There were groans of disbelief owing mainly, it turns out, to the anticipated burden of thought required to be a circumspect consumer of digital culture. How exhausting and inconvenient to exercise one's critical capacity in each case! Here thought as such, spellbound by the ideology of convenience and the alluring novelty of technical devices, finds it counterintuitive or nonsensical to *think* when *purchasing* and *adopting* will suffice. What are we saying? *Can thought be persuaded of its own inconvenience, steeped as it is in the culture of technological convenience?* It is as if thought, which normally serves as a selective filter for the objects and trends that solicit it, has incorporated the rhetoric of energy-saving convenience to *bypass or overrule itself* due to the strenuous demands of critique.

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Anyone who finds in these pages a bias against educational technology confuses it for my bias in favor of critique. Put plainly, I am wary of technocentric advocacy that prevails in the absence of critique, resulting in questionable academic planning and teaching. I agree with Stiegler (2015) that it is the "responsibility of the university" (29) to encourage critical rationality and challenge outbreaks of ignorance and unfreedom that mask themselves as hi-tech product enthusiasm in the service of learning. At my university, this issue was epitomized by a philosopher, of all people, whose captivation by technology determined his oversight of course design, a matter brought to my attention only because I inherited a course he had to relinquish mid-semester due to personal circumstances. By "critical oversight of course design," I mean careful reflection which leads the teacher of record to answer, by both professional insight and compliance with the official course outline, the following questions: "What knowledge should be learned? And how, exactly, shall that knowledge be demonstrated and assessed as a performance outcome?"

The course I took over at mid-semester, an "Introduction to Philosophy" consisting of a concise historical survey, is meant to inform students of historically significant philosophical concepts, movements, and thinkers. The methods of student learning assessment that were used before I took over the class consisted of multiple-choice exams, scored on scan sheets by computer, and a PowerPoint presentation given by students on a topic in philosophy. In other words, philosophy was treated as so much information to be identified in exams and showcased in a technically astute presentation, and not as a distinctive way of knowing and thinking, nor as a way of writing. The instructor who began the course was impressed with the convenience of grading exams on scan sheets. He told me as much, explaining that it was one way to meet the challenge of having to evaluate forty students. And, for reasons that were not explained to me, he was also convinced that PowerPoint presentations were an effective means of demonstrating student understanding of a philosophical topic or concept, although in my eyes such presentations primarily demonstrate student mastery of PowerPoint technology and how to simplify and visualize information. I was aware of the limitations of PowerPoint, that it artificially simplifies ideas, often in misleading ways, and inhibits creativity and argument, the very forces I seek to empower in young minds (Jackson, 21).  Now, there is nothing wrong *per se* with these methods or modes of assessing student knowledge of philosophy, but they were all I was expected to use as assessment criteria for grading the students. I felt that to be true to my own understanding of philosophy as a way of knowing guided by rational argument; and as a way of critical thinking, at heart dialectical, speculative, and meditative, as rigorous as science yet wary of science's monopoly of truth--to be true to this conception of philosophy, I required students to write, over the eight weeks remaining of the semester, four "critical briefs," succinct exegeses that would (1) pinpoint and crystallize *the matter at stake* in four different writings by philosophers, rather than merely summarize them; (2) engage with and clarify the philosophical argument (its logical structure of premises, claims, and justifying evidence) that implicitly or explicitly animates each essay; and (3) link the essay and its argument to the tradition, movement, and thinker(s) that are presupposed and critiqued by the philosopher. I also required a final exam, covering the material studied since the semester mid-way point, consisting of questions to be answered in concise exegetical essays. Exegesis, as a mode of critical thinking, is a struggle against servility in our reading and writing by personally intervening in and questioning information, that is, by actively sorting information into thematic clusters according to their meaning and significance. It is an attempt to take ownership, to

create value and make academic study worth living by gaining control over endless flows of information with a critical perspective that is empowering.

The time and effort needed to evaluate such exegetical assignments disqualifies them as a convenient means of assessment. But I had no experience using multiple-choice exams and scan sheets in my other classes (literature and creative writing). Obviously, the writing that I required of my philosophy students reflects my bias as an English professor who happened to do his doctoral work in literature and philosophy. English professors require essays for many reasons, but primarily because they concretely demonstrate learning outcomes, such as student understanding of specific texts and literary issues, while also demonstrating student writing ability in research and critique—literary criticism. Writing ability is considered integral to the education of English majors, whose focus of study, literature, is conceived as a way of writing. In acquiring literary knowledge and techniques of literary criticism, as students exercise skills in textual explication and research, they are expected to develop and refine their writing ability. Now, for reasons that are arguable, and that stretch back to Plato, most philosophers do not see philosophy as a way of writing, but as a way of thinking. This surely explains why, in addition to the issue of convenience, the course design that I inherited from a philosopher downplayed writing assignments in favor of multiple-choice exams. To be fair, the philosopher I replaced did require, at semester's end, a short paper from each student. But as I said, when I took over the class, that distantly pending paper seemed "too little, too late."

As with literary inquiry, academic philosophy should not slavishly identify, repackage, and transfer information, but interpret it critically through *Auslegung*, exegesis of texts and ideas, which involves both *Aufklarung* (explanation) and *Verstehen* (understanding). Today both literary criticism and philosophy conduct their respective critiques in written forms. Class discussion is crucial, of course, and philosophy prides itself--since Socrates--on being a dialogical mode of learning. I respected that, and encouraged discussion and debate whenever possible. But I had to see my students grapple with ideas and arguments in writing, work through them (*Durcharbeitung*) as the course progressed, to better assist them in clarifying and organizing their philosophical understanding. I had to oversee and if necessary correct their written practice of *doing philosophy*. And although I could not overlook the wildly disparate writing abilities demonstrated in the papers I assigned, my foremost concern was to critically assess their conceptual fluency, their capacity for logical argument, their use of reputable sources, and their comprehension of the subtleties of reasoning demonstrated in the philosophical writings they studied. How important is writing to the practice of philosophy today? As the contemporary German philosopher, Peter Sloterdijk (2013) observes in his insightful portrayal of Edmund Husserl, modern philosophy has transitioned, for better or worse, from discussion outdoors, in the ancient *agora*, to the writing desk, where "beholding and writing prove to be convergent activities," and "out of the pen of the thinker flows the ink of original evidence" (p. 84). Of Husserl he concludes, and in doing so epitomizes the new way of doing philosophy, as follows: "His own desk is the place where the contemplator deigns to let the world be present in its entirety. As the preferred setting for thematizing everything that appears, the philosopher's desk turns into a transcendental belvedere" (p. 84). In short, today writing is integral to philosophizing, and assessment of learning outcomes in philosophy cannot overlook student achievement in writing assignments.

While I am in no position to directly criticize, nor inclined to judge, the course design I inherited, it seemed to favor the convenience of technical forms of assessment at the expense of the spirit of philosophy, at whose core is rich, robustly sustained argument and critique. Whatever be the historical and institutional differences between literary criticism and philosophy, they share critique as the engine of their respective disciplinary efforts. Hence, my incorporation of critical exegesis assignments in the philosophy course I inherited was philosophically justified, and, in the face of good-natured groans by the undergraduates who had to suffer the consequences, I remained unapologetic while defending the virtue of the Freudian concept of *Durcharbeitung* or "working through" materials instead of finding a shortcut around their subtleties with a PowerPoint. Furthermore, my focus on student writing is continuous with Peter Sloterdijk's eloquently phrased portrayal of Husserl that modern philosophy has moved writing to the center of its interests and practice. This development should encourage literature and philosophy professors and their students to acknowledge their commonality, and to collaborate more actively than before in their shared pursuit of upholding and demonstrating rigorous forms of critique as examples for the entire university to emulate in its respective disciplinary practices. We are long past the epoch when philosophers customarily deemphasized the centrality of writing in their pursuit of wisdom. I have never understood how perspicuous, logical thinking can be expressed in muddled prose. To be sure, such thinking, often ferociously inventive, does not solely rely on traditional prose forms such as the essay. It can be expressed in aphorisms, as with Nietzsche and E. M. Cioran, or in truncated syllogisms and numerically listed propositions, as with Wittgenstein. But there are enough beautiful essays by the likes of Montaigne, Schopenhauer, and Merleau-Ponty to prove that fine writing is possible in philosophy, and worth striving for.as a learning objective—although its merits are not those of convenience.

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It is unlikely that progress will be made in critical assessment of the effectiveness of educational technologies, with actionable results for the classroom, until educators can temporality bracket and ascertain their personal fondness for those technologies, and gain an objective understanding of their long-term impact on the culture of learning, including the study habits, attentional behaviors, and cognitive styles of students. Such progress is inhibited, as I have argued in this essay, by the pursuit of short-term learning objectives favored by the assessment bureaucracy, and by the aggressive efforts of hi-tech companies to install their products in the classroom, as we saw in the cases of Googlification reported by Singer (2017). But an equally formidable challenge comes from the current practice of treating students as customers whose expectations of wired convenience compel teachers and administrators to replicate if not surpass the digital comfort zones enjoyed by their students at home. For some years I have declared in my syllabi that the classroom is an LDZ (Low Distraction Zone) where contemplation is welcome and encouraged, and where "critique" and "exegesis" are the watchwords for all our activities. Compared to a gaming parlor or movie theatre, you would call the ecosphere of my classroom "monastic," allowing of course for some hyperbole, given the energetic, primarily verbal engagement of students. The adjective is apt insofar as thoughtful respect for the texts under study, and for each other, is of foremost concern. The LDZ policy, which for example prohibits the use of smartphones, is not based on personal whim, but on research that shows distraction is counterproductive for learning; and it will stand until a student unearths research that proves otherwise. The rationale of this policy is also informed by the literary concept of defamilarization, according to which a genuine encounter with great literature is

productively disorienting, and by its corollary, that cognitive and linguistic adversity are often integral to advanced learning. The students who have repeatedly taken my courses console newcomers unused to the austere atmosphere: "It can be scary at first, but if you stick with it, you'll learn a lot and actually come to enjoy the course." By design, nothing is further from this LDZ setting than the wired, digitally distracting environs to which many students are accustomed at home or work.

But the digital Leviathan would have it otherwise, such that our classroom resembles the wired wonderland, outfitted with FAANG products, of a student's bedroom. It is arguable that my LDZ policy is too extreme. Fair enough. But students get their money's worth, if education is what they are paying for and not entertainment. In the best of all possible worlds, critically adept students, parents, and scholars would help negotiate, through informed argument and research, the selective instantiation of educational technologies that best enhance the learning outcomes of students without rendering them "app-dependent," empowering their capacity for creative expression, critical thinking, and self-determination. Alas, momentum is clearly in favor of the app advocates, an impressive majority that loses no sleep over isolated complaints about digital hegemony and the colonization of the lifeworld by Microsoft Office and Facebook.  Momentum, fortified by the tech titans and the sheer popularity of digital devices and media forms, seems to have enough force and numbers to compensate for a lack of longitudinal data that would firmly justify its global reach into classrooms. In any case, academic leaders are not supposed to blindly follow trends, but question and study them. What appears irresponsible to me is a banal remark such as, "In itself, technology is neither helpful nor harmful; it is simply a tool" (Gardner, 2000, p. 135).  By the time the same Gardner (2014) published his book on the app-generation, he knew better. But his banal remark is all too commonly echoed by educators even in 2017. In the absence of critique, the outcome of such a refusal to decisively settle the issue by logical argument and evidence-based research will by default favor the dominant trend of our time, which is the uncritical infiltration of digital technology into homes, workplaces, and campuses.

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# ACTION RESEARCH
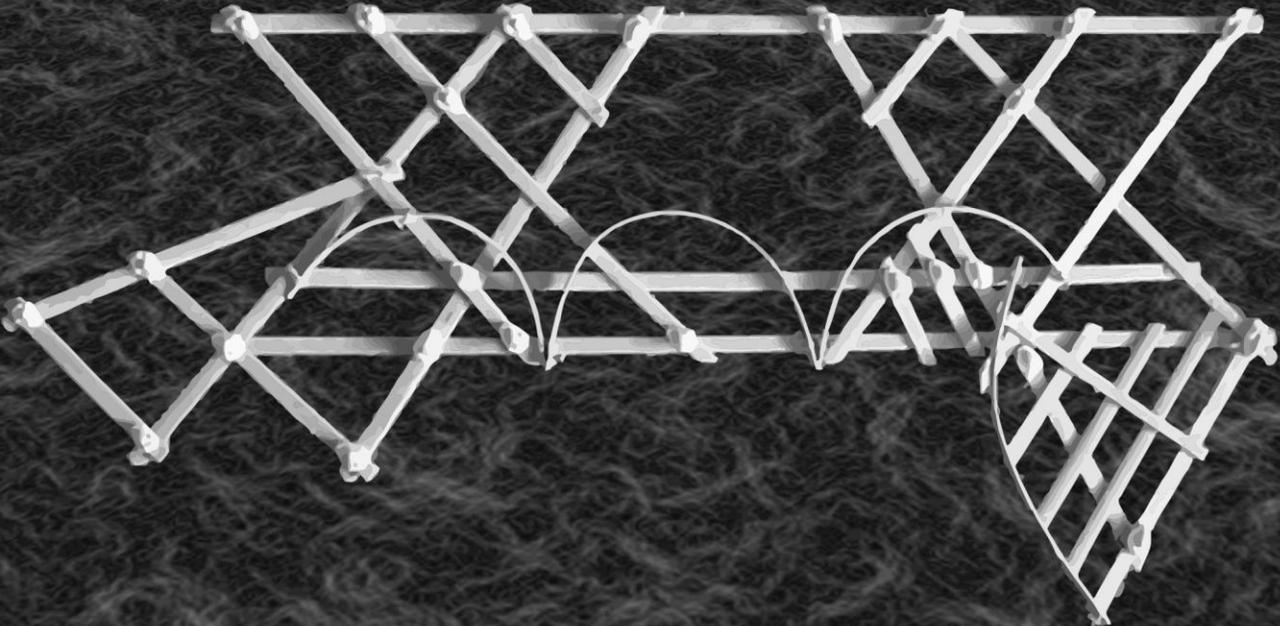
# The Effect of Multimedia-Based Instruction in Increasing ESL Students Test Scores in Eighth Grade Language Arts

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**Introduction**

Guam is an island rich in cultural and linguistic multiplicity and a U.S. protectorate. Various populations throughout the region of Micronesia have migrated to Guam in hopes to better their chances at enrolling in the educational system or attaining gainful employment. According to the Annual State of Public Education Report (2013), out of 31,698 students who were enrolled for the school year of 2012-2013, exactly 12,780 students were identified as English Language Learners (ELL). At a quantified 72.5%, vast majorities of Guam Public School Students were from the Federated States of Micronesia, the Commonwealth of the Northern Mariana Islands, and the Philippines (ASPER, 2013). Many of these students were placed in English as Second Language (ESL) classrooms or programs in an effort to develop and improve their English language skills (Aud et al., 2013), so that they would eventually be assimilated into the mainstream classroom with their English proficient counterparts.
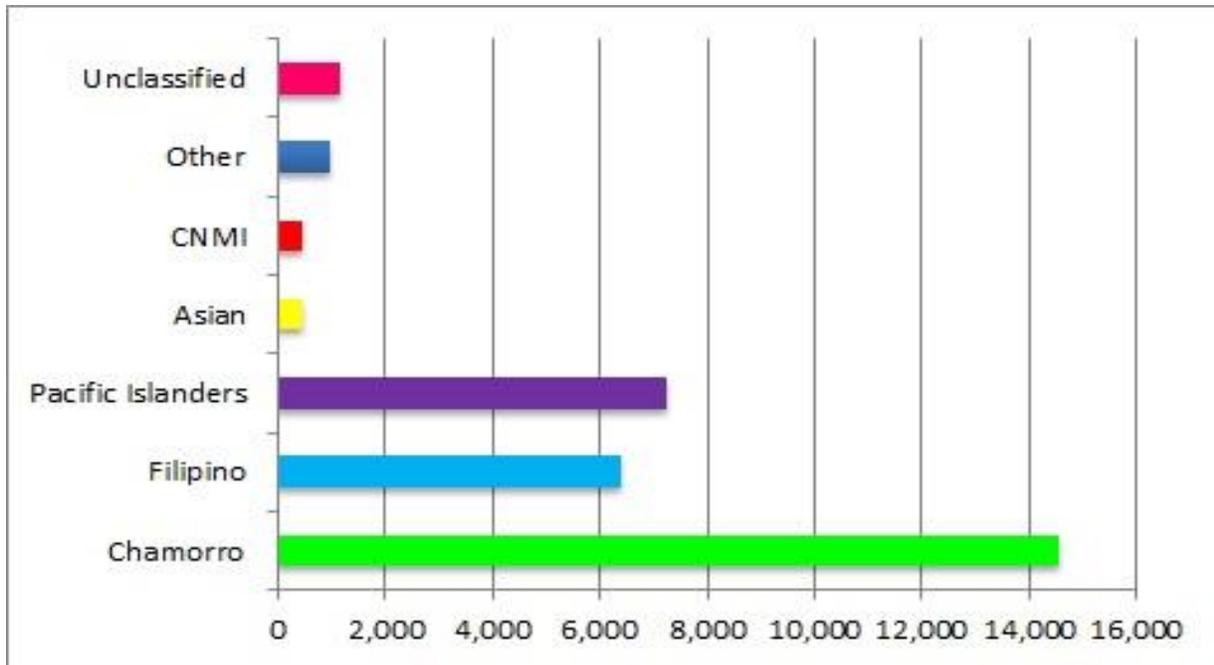
Therefore, Guam teachers need to be cognizant of these students' varying English language abilities and discover ways to improve their writing skills through various pedagogical strategies. In an effort to acquire effective English language teaching practices, educators need to agree first upon and designate a valid curriculum. The term curriculum refers to the lessons and academic content taught in a particular school or in a specific course or program (Anglin, 1999). To ensure the efficiency of a purposeful curriculum, inclusive of ELL and ESL students, the Common Core State Standards (CCSS) were introduced and implemented into the Guam Public School System by the Guam Education Board in the spring of 2012 (Fernandez, 2013).

**Background of Technology Use on Guam**

The abundance of information available on the Internet provides teachers access to innumerable language learning resources. Educational technology and Computer-Assisted Language Learning (CALL) provide many benefits in ELL classrooms for teaching writing skills. As a result, schools and districts in the United States are investing funds into all aspects of digital learning, from infrastructure and hardware to professional development (United States Department of Education, 2010). Teachers on Guam have endeavored to prepare students to perform at grade level with their respective counterparts, in the United States. Students on Guam are expected to move beyond rote memorization and the simple recitation of information. Instead, students are asked to produce and publish documents, interact, collaborate, and communicate using web tools, and evaluate information in multiple media formats (Department of Education Government of Guam Federal Programs Division, 2011). Ideally, students will use technology to bridge the gap between "local" and global education.

Comparatively, a study conducted by Kaewchawee (2013) in a Thailand middle school, sought to discover if teaching English vocabulary and grammar through the use of Multimedia-Based Instruction (MBI), would increase students' English language ability. This was a quasi-experimental study with a single

group pretest and posttest design. There was a significant difference between the overall mean core of the pretest and posttest at the .01 level. The mean scores on the posttest (M=20.96) were considerably greater than the pretest mean scores (M=12.06). This confirmed that MBI could successfully enhance the students' written English language ability.

Through the incorporation of multimedia in their instruction, teachers on Guam aspire to increase English as Second Language (ESL) students' English language ability. The Guam Department of Education (GDOE) has identified that at least 41% of the district's total enrollment were ESL students and were of 20 different ethnic/language groups from Asia and the Pacific islands (Annual State of Public Education Report, 2013).
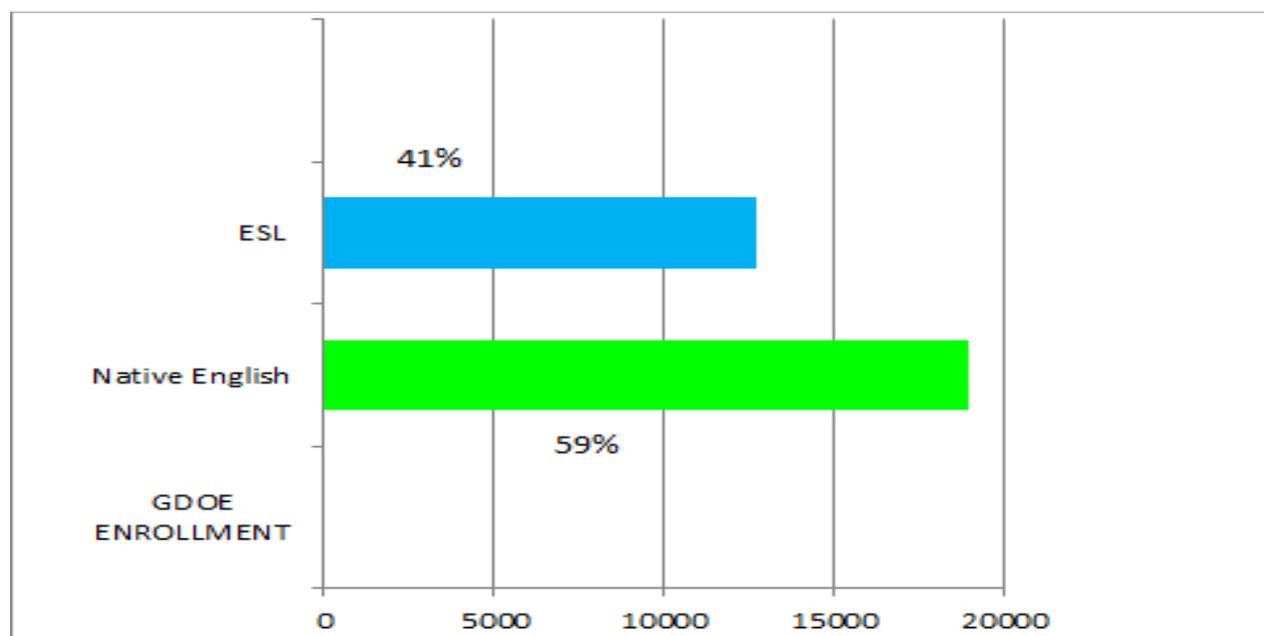


The district goal of the GDOE is to provide ESL students with adequate and equitable educational opportunities so that they may obtain high levels of English proficiency and meet the same academic content and achievement standards that all other students are expected to meet (Guam ESL Procedural Manual, 2012).

**Some Views from the Literature**

ESL educators find themselves to be in a perpetual pursuit to discover effective ways to engage their students during the learning process and to optimize student-learning outcomes. A multitude of technologies have been touted as being the latest delivery mechanism to achieve these laudable goals. Thus, Mayer (2001) articulated, "The advent of computer technology has enabled an explosion in the availability of visual ways of presenting material, including large libraries of static images as well as compelling dynamic images in the form of animation and video" (p.4). The underpinning for multimedia use in education was based on the notion that instructional messages should be designed in regards to how the human mind operates in order to achieve ideal results. It was assumed that that the human mind

has two information processing systems: one system for verbal material and another for visual material (Kay, 1982).

Technology, in the form of multimedia, allows for the accommodation of the diverse learning styles of students. Different students possess different types of minds; hence, they learn, remember, and comprehend information in different ways (Gardner, 1983). By integrating an understanding of learning styles with technology tools, technology can be used to create content for students in a variety of formats and provide a variety of options for student interaction. One of the best ways to facilitate this type of student interaction is by allowing students to create projects that reflect their own learning style (Inan & Lowther, 2010).

**Computer-Generated Audiovisual Material**

The fundamental principle behind multimedia learning was best described by Mayer (2001), "People learn better from words and pictures than from words alone" (p.6). In this context, words included written and spoken text, and pictures included static graphic images, animation and video. Multimedia typically referred to the presentation of material in two forms: auditory/verbal and visual/pictorial (Mayer, 2005). In a study piloted by Liaw (1997), TESOL teachers had sought to develop a language-rich environment, with the incorporation of computer books. These computer books were interactive stories that appeared on the computer screen as an actual book with text and illustrations. They contained a variety of interactive choices students could choose from, including: real voices that read aloud, music, and sound effects. The story is also highlighted so readers can follow along with the text.

Essentially, the use of meaningful video clips in teaching is most appropriate for introductory courses, introducing complex topics in any course, lower achieving students, and English Language Learners. Extensive studies in specific areas such as those that include EFL learners have produced significant results favoring videos (Borko & Pittman, 2008). Videos were used as a tool that engaged the verbal (linguistic), visual (spatial), and musical (rhythmic) intelligence of the student in the learning process, especially in the self-learning process (Gardner, 2000). Positive effects of features of video clips (multisensory, dynamic and capable of engaging the viewer's attention) were often used in education (Marques, 2012). That is, teachers were using multimedia presentations specifically formulated for course content as well as the inclusion of supplementary videos.

**Supplementary Video**

Furthermore, using video clips as a supplementary tool to support learning among students was a teaching strategy that continued to gain popularity today. Instructors were currently using various forms of multimedia to help improve understanding of their course content. Trends in technology have indeed altered the educational landscape and have caused changes in the way courses are developed and delivered (Hicks, Reid, & George, 2001). A field in which the effect of multimedia integration has been recognized is English as a second language (ESL) education. A report from the National Center for ESL Literacy Education (2002) discussed how many educators integrate multimedia such as slideshow presentations, video clips, overhead projectors and software programs to enrich their instructional activities.

Methods for integration and use of different contexts of supplementary videos in multimedia education materials for ELLs were important tasks for research aiming to improve the learning process (De Jong, 2010). Previous research explored the results of the use of videos as an educational tool (Hsin & Cigas, 2013). In this study the authors used educational videos with duration of approximately four minutes. They used a teaching platform based on Moodle and YouTube channels for reproduction. The study showed that streaming videos used as supporting material for learning had a positive effect upon ELL students' perception regarding the enhancement of their learning motivation. The study emphasized that proper definition of content and amount of information delivered through supplemental video is an

important task to solve. Durations of videos and methodologies of displaying them influenced the effectiveness of learning and student satisfaction (Cuban, 2001).

**Multimedia in the ESL Classroom**

Nonetheless, empirical research conducted to examine the influence of multimedia integration notes that the use of technology helped motivate ESL learners to develop strategies for successful learning (Mansoor, 2002). Other studies included positive attitudes towards individual features of developed programs such as interactivity (Bikowski & Kessler 2002), comprehension (Chen, Belkada, & Okamoto, 2004), and learner autonomy and responsibility of learning (Yan and Xiaoqing, 2009). Audio and visual technologies in the form of graphics, pictures, maps, and videos were used in ESL instruction. Audio materials encouraged listening skills while the visual presentation not only provided a focus of attention but also made it easier for language learners to fill in any information they did not understand.

According to Usun and Komur (2009), technologies such as movies and music have assisted instructors in language courses by affording them an opportunity to develop and create different, enjoyable tasks for their classes. Wang (2004) also articulated that the use of technology helped meet language learners' communication needs as well as helps them develop their language skills in the classroom. By incorporating a variety of technology, language students were given the sense of freedom, motivation, and encouragement they needed for learning (Donkor, 2012). However, it must be pointed out that using both audio and visual presentations simultaneously led to a higher effect when compared to a single presentation at one time (Mayer, 2001). Together, these presentations attracted the ELLs attention and assisted them in acquiring the main concepts of the subject matter being presented.

Audio-visual materials presented students with an infinite supply of information, especially in the form of cues such as facial expression, hand movement, and gestures which hold their attention and may have encouraged novice ESL students' to focus on the message at hand. In addition, the representations enhanced learners listening comprehension and helped with understanding of difficult materials (Ginther, 2001). Video segments were known to be the best presentation since they sparked interest by presenting information using multimedia formats and the language learners are able to link such presentations to enable comprehension. Results from some empirical studies conducted on the subject support the points mentioned above. Pawling (1999) investigated 11 participants reaction to language learning using CD-ROM packages. The packages included multimedia presentations of video, text, photograph and sound.

The findings showed that the use of the CD-ROM promoted collaborative learning while ensuring autonomous learning. Similarly, Tsai and Jenks (2009) conducted a quasi-experimental study to explore the effect of using a CD-ROM program as a supplement in teaching English language students. A total 87 students participated in the study. The students in the experimental group were assigned to two weekly one-hour sessions of use of a Teacher Guided Multimedia CD-ROM program while the control group received traditional instruction. The results from a vocabulary test showed that the experiment group achieved better English vocabulary acquisition compared to the control group. In short, most of the research indicated that the use of technology in language classes helped improve the four skill areas recommended for success, which is, listening, speaking, writing, and reading (Anderson & Speck, 2001).

Research suggested that educators needed to focus on the importance of using authentic activities and that materials should be selected with the needs and interests of the students in mind (Nation, 2001).

**Encourages Student Engagement**

Multimedia was most effective when the content and format actively engaged the learner. Active engagements helped the ELL construct knowledge and organize information into meaningful schema (Mayer, 2003). Research revealed that there were various ways in which multimedia presentations were designed to be more engaging. The use of onscreen characters had increased student engagement. This was especially true when the onscreen character appeared to interact with the learner (Ruigi, 2012). Presenting educational concepts in a story format was also effective in engaging non-native English speaking students. The narrative format had engaged students and helped them learn content and acquire new vocabulary (Lowe, 2002). The narrative format helped organize the information and made it easier to process the introduction of new words.

Multimedia that was more personalized engaged an ELL, more than multimedia that was less personalized (Mayer, 2005). Presentations that had a more conversational tone tended to be more engaging than those that had a more formal tone. Engagement seemed to play a role in activating knowledge structures (Mayer, 2005). As with other activation strategies, engagement appeared to help activate existing schema (organizing structures) as well as create new schema. Research also showed that the efficiency of the learning process was closely related to interaction between motivational and cognitive variables (Valle, Cabanach, Nunez, Gonzalez-Pienda, Rodriguez, & Pineiro, 2003).

**Enables Immediate Feedback**

Multimedia is most likely to be effective when ESL students are provided with opportunities to apply what they have learned following exposure (Mayer, 2005). This reinforces and strengthens the newly acquired knowledge. ESL students should be provided with opportunities to integrate what they have learned in their everyday life. Other strategies that help students integrate what they have learned include follow-up learning activities, class discussions and group activities. Feedback is an important part of the learning process, and multimedia is no exception. It is important to provide ELL with clear feedback about their progress on an ongoing basis (Gee, 2005; Perkins, 1992). Feedback helps keep students informed about their progress and helps them stay engaged. Providing feedback can reinforce what has been learned and can also correct any misconceptions.

Generally, providing feedback is an activity in which there is interaction between learners and their peers or their teacher. The ideal purpose of feedback is to encourage ESL writers' development or at least to encourage positive changes in subsequent writing (Long, 1996). Some researchers have argued for immediate feedback as a means to prevent errors being encoded into memory (Kulhavy and Stock, 1989). The superiority of immediate over delayed feedback has been demonstrated for the acquisition of verbal materials, procedural skills, and some motor skills (Anderson, Magill, and Sekiya, 2001). Corbett and Anderson (2001) findings is that delayed feedback may be superior for promoting transfer of learning for ESLs, especially in relation to concept-formation tasks, whereas immediate feedback may be more efficient, particularly in the short run and for procedural skills.

Furthermore, feedback is most effective when it is frequent and immediate. In multimedia language learning environments, both explicit/extrinsic feedback needs to be provided, as each has its own advantages. For example, explicit feedback provides the correct form and clearly indicates that the answer is wrong when their answer is incorrect. Such feedback helps ESL students to be sure about what they have just done and focus on the part they are going to do next. Summative assessments, such as test or exams can be supplemented by in process monitoring and comments from teachers. Multimedia applications that provide opportunities for student self-assessment offer a particularly valuable opportunity for feedback (Gee, 2005).

**Enhances Learner Comprehension**

Noytim (2006) proposed that effective teachers are able to appropriately implement teaching strategies to generate an effective and powerful learning environment. For that reason multimedia has become a significant English language-teaching tool because it involves all the sensory learning modes (Moore, 2012). Learning occurs best when the learner is self-motivated and the task at hand requires learner interaction and challenges the learner's cognitive processes. Active student involvement in the learning process always enhances learning. Most experts agree that ESL students learn best when they take an active role in the education process, discussing what they read, practicing what they learn, and applying concepts and ideas (Davis, 1993). "Active learning" as defined by Bonwell and Eison (1991) is "anything that involves students in doing things and thinking about the things they are doing." Active participation also involves slight shifting of roles and responsibilities; teachers become less directive and more facilitative, while students undertake increasing responsibility.

In a constructivist view, multimedia learning is a sense-making activity in which a learner ventures to construct a coherent mental representation from the material being presented (Najjar, 1996). Thus, Mayer (2001) articulated, "The advent of computer technology has enabled an explosion in the available of visual ways of presenting material, including large libraries of static images as well as compelling dynamic images in the form of animation and video" (p.4). The case for multimedia learning was based on the notion that instructional messages should be designed in regards to how the human mind operates. It assumed that that the human mind has two information processing systems: one system for verbal material and another for visual material (Tversky, Bauer-Morrison & Betrancourt, 2002).

Learning from multimedia presentations was enhanced when the structures for organizing the information were activated (Pollock, Chandler, & Sweller, 2002). Assisting students to recall or acquire structures helped them organize and understand the information was accomplished in several ways. Activation was accomplished by allowing students to preview the content though demonstrations, discussion, directed recall and written descriptions (Kalyuga, 2005), signaling what is salient, and demonstrating how the content is organized. Reviewing terminology that was encountered, such as, a presentation of graphic organizers, class discussions, and assessments, was also helpful in activating prior knowledge. Based on how the brain processes information, these preview activities helped activate existing schema (organizing structures) and create new schema to make it easier to grasp the new information in the presentation. Activating knowledge helped provide a structure from long term memory to understand and organize the new information from working memory.

In addition, multimedia delivered an expansive amount of information to students and accelerated the task of searching for pertinent data. Chang & Lehman (2002) claimed that, "Using multimedia in teaching and learning leads to higher learning since it provides a complex-sensory experience while exploring the world" (p.87). An appropriate mixture of multimedia in the classroom such as music, text, or video assisted students in developing confidence in their English language abilities while simultaneously stimulating their imaginations and increasing their motivation to learn. Realia stimulated the mind, and made the vocabulary more memorable than a simple image (Andersen & Speck, 2001). By introducing realia in the classroom, students gained a deeper understanding of the target language because of an item's tangibility.

Nevertheless, by including multimedia technology, which incorporated pictures or video into the lesson, the teacher provided students with the essential contextual cues to comprehend new concepts. Thus, according to Duckworth & Brozek (2004), "It is important to understand how students acquire a new language in order to appreciate the significance that technology can have in ensuring success for English language learners" (p.12). The idea was that inclusion of multimedia afforded students an opportunity to take pre-constructed material and make sense of it for their benefit. Students had become proficient in their acquisition of the English language as well as resourceful at negotiating meaning of texts. Consequently, it is the intention of the ESL teacher to improve students' linguistic skills so that they are able to function effectively in their educational endeavors. Therefore, this study aims to discover if there is an increase in quarterly test scores of ESL students in eighth grade Language Arts as a result of the integration of multimedia and to examine if there was a significance difference among the ethnicities who received the same amount of instruction and exposure of the multimedia material.

**Statement of the Problem**

With the emergence of the computer and the existence of the Internet, Guam classrooms have adopted the integration of technology into classroom instruction. Presently, the Guam Department of Education has implemented the integration of technology within the classroom based upon an effort to duplicate the United States' educational standards (Guam Department of Education, 2002). Guam's existing technological status has increased in utilizing contemporary communication devices such as Desktop computers, Internet access, and digital tools (Elmo projector, iPads, tablets.) Both the high-speed Internet and technological devices were made available to all K-12 public school teachers and administrators to be used for the enhancement of student achievement (Guam Department of Education, 2002).

As articulated in the District Action Plan (2007), GDOE will increase the percentage of students performing at level III by at least 5% for each grade level and will be measured by an adopted norm reference test each school year. Therefore, by the end of school year 2008-2009, and employing SAT9 scores as the baseline data, at least 50% of students in the grades tested will reach the 59th percentile in reading, math, and language arts. Over the years, the school system has made a concerted effort to include as many students as possible in the annual norm-referenced testing. Students receiving Special Education services and those who are English Language Learners (ELL) were provided accommodations when stipulated in either the Individualized Education Plan (IEP) or by the teachers (District Action Plan, 2007).

Language Assessment Scales (LAS) placement tests, such as the LAS Reading and Writing Assessments were testing instruments formerly used by GDOE to distinguish the overall English language proficiency of ESL students (Guam ESL Procedural Manual, 2012). The LAS Links K-12 Assessments yield an overall English Language Proficiency score of 1-5. Students who score 1, 2, or 3 are eligible for direct services in the ESL program. A student who scores 4 or 5 on initial assessment does not require services. LAS Links Proficiency Levels: (PL) PL 1 are Beginning, PL 2 Early Intermediate, PL 3 Intermediate, PL 4 Proficient, and PL 5, Above Proficient. It is imperative to point out that the assessment will not be a valid and reliable instrument unless the appropriate administration and scoring procedures are executed accordingly.

Several ESL programs have provided a variety of English language learning options and does not exclude variations of these basic types: Pull-Out Program, Sheltered Language Arts (Elementary), Sheltered Content Areas (Secondary), Consultation (Collaboration with ESL Coordinator or ESL Teacher and the regular classroom teacher), SPED-LEP (ESL student with IEP), and Follow Up (Students with a Parental Waiver (PW) who have met all criteria for exit (EX) or who are exempted from testing (EX). ESL students must be placed in a grade according to their chronological age, regardless of a student's English Proficiency Level. It is mandated that ESL students be assigned to the least segregated environment and limited separation is permissible only when it is educationally justifiable and the academic benefits outweigh the detrimental effects of segregation (Guam Public School System District Action Plan, 2007).

**Purpose of the Study**

The primary purpose of this study was to determine the effectiveness of Multimedia- Based Instruction in increasing ESL tests scores in eighth grade Language Arts. It also aimed to discover if there was a significant difference in test scores among different ethnicities who participated in the study (Chuukese, Chamorro, and Pohnpeian). The Guam Education Policy Board initially adopted the Guam Public School System District Action Plan (DAP) in May 2003. The DAP was mandated by Public Law 26-167 Section 3127 and established the direction and details for improving academic performance in reading, math, and language arts by using the provisions of the No Child Left Behind Act as a framework.

**Significance of the Study**

As a result of today's hi-tech era, regardless if a student was a native speaker of English or an ESL student, the fact of the matter is that technological devices trumped the traditional blackboard and chalk approach. Technological advancements that were crafted within the last few years, have allowed students to connect with their counterparts from across the globe without having to leave the classroom. Nevertheless, even if students were unable to connect online with people across the globe because the lack of Internet connections or classroom resources, like computers, there were numerous multimedia tools available to teachers and students alike.

**Research Questions**
1. Was there an increase in quarterly test scores of ESL students in eighth grade Language Arts as the result of Multimedia-Based Instruction?
2. Was there a significant difference in test scores among different ethnicities who participated in the study (Chuukese, Chamorro, and Pohnpeian)?

**Hypothesis**
The mean score of group two (posttest) will be greater than mean score of group one (pretest).

**Research Design**
This research study was a quantitative method study. The data that was obtained from eighth grade ESL students' scores on the pretest and posttest served as the source for quantitative data collection. The data was then be evaluated using a match t-test.

**Research Participants**
The participants in this study were 27 eighth grade students selected at random from different class periods from the same eighth grade Language Arts class for the school year of 2015-2016. This included male and female, nonnative English speakers with varying levels of English language abilities, inclusive of high, average, and low proficiency students. The students were categorized into high and low proficiency levels according to their pretest scores.

**Research Instruments**
The research instruments that were used in this study comprised of: English language pretests and posttest and student demographic questionnaires.

**English Pretest and Posttest**
Both the English pretest and posttest was the same test. The Language Arts pretest was used as an aptitude assessment used to measure the English ability of the participants before the experiment. The posttest was used as an achievement assessment and used to measure the English ability or skills as a result of the integration of multimedia in the form of slideshow presentations and video clips. The pretest and posttest assessed the participants in two aspects: vocabulary and grammar.

**Student Demographics Questionnaire**
The purpose of the student demographics questionnaire was to gather and record background of the sample population. The questionnaire included generic questions such as students' name, age, gender and ethnicity for basic information. Other questions delved more deeply into the amount and nature of exposure to the English language that the ESL students' have had prior to the eighth grade Language Arts Course for School Year 2015-2016.

**Results**
The following section presents the findings for the first objective.

**The Effectiveness of Multimedia-Based Instruction**
The students' pretest and posttest scores from the English Language Arts tests were calculated using a Matched Pairs t-Test between Means. The mean scores were then compared to determine if there was a significant difference between the pretest and posttest means using a sample t-test.

The results revealed there was a significant difference at the .05 level in the overall means of pretest and posttest scores. Table 1 illustrates the results of the overall mean scores. Figure 1 shows a bar graph for comparison of the overall mean scores.

**Table 1** Differences in the Overall Mean Scores of the English Pretest and Posttest of Students

| Students | N | Pretest Scores | | Posttest Scores | | t | p-value |
|---|---|---|---|---|---|---|---|
| | | M | S.D. | M. | S.D. | | |
| Experimental group | 27 | 10.06 | 1.99 | 14.96 | 2.20 | 12.365 | .001 |

*Significant at the .001 level (p<.05)

The posttest mean scores indicated there is a significant difference value, higher than the .05 level. The results demonstrated there was a significant difference between the pretest and posttest scores at the .05 level (t=12.365, p<.05).

**Figure 1** Compares the Overall Mean Scores of the Pretest and Posttest.
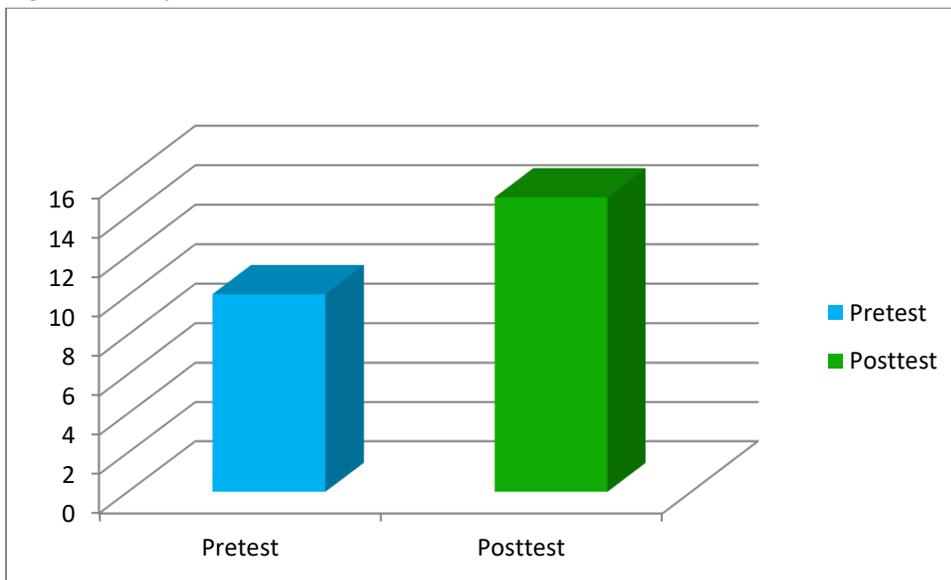


Differences in the Overall Mean Scores of the English Pretest and Posttest of Students According to Ethnicity

| Students | N | Pretest Scores | | Posttest Scores | | t | p-value |
|---|---|---|---|---|---|---|---|
| | | M | S.D. | M. | S.D. | | |
| Chamorro | 14 | 3.22 | 0.76 | 6.41 | 0.89 | 9.56 | .001 |
| Chuukese | 12 | 2.84 | 0.64 | 5.73 | 0.72 | 8.48 | .001 |
| Pohnpeian | 1 | 1.56 | 0.00 | 1.78 | 0.00 | 3.43 | .001 |

*Significant at the .001 level (p<.05)

**Figure 2** Compares the Overall Mean Scores of the Pretest and Posttest among the ethnicities that participated in the study.
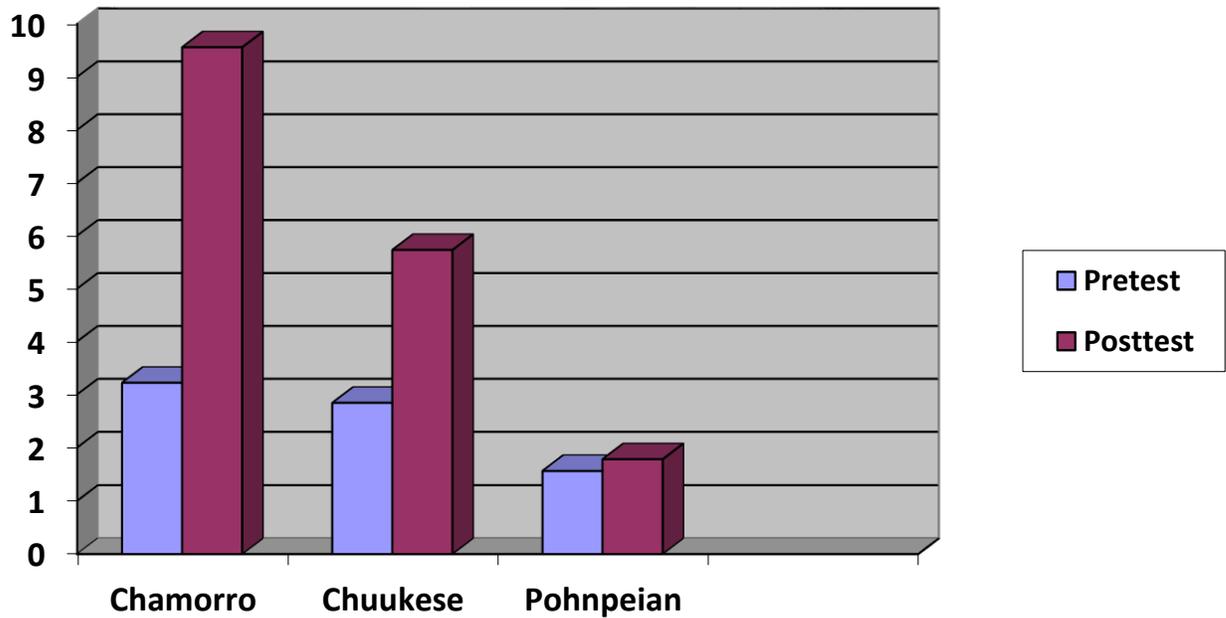


## Conclusion

This paper presents conclusions based on the results of the data analyzed. The paper includes a summary of the research questions and findings. The primary purpose of this study is to determine the effectiveness of Multimedia-Based Instruction in increasing ESL tests scores in eighth grade Language Arts. It also aimed to discover if there is a significant difference in test scores among ethnicities who participated in this study (Chuukese, Chamorro, and Pohnpeian).

## Discussion

The results of the two chief topics were, 1) the effectiveness of Multimedia-Based Instruction, and 2) significant difference in test scores among who participated in this study (Chuukese, Chamorro, and Pohnpeian).

## Discussion of the finding related to the first research question.

*Is Multimedia-Based Instruction effective in increasing ESL test scores?*

The central research question of the study was to investigate the effectiveness of MBI on students' English ability, specifically reading and writing. The results disclosed that overall; students did improve their posttest scores, and there was a significant difference in the scores. This validated that multimedia did indeed help to increase ESL student test scores and it was a substantial improvement.

**Discussion of the finding related to the second research question.**

*Is there a significant difference in test scores among the ethnicities in the study?*

The second objective addressed in this study was to find a significant difference in test scores among the ethnicities who participated in the study. An analysis of the students' demographic questionnaire indicated that 4.5% of Chamorro ESL students did better than Chuukese ESL students and Pohnpeian student.

**Implications of the study**

The results of this study indicated that MBI could successfully improve ESL students' English language ability. However, some implications for the English Language Arts teachers to consider when using multimedia are to personalize the multimedia presentation for students and invest in more interactive multimedia software.

Since multimedia learning concentrates on presenting a vast amount of information in a short amount of time, teachers must try to incorporate different audiovisual methods that appeal to the different English proficiency levels of students. Teachers must be conscious of possible language barriers or the fact that some students possess little to no exposure to multimedia beforehand.

**Limitations of the Study**

One chief limitation of this study was that only one public middle school on Guam took part in this research. Guam has several other middle schools available to students. The findings were not sufficient enough to be used as a general representation of the majority of eighth grade ESL students on the island.  A second major limitation of this research was the unbalanced amount of ethnicities that cooperated in this study. Out of 27 ESL students, there were 14 Chamorros, 12 Chuukese, and 1 Pohnpeian. Therefore, the results did not give a true representation in whether or not a particular ethnicity did better or worse than another.

**Recommendations for Further Studies**

The results of the study did support the effectiveness of MBI on increasing ESL test scores as previously predicted. Nevertheless, in developing ESL students' English ability through multimedia, the following recommendations are created for both researchers and teachers.

1.  Further research should be executed to investigate the effectiveness of multimedia at other secondary schools on Guam and elementary schools as well.

2.  This research study was designed as a single group pretest and posttest design. Further studies should be created to compare between a control group and an experimental group.

3.  Additional statistics to be ascertained in order to view where the other significant differences are (i.e. amount of exposure to English).

**Conclusion**

This chapter has discussed the chief results of the study. The findings demonstrated that there was an increase in eighth grade ESL students' English language ability, as a result of Multimedia-Based

Instruction. This study presented the benefits and opportunities to enhance ESL students' written skills. The results of this study proposed that using multimedia can be a suitable, pedagogical strategy to assist students in acquiring the necessary critical thinking skills, which will also improve their writing skills.

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**Appendix A**
*Student Demographics Questionnaire*

**Name: _____          Date:_____**

Please read each question and the put a check mark on your answer.
1. How old are you?
  - ☐  12
  - ☐  13
  - ☐  14
2. What is your gender?
  - ☐  Female
  - ☐   Male
3. Where were you born?
  - ☐  Guam
  - ☐  Chuuk
  - ☐  CNMI (Saipan, Tinian, Rota)
  - ☐  The Philippines
  - ☐  Other (A place that is not listed) Please write it in: _____
4. What is your ethnicity?
  - ☐  Chamorro
  - ☐  Chuukese
  - ☐  Filipino
  - ☐  Other (An ethnicity that is not listed here) Please write it in: _____
5. How long have you lived on Guam?
  - ☐  Less than 1 year

- ☐ 1-3 years
- ☐ 4-8years
- ☐ 9-10 years
- ☐ More than 10 years
- ☐ All your life

5. What is your first language? (What language do you speak at home the most?) You may only choose one.

- ☐ English
- ☐ Chuukese
- ☐ Chamorro
- ☐ Tagolog
- ☐ Other (A language that is not listed here) Please write it in: _____

6. What is your second language? (What language do you speak outside of your home the most?) You may only choose one.

- ☐ English
- ☐ Chuukese
- ☐ Chamorro
- ☐ Tagolog
- ☐ Other (A language that is not listed here) Please write it in: _____

7. In which of these activities do you speak English: You may choose more than one

- ☐ Watch television
- ☐ Listen to Music
- ☐ Talk to friends
- ☐ Talk to family
- ☐ Read books, newspapers, or magazines
- ☐ Social media (Post comments on Facebook, Instagram, or Twitter)

8. How long have you lived on Guam?

- ☐ Less than 1 year
- ☐ 1-3 years
- ☐ 4-8years
- ☐ 9-10 years
- ☐ More than 10 years
- ☐ All your life

9. How important is it for you, to **speak** English properly?

- ☐ Very important
- ☐ Somewhat important
- ☐ Not important at all

10. How important is it for you, to **write** English properly?

- ☐ Very important
- ☐ Somewhat important
- ☐ Not important at all

# Increasing Student Achievement Through the Use of Technology in Art: An Action Research Study Done on Guam

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## Introduction

Most educators agree that students learn more when they are engaged in work that is relevant and meaningful for them (Andrews, 2010; Geimer, 2014; Kay, 2009; Lambert & Cuper, 2008; Preus, 2012; Saavedra & Opfer, 2012; Smith & Hu, 2013). It is then that the students enter a psychological state of mind called "interest experience" (Geimer, 2014). They are not driven by outside pressure to learn the material, but driven by their own genuine interest. When "interest experience" occurs, students learn most efficiently, because the work assigned has a purpose and they can see how it is relevant to their life.

The use of technology in a classroom setting can increase the frequency for student learning in the 21st century (Lambert & Cuper, 2008; Lee, Waxman, Wu, Michko, & Lin, 2013). Today's students are immersed in a variety of technologies from a young age. They are different from students in the past because they are a generation that has spoken the language of technology since birth. It is for this reason that they have different learning goals and require different teaching approaches. Lambert and Cuper (2008) state that teachers cannot assume that learners learn the same way they always have and that the same methods used years ago will work today. Gunn and Hollingsworth (2013) state that "it is likely that educational practitioners are already using 21st century methods and strategies in varying degrees and simply need additional support and professional development to ensure full application (p. 203).

The issue is that majority of schools' curricula remains the same today as it was throughout the 20th century (Gorder, 2008; Kay, 2009; Kereluik, Mishra, Fahnoe, & Terry, 2013; Smith & Hu, 2013). It is difficult for teachers to implement technology when they themselves have low technology skills that are relative to current technology trends and use (Archambault, Wetzel, Foulger, & Williams, 2010; Smith & Hu, 2013). According to Lambert and Cuper (2008), teachers need to understand the mental changes in today's students and find new methods and ways to speak their new language. Gorder (2008) states that technology integration is not about the availability of technology, but more about the teachers' effective use of technology that makes a difference in reforming the classroom. That is why there is such a call for

21<sup>st</sup> Century knowledge frameworks—it is based on the assertion that teachers have not been able to fully prepare students for the demands of the 21<sup>st</sup> century.

Twenty-first century education requires students to have a broad and intensive use of technology to succeed in a global economy (Archambault et al., 2010; Gorder, 2008; Kereluik et al., 2013; Lambert & Cuper, 2008; Lee et al., 2013; Saavedra & Opfer, 2012; Shin, Sutherland, Norris, & Soloway, 2012; Smith & Hu, 2013). It is for this reason that the labor force requires an altogether different model of education—one that requires students to be well-versed in technology to keep up with our constantly changing world. According to Saavedra and Opfer (2012), it is agreed that technology holds great promise for education, but it has not lived up to this promise because teachers have not had the opportunity to learn how to maximize its pedagogical value. To ensure quality instruction, connections and interactions between and among pedagogy, content, and technology must exist (Gunn & Hollingsworth, 2013; Kereluik et al., 2013; Smith & Hu, 2013).

**Significance and Research Questions**

The purpose of this study is to determine if the students' use of technology in a middle school art classroom increases student achievement.  The research questions guiding this study are:

1.  What are students' perceptions regarding technology in general?

2.  What is the effect of the integration of technology in an art classroom on student achievement?

**Some Views from the Literature Review**

A review of literature is presented to discuss 21<sup>st</sup> century skills, the significance of learning how to use technology, and the promotion of the use of technology. Twenty-first century skills have been divided into 4 subcategories, which will be elaborated in this review. In discussing the promotion of using technology, what is considered effective use of technology will be examined.

**What Are 21<sup>st</sup> Century Skills?**

The four twenty-first skills have been identified as: 1) critical thinking, 2) problem-solving, 3) communication, and 4) collaboration, each of which can be readily engaged through careful use of multimedia technologies in the classroom setting (Archambault et al., 2010; Gunn & Hollingsworth, 2013; Kay, 2009; Kereluik et al., 2013; Lambert & Cuper, 2008; Preus, 2012; Saavedra & Opfer, 2012; Smith & Hu, 2013). These skills include intelligent reasoning, positive attitudes, and practical skills that provide a framework for learning that motivates and engages students and will be elaborated upon below.

**Critical thinking and problem solving**

Critical thinking skills involve the ability to interpret information and make informed decisions based on that information. "Bloom's early taxonomy of cognition included six graduated levels of thinking that move from knowledge to comprehension, application, analysis, synthesis, and finally, evaluation" (Lambert & Cuper, 2008, p. 265). These higher levels of thinking form the basis for developing all other 21<sup>st</sup> century skills. It is crucial that students learn critical thinking skills to be qualified for jobs in the ever-changing economy of the future. Levy and Murnane (2006) states that students need to be able to "solve new problems that can't be solved by applying rules. If the problem can be solved by rules, a computer

could do it" (p. 57-58). Students can learn how to analyze information in order to make decisions on whether the content they are accessing is valid and from a reputable source.

Problem solving uses critical thinking skills to resolve a specific problem or come to a specific end goal (Kereluik et al., 2013, p. 130). Both problem solving and critical thinking are not unique to the 21$^{st}$ century. However, they are transformed by technology now. Donovan, Green, and Mason (2014) suggest the following:

> Students learn to make judgements and decisions by learning how to analyze and evaluate evidence, arguments, claims, and beliefs; analyze and evaluate major alternative points of view; synthesize and make connections between information and arguments; interpret information and draw conclusions based on the best analysis; and reflect critically on learning experiences and processes (p. 165).

**Communication and collaboration**

Communication centers on the students' ability to articulate their thoughts effectively to others. According to Kereluik et al., (2013), communication most frequently involves the ability to clearly articulate oneself through all media of communication—oral, written, nonverbal, and digital—as well as the skills necessary to be an active and respectful listener to diverse audiences. Levy and Murnane (2006) explain that, "Communication is not only the ability to transmit information, but also to convey a particular interpretation of information to others in jobs like teaching, selling, and negotiation" (p.58). Using current technologies, communication is not only easier than it was in the past — it is also constantly available in a wide variety of forms. "Students are increasingly expected to use digital media to interact, communicate, collaborate, and publish with peers, experts, and others using a variety of digital media" (Lambert & Cuper, 2008, p. 265). "As a result for increased opportunity for interaction across countries and around the world, teachers need to know how to foster cultural competence, emotional awareness, and leadership skills to facilitate not just interactions, but meaningful interactions and relationships" (Kereluik et al., 2013, p. 133).

Collaboration is similar to communication, but it also includes individual contributions such as flexibility and a willingness to participate and work together with others. With increased globalization, individuals from diverse cultures are exposed through one another and successful communication and collaboration is essential. Saavedra and Opfer (2012) state that "the interconnectedness of our global economy, ecosystem, and political networks require that students learn to communicate, collaborate, and problem solve with people worldwide" (p. 8). According to the study by Donovan, Green, and Mason (2014):

> From a teaching experience, teaching students to work creatively with others involve teaching students to be able to develop, implement, and communicate new ideas with others effectively, and be open and responsive to all perspectives, incorporating peer input and feedback into the work (p. 164).

**Significance of Learning How to Use Technology**

The labor force required by an increasingly globalized economy requires an altogether different model of education (Archambault et al., 2010; Kay, 2009; Kereluik et al., 2013; Lambert & Cuper, 2008; Saavedra & Opfer, 2012; Smith & Hu, 2013). That is why it is so important for students to learn how to use technology in order to keep up with an increasingly globalized economy accelerated by technological modernization. According to Lambert and Cuper (2008), "today's students must learn how to think deeply about their learning so they can realize their place in a rapidly changing, global society" (p. 265). Employers are looking for qualified individuals who possess 21st century skills and can successfully demonstrate these skills through the use of technology. In a study done by Gunn and Hollingsworth (2013), the authors found that implementing technology in the classroom can reduce learning barriers, improve academic success, increase student chances for learning success, lead to higher high school completion statistics, create a greater sense of adaptive communication and school community, and provide greater opportunity for flexible access to learning.

**Promoting the Use of Technology**

To prepare students for the 21st century world, students and teachers need to learn to use technology effectively (Archambault et al., 2010; Gorder, 2008; Gunn & Hollingsworth, 2013; Kereluik et al., 2013; Lambert & Cuper, 2008; Lee et al., 2013; Saavedra & Opfer, 2012; Shin et al., 2012; Smith & Hu, 2013). "Classroom teachers must also be masters of not only content knowledge, but technology as well. They typically come to the profession with relatively low technology skills that are relative to current technology trends and use" (Smith & Hu, 2013, p. 100). Teachers need to know how and why to use technology in meaningful ways in the learning process to be able to teach effectively with technology (Gorder, 2008; Kereluik et al., 2013), such as knowing when to use a particular technology for activities such as collaboration, or why to use a certain technology for acquiring specific knowledge. "Teachers need to know not just the subject matter they teach but also the manner in which the subject matter can be changed by the application of technology" (Archambault et al., 2010, p. 7-8).

Smith and Hu state that today's students may be very familiar with social networking sites, digital music, and video sharing, but they are not as familiar with many of the opportunities technology offers to enhance and provide quality instruction (Orey, McClendon, & Branch, 2006). According to Archambault et al., (2010), students will not be able to develop 21st century skills without the use of technology, and teacher educators are faced with a challenge to try to help students make sense of the importance of integrating these skills and developing appropriate uses of tools in the content. It is extremely crucial that teachers promote the use of technology in a way that is most effective for enhancing student learning. Donovan, Green, and Mason (2014) suggests that it is the teacher's responsibility to provide for the experience of students to develop 21st century skills needed in order to navigate the complexities of life and work environments in the globally competitive information age.

Educators agree that effective use of technology happens when there is student interaction with the teacher, student interaction with resources using technology, student interaction with other students, and student interaction with all of the above (Archambault et al., 2010; Gorder, 2008; Kereluik et al., 2013). According to Gorder (2008), technology is the mechanism for increasing the amount of human-to-human interaction between teachers and students in the classroom and is used by teachers for interaction to meet the needs of the students' changing learning styles.

**Methodology**

The purpose of this study is to determine if the students' use of technology in a middle school art classroom increases student achievement. The research questions guiding this study are:

1. What are students' perceptions regarding technology in general?

2. What is the effect of the integration of technology in an art classroom on student achievement?

*Research Setting*

This study was conducted at a public middle school on Guam, a small island in the Pacific, which is an unincorporated territory of the United States. The school has a total population of 611 students. Chamorros make up 84% of the student population, Pacific Islanders make up 12%, and Filipino, CNMI, White, and Other make up 1% each of the rest of the population. ESL (English as a Second Language) students make up 35% of the population. The school follows a traditional bell schedule of seven classes every day with each class lasting 45 minutes.

The study took place in an art classroom with a total of fifty-five 7th grade students in four of my classes. There were 24 male students and 31 female students. Two classes were the control group, while two classes experienced the intervention.

**Table 1**: Profile of Research Setting

|  | Male | Female | ESL | SpED | Time |
|---|---|---|---|---|---|
| 1st Period (Experimental Group B) | 7 | 3 | 0 | 1 | Morning |
| 3rd Period (Control Group A) | 4 | 10 | 3 | 0 | Morning |
| 5th Period (Experimental Group B) | 5 | 10 | 3 | 1 | Afternoon |
| 7th Period (Control Group A) | 8 | 8 | 2 | 1 | Afternoon |

**Intervention and Data Collection**

The research design used a mixed methods experimental approach. There were two classes of students in the experimental group (Group B) and two classes in the control group (Group A). With the data collection of pre- and post- test scores, project scores, and a survey at the end of the lesson, I

determined whether student scores improved by incorporating technology into their lessons.

At the beginning of the semester, my 1st and 5th period students (experimental Group B) used technology to help them learn about color theory. My 3rd and 7th period students (control Group A) were not taught with the integration of technology.

On the 1st day of the lesson, I gave all my periods a color theory pre-test in which they had to answer questions about the color wheel and color schemes (see Appendix B and C).

On the 2nd day, after the pre-test was given, experimental Group B students used the library computers to access 2 videos on the Internet explaining the effects of color in real life situations. Students were then directed to 2 interactive color mixing sites where they experimented with colors resulting from mixing. Control Group A students stayed in the art classroom and were taught color theory by me. I introduced the history of Pop Art as well as went over the color wheel and color schemes, which is normally how I teach this lesson.

For the 3rd day, experimental Group B students accessed the Internet and watched a video on how color influences consumer decisions. They were then split into groups of 2-3 and entered an online discussion board to discuss their product, packaging, color choices, and target audience. Control Group A students stayed in the art classroom and were given a color wheel template which they painted and mixed primary colors to produce the correct colors.

For the 4th day, experimental Group B students were in the art classroom in their respective groups sketching out the design for the packaging of their product. Control Group A students were sketching out their drawing as well for their Pop Art project.

On the 5th day, experimental Group B students accessed the Internet to use an online painting tool to draw and paint their design online. They were able to see how their packaging would look before actually painting it in the classroom. Control Group A students were in the classroom transferring their drawings onto the final paper using carbon paper.

On the 6th day, experimental Group B students were drawing their final design on a blank cereal box. Control Group A students started on painting their Pop Art drawing.

On the 7th- 12th day, experimental Group B students were painting their packaging design, using only primary colors to achieve any colors needed. Control Group A students were continuing with their painting.

On the 13th day, both groups studied for their test. Experimental Group B students accessed the Internet to play an online game testing their knowledge and application of content. Control Group A students were in the art classroom studying their color wheel and notes.

On the 14th day, both groups were given the post-test (see Appendix B and C). Experimental Group B students were also given a 4-point Likert scale survey asking their thoughts on using technology in

general (see Appendix A).

Permission to conduct this study was obtained from the University of Guam Committee on Human Research Subjects and the Guam Department of Education Research, Planning, and Evaluation Division. Liabilities or endorsements were assumed by either of the aforementioned entities. Confidentiality of students was maintained—no students were identified in this study.  All identifying information was removed.  Only the teacher-researcher had access to this information, which was kept in a secured file.

**Data Analysis**

The data from the students' pre-test, post-test, painting scores, and survey were collected and analyzed using a descriptive analysis comparing mean and standard deviation. They were summarized according to the research questions guiding this study.

*Research Question 1*

What are the students' perceptions regarding the use of technology in general? Data was collected using a student perception survey consisting of nine items. The survey was given to Group B (students who were brought to the library to use the Internet). Students responded to each item using a Likert Scale rating: 1 = Strongly Disagree, 2 = Disagree, 3 = Agree, and 4 = Strongly Agree. The frequency and percentage of responses for each survey item and for each rating will be presented in a table.

**Table 2**: Students' Perceptions Regarding Technology (N=25)

| Item | 1<br><br>Strongly Disagree | 2<br><br>Disagree | 3<br><br>Agree | 4<br><br>Strongly Agree |
|---|---|---|---|---|
| 1. I want to learn more about using the Internet. | 0<br><br>0% | 1<br><br>4% | 12<br><br>48% | 12<br><br>48% |
| 2. The Internet makes schoolwork more fun/interesting. | 1<br><br>4% | 0<br><br>0% | 6<br><br>24% | 18<br><br>72% |
| 3. The Internet makes schoolwork easier to do. | 0<br><br>0% | 2<br><br>8% | 7<br><br>28% | 16<br><br>64% |
| 4. I generally enjoy schoolwork. | 6<br><br>24% | 2<br><br>8% | 12<br><br>48% | 5<br>20% |
| 5. I prefer to use computers to do schoolwork instead of using | 1 | 3 | 5 | 16 |

| | | | | |
|---|---|---|---|---|
| pencil/paper. | 4% | 12% | 20% | 64% |
| 6. I would prefer to use the computer for most of my learning. | 1<br><br>4% | 3<br><br>12% | 11<br><br>44% | 10<br><br>40% |
| 7. I think my ability with the Internet will affect the grades I get. | 3<br><br>12% | 6<br>24% | 8<br><br>32% | 8<br><br>32% |
| 8. Using computers for schoolwork is a distraction. | 13<br><br>52% | 8<br><br>32% | 2<br><br>8% | 2<br><br>8% |
| 9. Using computers for schoolwork is more work to learn. | 8<br><br>32% | 8<br><br>32% | 6<br><br>24% | 1<br><br>4% |

In Table 2, items 1 and 2 show that 24 out of 25 students (96%) agreed to strongly agreed that the Internet makes schoolwork more fun/interesting and that they wanted to learn more about using the Internet. Items 5 and 6 had 21 students (84%) agreeing to strongly agreeing that they would prefer to use computers to do schoolwork instead of using pencil/paper and that they would prefer to use the computer for most of their learning. Item 8 shows that 21 out of 25 students (84%) disagreed to strongly disagreed that using computers for schoolwork is a distraction.

*Research Question 2*

What effect does the integration of technology in instruction have on student achievement? The mean and standard deviation for the pre- and post-test for both groups were recorded, as well as their painting scores.

**Table 3**: Pre-Test, Post-Test, and Painting Scores

| | Pre-Test | Post-Test | Gain Scores | Painting Scores |
|---|---|---|---|---|
| Group A (Control) | | | | |
| N | 27 | 31 | | 31 |
| Mean | 6.37 | 21.63 | 15.26 | 18.10 |
| SD | 2.42 | 3.82 | 1.4 | 1.80 |
| Group B (Experimental) | | | | |

| N | 21 | 26 | | 26 |
|---|---|---|---|---|
| Mean | 8.24 | 20.96 | 12.72 | 16.69 |
| SD | 2.04 | 3.23 | 1.19 | 3.18 |

I ran an independent samples t-test to compare the students' pre- and post-test scores and painting scores between the two groups (experimental and control) to determine if the differences among these scores were significantly different. The independent variable was the instruction type (no technology and technology), and the dependent variables were the pre-test, post-test, and painting scores. To analyze the data, I set the alpha level of significance at .05 ($\alpha = .05$). If the p-value is greater than or equal to .05, then the null hypothesis is retained. If the p-value is less than .05, then the null hypothesis is rejected. To run this test, I identified the following null hypotheses:

$H_{01}$: There is no significant difference in the pre-test scores between students who used technology and students who did not use technology.

**Results**

The results of the independent samples t-test show that there was a significant difference in the pre-test scores between control Group A (no technology) and experimental Group B (technology): $t(46) = 2.84$, $p = .0067$. Thus, the null hypothesis is to be rejected. These results indicate that the mean pre-test score of the no technology group (M = 6.37) was lower than the mean pre-test score of the technology group (M = 8.24), and this difference was statistically significant.

$H_{02}$: There is no significant difference in the post-test scores between students who used technology and students who did not use technology.

**Results**

The results of the independent samples t-test show that there was no significant difference in the post-test scores between control Group A (no technology) and experimental Group B (technology): $t(55) = .71$, $p = .48$. Thus, the null hypothesis failed to be rejected. These results indicate that although the mean post-test score of the no technology group (M = 21.63) was higher than the mean post-test score of the technology group (M = 20.96), this difference was not statistically significant.

$H_{03}$: There is no significant difference in the painting scores between students who used technology and students who did not use technology.

**Results**

The results of the independent samples t-test show that there was a significant difference in the painting scores between control Group A (no technology) and experimental Group B (technology): $t(55) = 2.1$, $p = .04$. Thus, the null hypothesis is to be rejected. These results indicate that the mean painting

score of the no technology group (M = 18.10) was higher than the mean painting score of the technology group (M = 16.69), and this difference was statistically significant.

**Discussion of Outcomes**

The insights I gained from this study are described below according to the research questions.

*Research Question 1*

What are students' perceptions regarding the use of technology in general? The survey results show that the majority of the students want to learn more about the Internet and want to be able to use the Internet as part of their learning. Also, the majority of the students would rather use the computer to do their homework than pencil and paper, and they did not think the Internet was a distraction. As Hu and Smith (2013) state, today's students may be very familiar with social networking sites, digital music, and video sharing, but they are not as familiar with many of the opportunities technology offers to enhance and provide quality instruction (2013). I think students want to learn how to use these sites that they frequent to do schoolwork. Using these websites is already familiar to them, but to use it for schoolwork might peak their interest in schoolwork. Students were using YouTube to look up how color affects real world applications and going on interactive websites to learn color theory; this helped open their eyes to using websites that they frequent to complete their work. For the most part, the students in my experimental group were extremely excited when they found out they would be using computers for the lesson. They could not wait to start learning. If more educators let students use computers in their learning, I think more students would be receptive to learning new information and enjoy doing it as well. When I conducted the online game for the experimental Group B students, they had so much fun. After the game was over, they all wanted to replay the same game. In a study done by Lambert and Cuper (2008), they found that today's students have short attention spans for old ways of learning but not for games or anything that really interests them. They crave interactivity and an immediate response for every action. Based on this information, I think that it is important for teachers to implement critical thinking and problem solving while still maintaining digital language and tools in order to relate to the students.

*Research Question 2*

What effect does the integration of technology have on student achievement? According to Archambault, Foulger, Wetzel, and Williams (2010), teachers need to know the subject matter they are teaching, as well as how the subject matter can be changed by incorporating technology. After conducting my study, the results revealed that using technology in their learning did not guarantee better scores for students. Although experimental Group B students (with technology integration) were more excited about the lesson and getting the chance to use the Internet, they actually scored significantly lower on their painting project than control Group A students (no technology integration). One reason that the experimental Group B students might have scored lower with their paintings than control Group A students could be that there was not enough time; some students might have been absent on the day that the students accessed the interactive websites to learn color theory. Another reason could be that I, as a teacher, need more training on how to incorporate technology effectively in the students' learning. According to Gorder (2008), successful technology integration involves students interacting with the teacher, resources, other students, and all of the above. I tried to incorporate these interactions each time

the students used technology, but it was difficult. Sometimes the resources (Internet) were not working or available, and sometimes other students (needed for group partners) were absent.

**Recommendations/Reflection**

Performing the intervention made me realize that I need to incorporate technology into more of my lessons to pique the interest of this new generation of 21st century students. Some students do not have the chance to use technology except at school, so they are excited to get to use it in their classes. More research is needed to determine if integrating technology will necessarily help the students achieve better scores on their assessments, but at least it will better prepare them for their future dealing with technology.

If I were to conduct this study again, I would make sure that time was not a limitation of time in this study and that there is sufficient time available for students to make up specific lessons if they missed any, because they could have missed a whole concept such as color mixing in one day. It would help if every student was required to have an email address in order to send them make up work and be able for teachers to create assignments that students complete online.

I think it is important for schools to have professional development training for teachers on integrating technology in the classroom. Based on a study by Gorder (2008), the author states that research shows the teacher is considered an important factor for success when using and integrating technology. Teachers know more about using technology to deliver instruction than they do about integrating technology into teaching and learning. Because of this, professional development programs are important in helping teachers use technology to effectively implement 21st century skills into the classroom. According to Lambert and Cuper (2008), "such technologies provide avenues for creativity and foster inclusion of 21st century skills in teacher education curricula" (p. 274), which is beneficial in an art classroom. In a subject such as art, where creativity and problem-solving skills are constantly practiced, using technology is necessary for the students. Integrating technology in students' learning exposes students to 21st century learning skills and supports the concept of technology being relevant and integral in every discipline. Administrators and school leaders need to recognize the importance of technology integration and offer more support in helping teachers learn how to do so. When the technology is already familiar and teachers employ these tools to challenge students, schools will reap the benefits of teaching today's students in their familiar spaces.

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**Appendix A: Survey**

| Student Survey | | | | |
|---|---|---|---|---|
| | Strongly Disagree 1 | Disagree 2 | Agree 3 | Strongly Agree 4 |
| 1.) I want to learn more about using the Internet. | | | | |
| 2.) The Internet makes schoolwork more fun/interesting. | | | | |
| 3.) The Internet makes schoolwork easier to do. | | | | |
| 4.) I generally enjoy schoolwork. | | | | |
| 5.) I prefer to use computers to do schoolwork instead of using pencil/paper. | | | | |
| 6.) I would prefer to use the computer for most of my learning. | | | | |
| | | | | |

| | | | | |
|---|---|---|---|---|
| 7.) I think my ability with the Internet will affect the grades I get. | | | | |
| 8.) Using computers for schoolwork is a distraction. | | | | |
| 9.) Using computers for schoolwork is more work to learn. | | | | |

**Appendix B: Control Group A Pre- and Post-Test**

Name _____ Period _____

# Quiz 2

1.) Fill in the color wheel with the correct color names.

RED

BLUE      YELLOW

2.) List the 3 primary colors: _____, _____, _____

3.) Why are they called "primary"? _____

_____
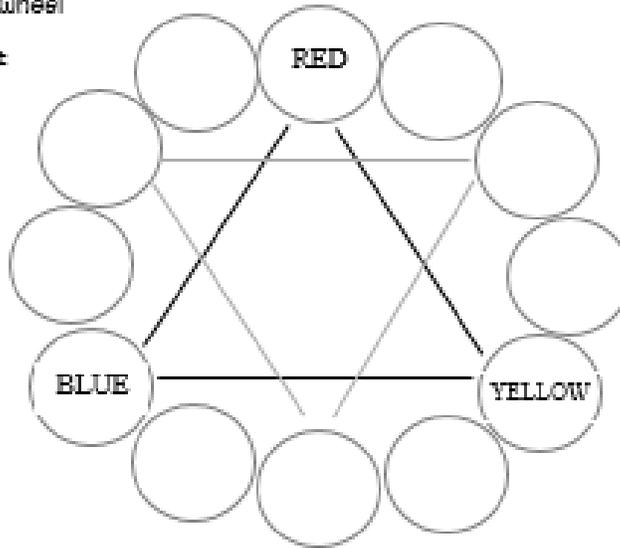
4.) List the 3 secondary colors: _____, _____, _____

5.) List 3 tertiary colors: _____, _____, _____

6.) What is a tint? _____

7.) _____ + _____ = GREEN

8.)     BLUE      +     VIOLET    = _____

9.) _____ + _____ = RED

10.) _____ + _____ = ORANGE

11.) What is the purpose of Pop Art? _____

_____

12.) Who was the Famous Pop Artist who contributed to the movement? _____

**Appendix C: Experimental Group B Pre- and Post-Test**

Name _____ Period _____

## Quiz 2

1.) Fill in the color wheel with the correct color names.

RED

BLUE

YELLOW

2.) List the 3 primary colors: _____, _____, _____

3.) Why are they called "primary"? _____

_____

4.) List the 3 secondary colors: _____, _____, _____

5.) Which color complements violet the best? _____

6.) What is a tint? _____

7.) _____ + _____ = GREEN

8.)      BLUE      +      VIOLET      = _____

9.) _____ + _____ = RED

10.) _____ + _____ = ORANGE

11.) Explain 1 way that color influences what people buy: _____

_____

12.) Give an example of a complementary color scheme in real life: _____

# The Results of Interactive Whiteboard Technology Usage on Oral Reading Rates for Second and Third Grade English Language Learners

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**Abstract**

This research study investigated the effects of the Promethean Interactive Whiteboard on English Language Learners' (ELL) oral reading rates. National and local standardized assessments reveal low reading scores amongst ELLs in comparison to their non-ELL counterparts. These assessments also reveal achievement gaps between the ELL and non-ELL groups. With the rise of diversity in the United States and on Guam, the low standardized assessment scores, and the push to utilize technology in the classroom, stakeholders are searching for ways to improve the assessment scores and close achievement gaps by using technology- including the interactive whiteboard.

The purpose of this study was to determine if there was a significant difference between second and third grade English Language Learners' oral reading rates. This quasi-experimental study was conducted at an elementary school located in the southern region of Guam. Students were divided between the control and experimental groups, with the experimental group receiving the treatment of utilizing the interactive whiteboard in lessons. Results revealed that there were no statistically significant differences in oral reading rates amongst second and third grade English Language Learners. However, higher gains were found amongst the experimental group.

**Background of the Problem**

Marc Prensky, an American author and speaker on education and learning, stated that today's students are drastically different from those of the past — they are no longer the people our educational system was designed to teach. Modern students are now known as digital natives, a term coined by Prensky, to describe a person born after the year 1980 who was raised during the digital age when technologies became available online (Prensky, 2001). Digital natives have some form of access to these technologies and have skills to use those technologies.

Apart from being digital natives, modern students differ from students of the past in another way as well. They are going to schools with more diverse populations. The Los Angeles Times (Frey, 2015) claims that a new Census Bureau report shows that by 2044, the term 'White, non-Hispanic" will no longer comprise a racial majority in the United States. By then, the nation will be made up of a medley of racial groups, including Latinos, Blacks, Asians, Native Americans and multiracial Americans (Frey, 2015). In the United States, the minority ethnic groups are becoming the new majority.

The same can hold true for Guam, an unincorporated territory of the United States located in the western Pacific Ocean. Guam is the southernmost and largest island in the Marianas, as well as the largest island in Micronesia. According to a Census Bureau report (2010) on Guam, the Chamorros, Guam's indigenous people, make up the majority ethnic group of the island's population of 159,358. Other ethnic groups on Guam include: Carolinian ($n$ = 242), Chuukese ($n$ = 11,230), Kosraean ($n$ = 425), Marshallese ($n$ = 315), Palauan ($n$ = 2,563), Pohnpeian ($n$ = 2,248), Yapese ($n$ = 1,263), Chinese except Taiwanese ($n$ = 2,368), Filipino ($n$ = 41,944), Japanese ($n$ = 2,368), Korean ($n$ = 3,437), Taiwanese ($n$ = 249), Vietnamese ($n$ = 337), African American ($n$ = 1,540), Hispanic ($n$ =1,201), White ($n$ = 11,321), and mixed races ($n$ = 404).

Growing diversity in the United States, Guam, and ultimately the Guam Department of Education, means rising numbers of English Language Learners in schools (Flynn & Hill, 2005). The National Council of Teachers of English (2008) defines English Language Learners, or ELLs, as individuals who are learning the English language in addition to his or her native language. ELLs represent the fastest growing group of the school age population in the United States (Flynn & Hill, 2005). Projections suggest that "language minority students" (those who speak a language other than English at home and who have varying levels of proficiency in English) will comprise over 40 percent of American elementary and secondary students by 2030 (National Clearinghouse for Education Statistics, 2005).

It is not uncommon for ELL students to feel anxiety when attending a school where the spoken language is primarily English. Anxiety may arise in different contexts for different students, but many tend to feel anxiety in academic settings because of language barriers (Zgutowicz, 2009). Providing a strong foundation in core subjects can aid ELLs in feeling academic success, thus decreasing their anxiety.

The 2005 United States National Assessment of Educational Progress (NAEP, 2005) indicated that although there has been an increase in achievement scores in reading among ELLs, most students still score below basic. According to the 2005 NAEP assessments of reading and mathematics, 54% of 4th grade ELL students scored at or above reading level in mathematics compared to 83% of non-ELL students in mathematics. It was also reported that 27% of 4th grade ELLs scored at or above grade level in reading compared to 67% of non-ELL 4th graders.

Third grade ELL SAT 10 scores were studied at one elementary school on Guam for the school year 2013-2014. The website "Ready Results" displayed the SAT-10 scores (2014) which indicated that of this elementary school's third grade population of 73, 27 were ELLs. Of those 27 ELLs, 74% ranked in the below basic percentiles on the total reading battery. In comparison, 50% of the non-ELL population received below basic scores. Second grade scores were also analyzed and it was revealed that there were 28 ELL

students in this grade level.  Of these 28 students, 7% scored at the proficient level, 32% at the basic level, and 54% at the below basic level for the reading section of the SAT-10.

Literacy, the ability to read and write (Merriam-Webster, 2015), is seen as a foundational skill in learning (National Literacy Trust, 2015).  The elementary school in this study concentrated on raising reading scores for school year 2013-2014 in hopes of improving reading scores.  More time was allotted to teach the subject of reading.  Students were split into classes based on their reading ability.  The same holds true for school year 2014-2015.  Although the implementation of the Common Core State Standards caused a few changes to be made at this school, the time allotted for reading has stayed the same as well as the decision to group students based on ability level into reading classes.  The thought behind placing so much effort in improving reading scores was that improvement among the other subject areas would follow suit once reading skills are proficient.  The ability to comprehend text is usually the goal of a reading program.  In order to be able to comprehend text, students must first be able to read fluently.  A student can read fluently if the reading of the text is accurate, at the indicated rate, and expressive.  It creates a link between word recognitions and comprehension. Hudson, Lane, & Cullen (2005) state that strong understanding of the alphabetic principle, the ability to blend sounds together, and knowledge of a large bank of high-frequency words are required for word-reading accuracy. The Dynamic Indicators of Basic Early Literacy Skills (DIBELS) has gained widespread use in the United States to measure early reading skills (Riedel, 2007).  The DIBELS test was used at the target school as a means to measure reading rate.

Within the past two years, the Guam Department of Education has issued numerous individual laptops, interactive whiteboards, and other technological devices to assist teachers in educating students.  Interactive whiteboards (IWBs) are being integrated into many classrooms.  Early evidence suggests that IWBs can have a positive effect on teaching and learning.   Existing studies often utilize methods such as focus groups, surveys, and interviews (Armstrong et.al, 2005; Beauchamp, 2004; Glover & Miller, 2001; Ishtaiwa & Shana, 2011; Kennewell et. Al, 2007).  The Promethean Interactive Whiteboard and its accessories were purchased and distributed throughout the Guam Department of Education school system.

Stakeholders in education on Guam are continuously looking for ways to improve test scores and the quality of teaching and learning in general.  The aim of this study is to determine if utilizing technology — or more specifically, the IWB — can solve the problem of low test scores (specifically reading) amongst ELL students on Guam.

**Statement of the Problem**

The National Assessment of Educational Progress (2005) reveals that there is an achievement gap between English Language Learners and non-English Language Learners in Reading. The Guam Standards Based-Assessment and ACT Aspire results for school year 2014-2015 reveal that Reading scores at a target study school are the lowest of the elementary schools on the island of Guam.  Of those scores, English Language Learners scored mostly at below basic. Thirty eight percent of the school's population are ELLs.  Efforts to increase test scores, most especially in Reading, are in effect, such as increasing time allotted to teach reading, professional development and the purchasing of technology to be used in

classrooms. With the addition of technology in the form of interactive whiteboards (IWBs), the consensus is that the student interaction with technology might increase reading scores as well.

The research question for this study is: Is there a significant difference in the mean oral reading rate scores between English Language Learners taught in classrooms utilizing the interactive whiteboard compared to those classrooms that do not?

**Significance of the Study**

This study is significant because it is the initial study done on Guam analyzing the differences between performance in classes that use the interactive whiteboard technology and classes that do not. This study is also significant because, although there were no statistically significant differences, the experimental group revealed a higher gain score than the control group. This study is worth duplicating on a larger scale because of the results. By doing so, stronger insights may arise in regards to utilizing IWB technology to enhance reading rates. Future investigations may add to the existing research done on IWBs.

**Some Views from the Literature**

*Reading Fluency*

Teaching students to be literate is a high educational priority in the United States, but it is also considered one of education's biggest challenges. Becoming a proficient reader is already a challenging task for non-ELLs, and is much more difficult when English is the second language of the individual (Ybarra & Green, 2003). One of the main challenges that schools in the United States face today in educating English Language Learners is developing their academic literacy (Warschauer, 2004). Vaughn, Mathes, Linan-Thompson, & Francis (2005) state that "an indication of developing literacy skills is the ability to comprehend text." Skills such as phonemic awareness, letter knowledge, and word recognition are essential in developing skills that will lead to better comprehension (Vaughn, et.al, 2005).

Reading comprehension, often considered key to developing reading skills, is defined by Duke & Pearson (2002) as the "ability to draw on decoding skills, prior experiences, and vocabulary to understand text." Reading fluency is defined as "the ability to read text accurately and quickly" (Armbruster, Lehr, & Osborn, 2001, p.22). Allington (1983) states that the development of reading fluency has been regarded as the most neglected goal in our country's elementary schools. In order to comprehend a text, therefore, one must first be a fluent reader. Reading fluency can be assessed in many ways. One tool is the Dynamic Indicators of Basic Early Literacy Oral Reading Fluency (DIBELS ORF, or DORF). There are statistically significant positive correlations between third grade students' scores on the DORF and state-mandated assessments of reading (Riedel, 2007). Riedel explains that, while the study does not directly address the question of why the DORF is more highly correlated with reading comprehension than are other DIBELS subtests, a number of possible theories arise as to how her study achieved high correlations. She reported that the ability to read connected text rapidly and accurately may play a crucial role in one's ability to comprehend text, resulting in a close relation between comprehension ability and reading rate measures. In the same vein, LaBerge and Samuels' (1974) automaticity model of reading has oral reading fluency as an indicator for overall reading competence. Their automaticity model of reading used the concept of

automaticity to explain why fluent readers are able to decode and beginning readers have difficulty. This model is important because it gives insight explaining the struggles of beginning readers.

Conclusions made by Paleologos (2005) indicate that the DORF is a good predictor of standardized test performance, particularly in reading and math, for students who are disabled or are English Language Learners. Paleologos states that "the use of a formative assessment such as DIBELS ORF can aid teachers in their attempt to foster strong literacy skills within their students" because the assessment allows teachers to document the progress of student reading fluency. Consequently, teachers can determine which student is progressing and which student may need intervention.

By understanding what reading fluency is and its importance in learning, teachers may then explore means of teaching reading fluency. One of those means is by utilizing IWB technology.

**Interactive Whiteboard Technology in the Classroom**
Many studies (Hussain & Akhtar, 2010; Hwang, Wu, & Kuo, 2013; Digregorio & Sobel-Lojeski, 2010; Lopez, 2010) have indicated that computer use in the classroom has had positive effects on the learning process in comparison to classes who used computers less or failed to use it at all.

Interactive Whiteboard (IWB) technology, which are now touch-screen devices, are more efficient than ever if teachers use it to its full capacity (Hwang et.al, 2013). Manipulators of the whiteboard have a variety of resources to make the board interactive, especially when the inclusion of Internet resources is added (Hwang et.al, 2013). The Promethean IWB, for example, is connected to a projector and computer. The computer screen is displayed on the board. A magnetic pen is used to manipulate the board, although more recent boards are touch-screen. A software is downloaded onto the computer and is used with the board. The software used in this study was ActivInspire. Teachers can create a variety of engaging activities and lessons called flipcharts. Flipcharts are also available for download on many websites, one being Promethean Planet. The Promethean IWB is equipped with its own sound system and video can also be recorded on the IWB. Accessories include the ActiVote which is an interactive responder in which all students can communicate answers to problems that teachers pose on the board.

Kennewell, Tanner, Jones, and Beauchamp (2007) state that the IWB provides a variety of benefits that include: (1) replicating the functions of older presentation technologies such as flipcharts, overheads, slide projectors and videos; (2) facilitating the manipulation of text and images for the class; (3) allowing creative and dynamic integration of Web-based materials; (4) providing indefinite storage space, quick retrieval of materials and immediate feedback; (5) viewing content as a group; (6) using software in classroom without being tied to a computer; (7) creating digital lesson activities with templates, images and multimedia; (8) writing notes over educational video clips; (9) and using presentation tools that are included in the software to enhance learning materials (Kennewell et.al, 2007). Almost anything that can be done on a computer can also be done on an IWB (Ishtaiwa & Shana, 2011).

ELLs enter school with a wide range of language proficiencies and subject matter knowledge. They differ in educational backgrounds, expectations of schooling, socioeconomic status, age-of-arrival, and personal experiences (Lopez, 2010). Some important strategies to use when teaching

ELLs include: building on previous knowledge and incorporating ELL's prior knowledge; providing opportunities for ELLs to interact with teacher and peers; integrating different contexts in ELL strategies; contextualizing instruction and using strategies such as graphic organizers that support ELL's development of higher order skills; and providing immediate feedback.

Features of IWB technology allow students to annotate, conceal, manipulate, move and zoom in on or focus on images and text. Kennewell, et.al (2007) states that students must be allowed to use IWB technology themselves.  He believes that classes will be more enjoyable when students are actively moving about and concentrating on the lesson.  This leads to improved attention and behavior which are factors that lead to improved academic achievement (Beeland, 2002).

According to Lopez (2010), many teachers that use IWBs in their classroom support the claim that technology encourages student learning because of its multimedia and multi-sensory capacity. For example, teachers have reported that an IWB's capacity to present stimulating visual images enhances students' recall of information. Classrooms with IWB technology can help ELLs in the learning process by making available multimedia, simulations, and modeling. Because of this, IWBs can appeal to all three sight, sound, and touch simultaneously through a variety of visual representations, sounds, and the ability to touch and interact with the board.

According to Schmid (2006) classrooms with IWB technology can also provide ELLs with helpful feedback that can enhance students' learning.  For example, the ActiVote response device allows students to answer a question by pressing one of five buttons as if answering a multiple choice question.  Results are indicated on the board.  If the teacher chooses, results can be analyzed so that the teacher knows who answered correctly or incorrectly.

The IWB has a large display that is usually the focal point in the classroom.  This encourages a high level of student interaction.  A teacher and a student can interact with the IWB technology at the front of the class and the rest of the students remain involved. As research indicates, the functionality of the IWB and its accompanying software allows for the development of classroom activities that are engaging for students, so they encourage greater focus, participation and interaction, and improve student learning outcomes as a result. (Basmah, 2012).

A multimedia interactive training center at the Centre for Educational Studies at the University of Hull, Scarborough, UK, spent two years looking at the identification of effective practice in over 200 classroom observations in schools and colleges throughout England. One of the questions that guided their work was, "What are the advantages of using an interactive whiteboard for teaching literacy?" (Painter, Whiting, & Walters, 2005). The Cascade researchers reported that many teachers reported being able to control the software that is used with the whiteboard and as they interacted with the whiteboard, the use of the IWB helped students visualize and remember concepts, and process information and ideas. In addition, using sound and video clips on a whiteboard can also enhance literacy teaching. Being able to see and hear text spoken can be very beneficial as well for many students (Walker, 2002).

Olsen (2010) argues that IWB technology is a valuable tool when used correctly.  It can greatly supplement any computer technology used in the classroom. Motivation in this paper will be defined as a person's reason for doing something.  Ur, Williams, and Wright (1996) state that motivation as an abstract word is not easy to define. They claim that teachers should think of the term ´motivated learner´ as someone who "wants to put some effort in his or her learning in order to gain knowledge of new facts". Brezinova (2009) states that by allowing students to come to the front of the classroom and demonstrate their knowledge by completing a diagram, a sentence or a picture, it will enhance students' motivation. Levy (2002) argues that IWB's motivate students to answer teachers' questions due to the strong visual and conceptual appeal of the information that is displayed, and because of the way they allow students to physically interact with the board in search of those answers. Interactive whiteboards usage allow teachers to access many online games and have students compete with one another.  The "dual user" function of the interactive whiteboard allows students to work on the interactive whiteboard at the same time.

Research shows that the interactive whiteboard serves as an aide to students who have difficulty developing mental images of complicated concepts (Kennewell et al., 2007). Real situations can be shown using the interactive whiteboard together with the use of the Internet.  Not only can the children be shown pictures on the topic, but they may also be able to view videos about those topics. (Brezinova, 2009)

IWBs provides conveniences for teachers. When using the interactive whiteboard, teachers can easily save items and open them whenever needed with ease (Brezinova, 2009).  The same holds true for whole lessons.  Teachers can easily teach previous lessons to students who missed the course due to an absence.  Teachers no longer have to erase notes from the board in order to make room for more information.  Many ELLs have trouble copying from the board and comprehending simultaneously, so notes and visuals can be saved for students to look at in the future. Teachers are able to save note files and post them to a website or print them out. The ability to go back and forth between different pages on the IWB software helps students make meaningful connections between content.

Common contextual factors also need to be taken into consideration because it helps explain the direct and indirect links between the IWB usage and student learning and achievement (Digregorio & Sobel-Lojeski, 2010).  These factors include: school culture, technical support, teacher training, teacher confidence, and time for teachers to prepare and practice lessons.  Wall, K., Higgins, S., & Smith, H. (2005) state in their study of metacognition that students described positive feelings toward the usage of the IWB because of its ability to motivate, aid concentration, and keep their attention. The usage of IWB technology, along with other technological devices, can provide scaffold for language development (Warschauer, 2004).

The use of IWBs has been reported as ranging from teacher centered, or presentational, to methods which are more student centered, interactive and collaborative (Northcote, Mildenhall, Marshall, & Swan, 2010). Teachers are seen as critical agents in digital learning classrooms that utilize IWB technology.  Because many schools are calling for teachers to create lessons which are student-centered, teachers should act as facilitators of learning.  Glover and Miller (2001) state that IWBs may reinforce

teacher-centered learning if participants fail to truly appreciate the interactivity of the device. One challenge a teacher may come across when working with IWB technology is how to effectively manipulate the IWB without becoming too involved in the lesson and interfering with student productivity and interaction. Four IWB teaching and learning factors — IWB supported Teaching, IWB Student Learning, Teacher Supported Learning, and Student Interactive Learning — were found to be significantly associated with each other (Liang, Huang, & Tsai, 2012). Schmid (2006) adds that it is the negotiations between students and teacher regarding how IWB technology should be used ultimately leads to student achievement amongst ELLs. One of the major challenges encountered with high-technology classrooms is utilizing these devices to aid in transitioning ELLs from learning to read to reading to learn (Warschauer, 2004).

When teachers have a wide range of subject-specific software and multimedia resources such as Flash, DVDs, video-conferencing, and the Internet (Armstrong, Barnes, Sutherland, Curran, Mills, & Thompson, 2005; Hussain, Iqbal, Akhtar, 2010), it improves the capability of the teaching process because students are more attentive and responsive to these technologies. Other components that may aid the usage of the interactive whiteboard are tablets, web cameras, speakers and teacher microphones for audio enhancement, and student response systems such as the ActiVote. By using these accessories, classes can experience electronic field trips, hold video conferences with other classes, or conduct research with experts at universities.

Probably two of the most definitive works were those conducted by Marzano (2010) and Lopez (2010). Marzano conducted a multi-year study involving 27 public schools in 20 cities in 14 states with over 5,000 students included in the sample. The objectives of this study were to analyze the impact of using interactive whiteboards on student learning and to analyze teacher behaviors as related to the use of technology. Eighty-five treatment/control studies were compiled the first year and were followed up with an additional 46 treatment/control studies the second year. The findings of Marzano's (2010) study indicated a gain with the use of the interactive whiteboard.

Lopez's study analyzed the effects interactive whiteboard usage had on academic achievement as well. A school district in Texas — Round Rock Independent School District — identified significant differences in the achievement level of ELL and non-ELL students thereby implementing the Digital Learning Classroom initiative in the third and fifth grade levels in three schools for mathematics and reading/English language arts instruction (2010). The objectives were (1) to determine whether the interactive whiteboards could reduce the achievement gaps between the two groups in these classrooms and (2) to determine whether the ELL students in the Digital Classroom would perform better than the ELL students who were not in these classrooms. Teachers worked with a curriculum specialist on developing instructional resources for the whiteboards and an instructional technology specialist on mastering the skills needed to use the equipment effectively. In Lopez's study, the results indicate that ELL students in the Digital Classrooms made more significant gains than those in regular classrooms. In addition, ELL students in the Digital Classrooms outperformed their counterparts in regular classrooms. The researchers attribute these gains to the multimedia classroom and also to pedagogical changes made by the teachers in using the technology. The assessment that was used in this study was the 2006 Texas Assessment of Knowledge and Skills also known as the TAKS. The study's t-test analysis showed a higher

TAKS mean score in reading of 2309.4 for ELL students in the Digital Learning Classroom compared to 2232.9 for ELL students in traditional classrooms. The t-test statistic indicated significant statistical difference in the score means between these two classroom types at the p<.05 level.

The case studies conducted by Armstrong, et al. (2005), demonstrate the importance of teachers having long-term sustained engagement with the IWB technology. Experienced IWB users with access to IWBs on a daily basis were able to exploit more of the possibilities of IWB technology than were inexperienced users of the IWB who used it simply as an extension of a regular whiteboard and multimedia projector. As the teacher becomes more confident in using the IWB, so does the student (Beauchamp, 2004).

With the push to integrate technology — especially with the recent distribution of the interactive whiteboard in the Guam Department of Education — into curriculum and the need to improve reading standardized assessment scores, using the interactive whiteboard may be a key factor in accomplishing these to tasks. According to the Guam Department of Education Research, Planning, and Evaluation office, there have not been any studies done regarding interactive whiteboard usage and student achievement (Guam Department of Education Research, Planning, and Evaluation Office, 2015).

**Methodology**

*Statement of the Problem*

The National Assessment of Educational Progress (2005) reveals that there is an achievement gap between English Language Learners and non-English Language Learners in Reading. The Guam Standards Based-Assessment and ACT Aspire results for school year 2014-2015 reveal that Reading scores at the target study school are the lowest of the elementary schools on the island of Guam. Of those scores, English Language Learners scored mostly at below basic. 38% of the school's population are ELLs. Efforts to increase test scores, most especially in Reading, are in effect, such as increasing time allotted to teach reading, professional development and the purchasing of technology to be used in classrooms.

*Purpose of the Study*

The purpose of this study was to examine the differences in oral reading rate scores amongst second and third grade English Language Learners in classrooms utilizing interactive whiteboard technology and classrooms that did not. The independent variable in this study is the usage of the interactive whiteboard. The dependent variables are the DIBELS ORF test scores.

*Research question*

Given the information collected in the review of literature, this study was guided by the following question: Is there a significant difference in English Language Learners' reading rate scores between classes that use interactive whiteboards and classrooms that do not?

*Hypothesis*

*Null Hypothesis*

The null hypothesis of this study was that there would be no significant difference in English Language Learners' mean oral reading rate scores between the experimental group (English Language

Learners taught utilizing interactive whiteboards) and the control group (ELL students taught using traditional methods).

$$H0: \mu1 = \mu2$$

*Alternate Hypothesis*

The alternate hypothesis of this study was that the mean posttest score of the experimental group ($\mu1$) would be higher than that of the control group ($\mu2$).

$$H1: \mu1 > \mu2$$

*Participants*

Twenty participants in total were second with (n = 6) and third grade (n = 14) English Language Learners who attended an ethnically diverse public elementary school in the southern region of Guam. The ethnic breakdown of the study sample was as follows: 60% Chuukese, 30% Chamorro, and 10% Filipino. There were ten male participants and ten female participants. (See Table 1).

The 20 participants were split up into two groups, with 10 students in each group. One group (the experimental group) learned lessons through the use of the interactive whiteboard while the other group (the control group) used traditional methods to learn the concepts taught.

**Table 1** *Demographic Characteristics of the Participants*

| Characteristic | | Number | Percent |
|---|---|---|---|
| Gender | | | |
| | Girl | 10 | 50 |
| | Boy | 10 | 50 |
| Current grade level | | | |
| | Second | 6 | 30 |
| | Third | 14 | 20 |
| Ethnicity | | | |
| | Chuukese | 12 | 60 |
| | Chamorro | 6 | 30 |
| | Filipino | 2 | 10 |

*Design*

A pretest-posttest quasi-experimental design was used for this study. Two groups (English Language Learners and non-English Language Learners) were compared and the degree of change occurring as a result of treatments was measured. The pretest and posttest used was the Dynamic Indicators of Basic Early Literacy Oral Reading Fluency (DIBELS ORF) for the second and third grades.

Measures of central tendency were analyzed using the IBM Statistical Package for Social Sciences (SPSS). In addition, an independent samples t-test was used to determine whether there was a statistically significant difference between the two groups.

*Procedure*

Permission from the University of Guam Institutional Review Board, Guam Department of Education, the participating school principal, and parents/guardians of the participating subjects were granted before this study commenced (See Appendix A-E).

As stated earlier, twenty ELLs from the second and third grade levels at an elementary school on Guam participated in this study. Students were randomly placed into one of two groups. The experimental group received instruction in reading strategies to improve reading rate through the use of the interactive whiteboard and Internet, while the control group received instruction on the same content using traditional teaching methods.

A pretest (See Appendix E and Appendix F) was administered at the beginning of school year 2015-2016 to both groups. The groups were taught separately after school for two days − a 45-minute lesson each day. This continued for five weeks for a total of ten sessions. At the end of the lessons, a posttest was administered. Results were then analyzed.

**Results**

*Purpose of the Study*

The purpose of this study was to determine if a significant difference exists between second and third grade English Language Learners' oral reading rates at a Guam Department of Education elementary school located in southern Guam. The null hypothesis for this research was that there would be no significant difference in oral reading rate scores amongst the second and third grade English Language Learners.

*Statistical Analysis*

The results using the SPSS t-test revealed the following results for each section of academic achievement skills assessed using the DIBELS ORF. In order to show a significant difference, the results needed to show a p-value of >.05.

An independent samples *t*-test was conducted to compare the oral reading rate mean scores between the control group (classrooms that used traditional methods) and the experimental group (classrooms utilizing interactive whiteboards) (See Table 2).

Levene's test for equality of variances indicated equal variances (F= .090, p= .767) so equal variances is assumed.

Results indicate that there was no significant difference in the scores for the control group- classrooms utilizing traditional teaching methods without the use of the interactive whiteboard- (M=86.2 , SD=31.5) and the experimental group- classrooms utilizing interactive whiteboard technology (M=88.4 , SD=40.2 ); t(18)= -.14, p = 0.89.  The null hypothesis is, therefore, retained (See Table 2).

**Table 2** Independent Samples t-test of the Control and Experimental Groups

|  | Levene's Test for Equality of Variances | | t-test for Equality of Means | | |
| --- | --- | --- | --- | --- | --- |
|  | f | Sig. | t | df | Sig.(2-tailed) |
| Equal variances assumed | .090 | .767 | -.136 | 18 | .893 |
| Equal variances not assumed |  |  | -.136 | 17.029 | .893 |

*Gain Scores*

Although the results revealed that there were no statistically significant differences between the experimental and control groups, there were higher gain scores for the experimental group.  The mean of the pre-test scores for the control group was 82.8 words per minute.  The mean of the post-test for the control group was 86.2 words per minute.  The mean of the pre-test for the experimental group was 81.6 words per minute and the mean of the post-test for the experimental group was 88.4 words per minute. The control group had a gain score of 3.4 while the experimental group had a gain score of 6.8 (See Table 3).

**Table 3** Means and Standard Deviations of the Control and Experimental Groups

| Group | N | Mean | SD | Gain |
| --- | --- | --- | --- | --- |
| Control |  |  |  |  |
| Pretest | 10 |  |  |  |
| Posttest | 10 | 86.2 | 31.5 | +3.4 |
| Experimental |  |  |  |  |
| Pretest | 10 |  |  |  |
| Posttest | 10 | 88.4 | 40.2 | +6.8 |

**Discussion**

*Summary*

This research study investigated the effects of the Promethean Interactive Whiteboard on English Language Learners' (ELL) oral reading rates. National and local standardized assessments reveal low reading scores amongst ELLs in comparison to their non-ELL counterparts. These assessments also reveal achievement gaps between the ELL and non-ELL groups. With the rise of diversity in the United States and on Guam, the low standardized assessment scores, and the push to utilize technology in the classroom, stakeholders are searching for ways to improve the assessment scores and close achievement gaps by using technology- including the interactive whiteboard.

*Limitations*

There were several limitations in this study. The limitations include: (1) small sample sizes, (2) short durations of experimental treatment and low amount of sessions, and (3) absences amongst participants due to lack of transportation after school. At the beginning of this study, 27 students agreed to participate in this study. Seven students dropped out of the study due to lack of transportation after school. Of the 20 remaining participants, three students were absent at times. The researcher tried to have these students catch up with lessons they missed by teaching the lesson during lunch time.

*Recommendations*

The researcher would recommend trying to get a larger sample size to show a truer picture of the effects of interactive whiteboard usage in classrooms. The researcher would also suggest gathering data over a longer period of time. Participants in this study received instruction for a total of ten 45-minute sessions. The results reveal a larger gain score for the experimental group at the end of the study. Should the sample size increase and the duration of the study be lengthened, stronger insights may arise regarding how effective interactive whiteboards are on the reading rates of ELL students.

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## *ORF Progress Monitoring 1*

### A Present From Me

|   |   |
|---|---|
| I wanted to take my stepmother out to dinner for her birthday | 12 |
| and pay for our dinner with my own money. I wanted it to be a | 27 |
| surprise and I wanted it to be just from me. The problem was, I | 41 |
| didn't have any money! | 45 |
| I went out to try to find ways to earn money. The lady who | 59 |
| lives in the apartment upstairs said she wanted to get rid of all | 72 |
| her empty soda cans and bottles. She said I could keep the | 84 |
| money for the deposit if I took all of the cans and bottles back to | 99 |
| the store. It took me five trips, but I got them all taken back to | 114 |
| the store. | 116 |
| The man in the apartment downstairs said I could walk his | 127 |
| dog after supper every night for two weeks. Our neighbor lady | 138 |
| said she could use some help putting out the trash and getting rid | 151 |
| of old newspapers. One lady in our building said she would like | 163 |
| some help with her groceries, but she couldn't afford to pay me. | 175 |
| I helped her anyway. She said she would give me some flowers | 187 |
| to give to my stepmother. | 192 |
| The day before her birthday I asked Mom if she would go on | 205 |
| a date with me for dinner. She was surprised when I paid for the | 219 |
| dinner with the money I had earned. She made me tell her where | 232 |
| I had gotten the money. Then she gave me a big hug and said it | 247 |
| was the best birthday present ever. I think she liked the flowers | 259 |
| the best of all. | 263 |

Total words: _____ − errors: _____ = words correct: _____

Retell:                                 ORF Total:_____

```
1  2  3  4  5  6  7  8  9  10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71
72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94
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Retell Total:_____

Page 3

3<sup>rd</sup> Grade DIBELS ORF

## *ORF Progress Monitoring 1*

### Riding the Bus to School

|  |  |
|---|---:|
| I ride a big yellow bus to school. I stand on the corner of our | 15 |
| street with my friends and we wait for the bus. My friend's | 27 |
| grandma waits with us. When it's raining, she holds an umbrella | 38 |
| to keep us dry. Sometimes when it's cold she brings us hot | 50 |
| chocolate. | 51 |
| I leave my house to walk to the bus stop after my parents go | 65 |
| to work. I watch the clock so I know when to leave. Sometimes | 78 |
| mom phones me from her office to remind me. Sometimes she | 89 |
| can't call, so I have to be sure to watch the time. | 101 |
| Our bus driver puts his flashing yellow lights on and then | 112 |
| stops right next to us. When he has stopped he turns the red | 125 |
| lights on so all the cars will stop. He makes sure we are all | 139 |
| sitting down before he starts to go. He watches out for us very | 152 |
| carefully. | 153 |
| My friends and I are the first ones to be picked up by the bus. | 168 |
| We like to sit right behind the bus driver and watch while he | 181 |
| picks up all the other kids. We know where everyone lives. By | 193 |
| the time we get to our school, the bus is almost full. Sometimes | 206 |
| the kids get noisy and the driver has to remind us to keep it | 220 |
| down. He says their noise makes it hard for him to concentrate | 232 |
| and drive safely. I am glad that our bus driver is so careful. | 245 |

Total words: _____ – errors: _____ = words correct: _____

Retell: _____                    ORF Total:_____

| 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 |
| 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 |
| 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 |
| 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 |

Retell Total:_____

Page 3

ACADEMIC RESEARCH

# Survey and Analysis of Online Learning Experiences and Expectations Among University of Guam Teacher Candidates

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**Abstract**

The University of Guam is acutely aware of the potential benefits and accessibility that online learning offers the Pacific region. In order to provide the best and most needed services to students and the community the university needs to know what students want and what they need in order to be successful students. This study reports the responses of 256 of 716 currently enrolled School of Education students at University of Guam regarding their experience with and preferences for online and blended learning classes.  It addresses student needs regarding programs and classes and what helped them succeed as well as what was difficult and needs to be changed.  It also asks for input on future online offerings and whether students would enroll in an online or blended doctoral program for educators at University of Guam.

Technology today has an enormous influence on teaching and learning and e-learning is emerging as a major factor in higher education (Eggen & Kauchak, 2010).  The U.S. National Center for Educational Statistics states that the percent of students enrolled in online learning classes has doubled and tripled in recent years and the upward trend is growing (2016).  Online learning, e-learning and distance learning are terms often used interchangeably and, generally the terms mean using a computer and the Internet to deliver part, all or part of a course's content  no matter what the setting - university, high school or part of a professional training course (Virtual College, 2016).

**Background**

The University of Guam (UOG) is working to offer the types of programs and classes that meet the needs of its School of Education (SOE) students as well as the community at large, but to do so effectively UOG must find out what students want and need and determine how best to help them succeed.  One avenue that is increasingly popular nationally and internationally is that of electronic learning (Educause, 2016).  As the School of Education advances into the online learning community, there is a need to know

what would entice potential students to choose online or blended courses provided by UOG and what would help them succeed, persevere with their program of study, and ultimately graduate as education professionals.  How can the highest quality online programs and most needed courses be presented so that students will choose UOG over competitive distance programs?

Most colleges and universities are offering an increasing number of graduate, undergraduate and certificate programs online.  Not only are the number and types of courses available expanding, but demand for these courses is increasing as well (Roblyer, 2006).  The 2016 report of the National Center for Education Statistics (NCES) reported that during the previous year 2,862,991 students had taken at least one online course and 2,659,203 were exclusively online students (NCES, 2016).  In order to meet the evolving demands of students today, to remain competitive in the future and to promote University of Guam as not only the natural choice for the Northern Pacific region students, but the best choice, it must provide the online programs students want and in a way that promotes greatest student success.

**Some Research Views**

Many studies have been done on the benefits and detriments of online learning.  Not every program is successful; however, countless reports and surveys have shown that the online learning industry as a whole is growing and expanding (Pappas, 2015).  Although there are failures, the worldwide online market has a growth rate of almost 36% per year (Sun, Tsai, Finger, Chen, & Yeh, 2008). There is significant pressure from many fronts, both internally and externally, for higher education's teaching and learning to adapt to the reality of online learning and to incorporate an e-learning design into their mission (Riddell, 2016).  Although there are always challenges, when done properly, the inclusion of online learning into the regular university curriculum can occur without chaos.  This allows the university to take advantage of the many benefits of online education (Morris, 2016).

*Changes in the education landscape*

There is also a growing pressure on institutions of higher education to provide differentiated paths to education (Hilton, 2015).  In her article about technology trends on university campuses, Riddell quotes R. Clemmons, CIO at St. Norbert College who says "I strongly suspect that the four-year college education of the (not too distant) future will be a nicely blended version of the two [traditional and online] that looks very little like either extremes do today," (2016, p.3).  Parr adds that in today's traditional classrooms, students have only limited time with experts but with new technological advances they can have access to supporting media and even virtual imagery to support learning (2014).  In addition, students today have access to numerous formal and informal learning platforms and applications (apps) including social media. Web access using mobile devices continues to expand rapidly and connectivity via smartphones nearly quadrupled between 2009 and 2014 (Morrison, 2016).  With such greatly improved ease of accessing online information and media, students demand traditional alternatives (Morrison, 2016).

*Student success*

Some concern has been expressed that students who take online courses are less successful at completing coursework and may learn less even if they complete the class and receive a passing grade. However, a study of online learning conducted by the U.S. Department of Education in 2009 reports that, on average, students in the online setting performed higher than those in a traditional setting (Wilson & Allen, 2010).

An important factor influencing student success with online learning is their ease of access to the Internet and course content especially through personal devices and apps.  With greater online accessibility students are able to study more independently supported by easy access to information through personal devices (Parr, 2014).  Student use of technology tools, apps, smartphones, and other technological developments can have a major impact on the success of university students (Riddell, 2016).  Student expectations about their courses and their instructors can also have an impact on their academic success.  A study by Paechter reports that students' belief in the importance and quality of the academic course as well as their own achievement goals has an influence on course completion rates (2010).  Likewise, students who believed their instructors were highly knowledgeable and offered personal support were most likely to learn and succeed and to experience a high level of course satisfaction (Paechter, Maier & Macher, 2010).

Technological innovations and greater access to the internet and course content are important factors in promoting student success with online learning, but the challenge is not simply integrating new technologies.  It is important to look at course content itself and teaching methods that may need to change fundamentally with the use of technology (Miller, 2007) (Technology and Diversity).  Many studies comparing teaching online with traditional classroom teaching indicate the following to be true (Williams, Paprock, & Covington, 1999).(Tech and Diversity):

- Quality of learning online is as good as or better than traditional modes
- Students tend to be highly motivated, often because of appreciation for the opportunity afforded due to online scheduling or because of greater convenience with personal schedule.
- Instructors are better prepared and more well organized
- Instructional resources are enhanced
- Collaborative learning is encouraged

*Barriers to success*

Universities and course instructors also need to understand the needs of increasingly diverse students.  Melles (2012) states that "Research has shown that students can be stopped from learning effectively online because of administrative issues, social interactions, academic skills, technical skills, learner motivation, time and support for studies, cost and access to the internet and technical problems (p.2).  Touro College (2014) supports this list, but adds that overall college costs can also be a major factor.  Their research shows that the average total cost of a traditional degree is about $85,000, but the average total cost of an online degree is about $30,000 (2014).

*Programs offered*

Online students, like traditional ones, look for courses and programs that meet their academic needs and professional goals.  The most frequently sought after degrees via the traditional setting are (a) Business, (b) Accounting, (c) Nursing, (d) Psychology, and (e) Education.  The most frequently offered online degrees are 1) Psychology, 2) Business, 3) education 4) Nursing, and 5) Health Administration (Touro College, 2014).  The most frequently requested programs of study are very much the same for traditional students compared to online students.

There is great educational promise offered through technology and online learning, but universities must proceed with the understanding that learners' needs and preferences are the major driving forces. Competitive universities are expanding their online offerings (Morrison, 2016). According to Hilton, "We have the opportunity right now in higher education to build the world's largest living learning laboratories, as increasingly the interaction between content and activity is mediated by technologies and the internet," ( 2015, p.7).

In response to the technology trend that demands UOG offer online programs in order to remain competitive, a study that looks at factors that may increase or diminish students' ability to succeed in those programs becomes an essential tool in determining the future path of online learning at UOG. This study is designed to listen to the voice of UOG's students to determine what is going well, what needs to improve, and what direction the students wish to travel in the future.

**Method**

An online survey (using Qualtrics) was administered to 236 of University of Guam's 716 graduate and undergraduate students enrolled in SOE during academic year 2015 – 2016 (Olivares, 2016). This number of participants who voluntarily completed the online learning survey represents a 95% confidence level with a 5% confidence interval that responses are representative of SOE students at large. Following validation, the survey was made available online to SOE classes. Data was collected anonymously, and Qualtrics separated information from students who had taken fully online courses (n = 130), hybrid/blended courses (n = 49), or who had never taken an online or hybrid/blended class at all (n = 57). Hybrid and blended courses are interchangeable terms referring to courses delivered using face-to-face and online hours. For the research questions and for reporting purposes of the data analysis, the term "blended" classes will be used hereafter. Results were compiled and aggregated using an Excel spreadsheet. Findings and conclusions were drawn using descriptive statistics and reported to address five research questions.

*Research Questions*

1. What do SOE students at UOG find most helps them succeed in online and blended courses?
2. What do SOE students at UOG find most difficult about taking online and blended courses?
3. What would entice students to choose an online or blended class from UOG rather than one from a competing university?
4. What courses or programs do SOE students at UOG most want to be offered online?
5. Would SOE students at UOG enroll in an online or hybrid doctoral program should the program become available?

*Limitations*

While this survey attempts to gather data from as many students as possible, anything less than 100% of the populations involved leaves some room for error or omissions. Survey responses were gathered anonymously online so there was no need for students to be less than entirely honest in their responses, yet there is always that possibility. Data was collected from survey participants regardless of learning institution where the online course had been offered as their overall online experience was the

aim of this study. Therefore no conclusions can be made for a specific institution or instructor at an institution.

**Findings**

*Demographics*

    *Participants' college level*

    Survey participants were separated into three groups based on the type of courses they have taken. Group A (n = 130) consists of the students who have taken fully online courses (not including blended). Group B (n = 49) includes students who have taken blended courses (no fully online), and Group C (n = 57) consists of students who have never taken a fully online or blended course. Table 1 provides a breakdown of these students by college level—undergraduate and graduate.

**Table 1** Students' College Level: Frequency and Percent of Students, N = 236

| Students by Groups | N | Undergraduate | | Graduate | | No |
|---|---|---|---|---|---|---|
| | | # | % | # | % | Response |
| Group A: Fully online students | 130 | 82 | **35%** | 47 | 20% | 1 |
| Group B: Blended students | 49 | 19 | 8% | 26 | 11% | 4 |
| Group C: Non Online/Blended Students | 57 | 46 | 19% | 11 | 5% | 0 |
| Total | 236 | 147 | 62% | 84 | 36% | 5 |

    Table 1 shows that more than half of the survey participants (62%) were undergraduate students, and 36% were graduate students. Five students did not indicate their college level. The category with the highest percent of students is made up of undergraduate students who have taken a fully online course (35%), while the category with the lowest percent of students are those who have never taken an online or blended course (5%).

    *Online college level courses taken*

    Of the 130 students in Group A who indicated they have enrolled in fully online courses, they were then asked how many fully online college level courses they have taken. Table 2 provides a breakdown of their responses.

**Table 2** Online College Level Courses Taken – Frequency and Percent of Students, N = 130

| # of Courses | | # of Students | % |
|---|---|---|---|
| 0 | | 4 | 3% |
| 1 | | 62 | 48% |
| 2 | | 28 | 22% |
| 3 | | 14 | 11% |
| 4 or more | | 22 | 17% |
| Total | | 130 | 101%* |

\* Total percent may be higher than 100% due to rounding individual percent values.

    Table 2 shows that almost half of the 130 students (48%) have taken only one fully online college level course, while 33% have taken two to three courses, and 17% have taken four or more courses. Three percent of the students took fully online courses that were not college level courses.

*Blended college level courses taken*

Of the 49 students in Group B who indicated they have taken blended courses, they were then asked how many blended college level courses they have taken. Table 3 provides a breakdown of their responses.

**Table 3** Blended College Level Courses Taken, Frequency and Percent of Students, N = 44*

| # of Courses | | # of Students | % |
|---|---|---|---|
| 1 | | 16 | 36% |
| 2 | | 8 | 18% |
| 3 | | 7 | 16% |
| 4 or more | | 13 | 30% |
| Total | | 44 | 100% |
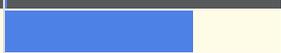
* Five out of the 49 Group B students did not respond to this item.

Table 3 shows 36% of the 44 students have taken only one blended college level course, while 34% have taken two to three courses, and 30% have taken four or more courses.

*Research Question 1: What do SOE students at UOG find most helps them succeed in online and blended courses?*

The survey items addressing this research question were open ended questions asking the students to list the factors they liked best about online and blended courses, which, in turn, helped them the most to succeed in these courses. For each group (online and blended students), their responses were examined and compared for similarities and then aggregated and coded to identify themes in the responses.

*Group A (fully online)*

The survey item generated 98 responses addressing research question one for students who had taken fully online courses. One overwhelming theme emerged with 77 coded responses as the students emphasized convenience and flexibility of online courses as what they liked best, which, in turn, contributed most to their success in the fully online courses. The remaining 21 responses referred to different factors with only one more theme emerging: access to course information, with eight coded responses.

*Convenience and flexibility.* The theme "convenience and flexibility" garnered 77 coded responses, which included being able to work at one's own pace, course accessibility during any time of the day, being able to work at home, and accommodating fulltime jobs. Students liked being able to work at their own pace because they were able to do their coursework around other personal and professional responsibilities. As Student A11 explained, "You can work at your own pace. You can do assignments when you have the time between other responsibilities." Similarly, Student A16 expressed, "I liked the fact that I could complete the work at my leisure and take time with assignments." The students also like the flexibility of being to access their classes any time of the day as noted by Student A1, "I could log in at a time convenient for me." Likewise, Student emphasized, "As a working student, it was much more convenient to 'go to class' during my own time. I was able to do a lot of the work in advance." Convenience also included being able to work on their courses from any location, especially their homes: "The factors

that make online classes best is that you can work on assignments on your own time and do it from the comfort of your home" (Student A34). Additionally, several students explained how online classes allowed them to continue with fulltime employment while taking classes. As Student A47 noted, "It [online courses] allowed me to hold a full-time job and continue my education. I still had to attend classes on-line, but they were [from the mainland U.S.], so my classes were not during work hours."

*Access to course information.* The students also stated the online courses were organized with information readily available in the online classroom. Eight coded responses supported this success factor. Student A13 explained, "Everything is mapped out for the semester ahead of time," and Student A61 emphasized, "Everything was posted online, so I was able to refer back to the information." Likewise, Student A35 noted, "I liked having access to the materials through the Internet." Students noted that online access to resources was quicker than having to get the information in a face-to-face class, as Student A72 explained, "Fully online classes usually provide materials like PowerPoint and handouts, which makes it more convenient to access rather than having to take notes in class."

*Group B (blended)*
Students who had taken blended courses echoed the sentiments as students from fully online courses.

*Convenience and flexibility.* Group B students also emphasized the convenience and flexibility blended courses afforded them with 21 coded responses generating this theme. As Student B19 expressed, "I do not have to go to class, I can do my work at home and learn at home while I can attend to my family's needs." Furthermore, eight coded responses indicated that students found face-to-face class hours beneficial in combination with the online hours in their blended courses. Student B5 explained, "We are still able to meet face-to-face with instructors, but we can be more flexible with our time while still learning the required material." Student B14 also emphasized how online hours and face-to-face hours could together maximize the learning: "The online discussions that can be incorporated into the classes allow for entirely conducive discussions when it is time for face-to-face instructions." Additionally, students liked how online hours could allowed instruction and learning to occur in the event an instructor had to miss a face-to-face session: "When my professor had to leave for a conference for a week, it [blended course] allowed us to stay on top of our assignments without sacrificing instruction time because we did it online."

*Research Question 2: What do SOE students at UOG find most difficult about taking online and blended courses?*
The survey items addressing research question two were open ended questions asking the students to list what they least liked about fully online and blended courses, which, in turn, made success in the courses difficult.

*Group A (fully online)*
The survey item generated 90 coded responses addressing research question two for students who had taken fully online courses. Four themes emerged from the coded responses: (a) instructor feedback and communication, (b) time management, (c) lack of peer interaction, and (d) technical

difficulties. Instructor feedback and communication was the factor most mentioned by the students with 38 coded responses, followed by time management with 21 coded responses. The students' responses generated 18 coded responses for lack of peer interaction, and 13 coded responses for technical difficulties.

*Instructor feedback and communication.* The students expressed that feedback from instructors took awhile, and that help from them was not readily available. Student A29 explained, "There is no immediate response from the instructor such as in a classroom when doing certain activities." Other students expressed that instructors may not reply to questions or concerns right away. Student A17 explained, "Questions can't be answered when we would like—meaning that we would have to wait for a response within 24 hours. Unlike in actual classrooms, we can get the answer to our questions right then and there." Because there were no face-to-face time with instructors, students stated it was difficult to communicate with instructors when they needed clarification and help with assignments. Student A21 expressed that online courses were difficult due to "the fact that it is sometimes hard to communicate thoroughly with an instructor if an explanation to a specific question is needed." Student A63 shared the same sentiments, "Student-teacher interaction is very limited. Sometimes lessons can get confusing, creating a hindrance and difficulty in understanding the given assignment or concept." However, Student A71 acknowledged, "Difficulty reaching the professor when in need of help may vary with professors."

*Time management.* Several students stated that time management was a challenge with online courses. They admitted that because classes were online, they tended to procrastinate or forget about deadlines, as Student A82 explained, "Because it's online, the likelihood of neglecting assignments is great. . . Sometimes you forget about the class—keeping up with deadlines—procrastinating." Student A20 added, "I don't think online classes are best for people who are very forgetful. The reason why I was not able to complete an online course was because I would miss important deadlines." Student A51 admitted, "My tendencies to procrastinate makes work pile up at the end."

*Lack of peer interaction.* With online courses, students expressed they missed the face-to-face interaction with classmates and believed this interaction was important. As Student A77 noted, "The absence of a physical class can leave students feeling lost." Student A29 acknowledged, "Feedback and interaction felt more comfortable in person." While students did like some components of online courses, they wanted peer interaction, as well, beyond the online classroom. Student A55 explained, "Some students, like myself, need the physical discussion and interaction."

*Technical difficulties.* Students expressed frustration with technical difficulties that would arise such as Internet disconnection and glitches with the online classroom platform. Student A89 stated, "There may be technical issues when it comes to doing and submitting work," and Student A10 reiterated this frustration, "Computer crashing or Internet disconnection acts as an obstacle, especially regarding deadlines." Because online courses are dependent on Internet connectivity and computer use, the students noted lack of computer literacy and knowledge of online tools were hindrances. Student A72 explained, "It was difficult to navigate through Moodle, and the teacher didn't fully understand how to use it [Moodle] either."

*Group B (blended)*

For students who had taken blended courses, the survey item generated 24 responses addressing research question two, with one theme emerging from the responses: instructor feedback and communication (10 coded responses). The remaining 14 responses were in differing areas with no emerging theme.

*Instructor feedback.* Students in this group participated in face-to-face and online class hours, and they noted that feedback from the instructor was slower and limited with the online portion of the course. Student B12 stated, "If I have a question, I can't get it as fast as I would in a face-to-face class." Student B3 reiterated, "Although communication via the Internet is very convenient, it is sometimes much slower than face-to-face communication when you have to wait for the response that you are expecting [in] a quick manner." Similarly, Student B11 shared, "What I least like about it is that I do not get help from the Professor as fast as when I am with my professor."

*Research Question 3: What would entice students to choose an online or blended course from UOG rather than one from a competing university?*

Each of the three groups of students (fully online, blended, and no online/blended) were asked to identify the factors that would encourage them to take fully online and/or blended courses from the University of Guam. The survey item provided a list of factors, and the students were instructed to select all that applied. Tables 4, 5, and 6 show the frequency and percent of the students' responses from each of the three groups (fully online, blended, and no online/blended, respectively).

**Table 4** (Fully Online Group) Frequency and Percent: Factors Encouraging Students to take Online Courses in UOG, N = 128

| Factor | | # of students | % |
|---|---|---|---|
| More hybrid and online class offerings | | 84 | **66%** |
| A course-specific "how to" or tutorial session | | 28 | 22% |
| Cost is less than other universities | | 57 | **45%** |
| A technology mentor | | 21 | 16% |
| More majors offered fully online | | 45 | 35% |
| Better advertising of online classes | | 24 | 19% |
| Better computer or Internet connection at home | | 27 | 21% |
| Greater confidence in my self-motivation | | 34 | 27% |
| Availability of face-to-face help if needed | | 57 | **45%** |
| A doctoral program in a field of interest | | 30 | 23% |
| Other | | 4 | 3% |

In Table 4, the fully online students identified the top factor that would encourage them to take online courses at UOG would be the availability of more hybrid and online class offerings with 66% of responses. The second highest rating was for two factors, which received 45% of student responses. These factors were cost (if less than other universities) and availability of face-to-face help if needed. The

least likely factor was having a technology mentor with only 16% of responses.  Students were also allowed to add "other" factors to the list.  These other responses included having at least one online class for every type of major, providing the basic course format prior to students signing up, offering Master Degree courses, and using digital course textbooks and materials.

**Table 5** (Blended Group) Frequency and Percent:  Factors Encouraging Students to take  Blended and Online Courses in UOG, N = 45

| Factor | | # of Students | % |
|---|---|---|---|
| More hybrid and online class offerings | | 28 | **62%** |
| A course-specific "how to" or tutorial session | | 11 | 24% |
| Cost is less than other universities | | 18 | **40%** |
| A technology mentor | | 8 | 18% |
| More majors offered fully online | | 11 | 24% |
| Better advertising of online classes | | 12 | 27% |
| Better computer or Internet connection at home | | 5 | 11% |
| Greater confidence in my self-motivation | | 8 | 18% |
| Availability of face-to-face help if needed | | 23 | **51%** |
| A doctoral program in a field of interest | | 12 | 27% |
| Other | | 1 | 2% |

In Table 5, the students in the blended course group identified the same top three factors as the online group that would encourage them to take additional blended or online courses at UOG.  These factors were the availability of more hybrid and online class offering (62%), availability of face-to-face help if needed (51%), and cost if less than other universities (40%).  The factors least encouraging students to take online or hybrid courses were better computer or Internet connection at home (11%), having a technology mentor (18%), and greater confidence in one's self-motivation (18%).  For other factors students could add to the list, one student simply said he/she did not want to take any hybrid classes.

In Table 6, the students who had not taken online and blended courses identified the same top three factors as the online and blended groups that would encourage them to take an online or hybrid course.  For this group, cheaper prices than other courses, was the top factor (70%), followed by the availability of more classes in the student's major (68%), and availability of face-to-face help if needed (66%).  The factors least encouraging students to take online or hybrid courses were better advertising (21%) and having a technology mentor (23%).  One student added a factor for other responses which was "the assurance that what I'm learning online would be equivalent to what I would be learning if I was to meet face to face."

**Table 6** (No Online/Blended Group) Frequency and Percent: Factors Encouraging Students to take Blended and Online Courses in UOG, N = 56

| Answer | | # of Students | % |
|---|---|---|---|
| Cheaper prices than other colleges | | 39 | **70%** |
| More classes available in my major | | 38 | **68%** |
| More confidence in my time management skills | | 29 | 52% |
| Availability of face-to-face help, if needed | | 37 | **66%** |
| "How to" seminar for online classes | | 21 | 38% |
| Wider variety of majors available online | | 16 | 29% |
| Better advertising about what is available | | 12 | 21% |
| A technology mentor | | 13 | 23% |
| Availability of a hybrid or online Ph.D. or Ed.D. | | 16 | 29% |
| Other | | 1 | 2% |
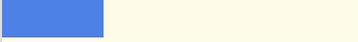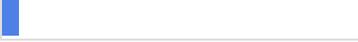
*Research Question 4: What courses or programs do SOE students at UOG most want to be offered online?*

All three groups of students (fully online, blended, and no online/blended) were asked this question on the survey. The survey question was an open ended item in which students stated the courses or programs they wanted. Seventy-eight out of the overall 236 survey participants responded to this survey question. The responses from all three groups were combined, and Table 7 shows a breakdown of the top five types of courses or programs identified by 64 out of the 78 students.

Table 7: *Courses or Programs SOE Students want to be Offered Online, N = 64*

| Course or Program | # of Students |
|---|---|
| 1. Specific General Education courses (English = 5, History = 4, Guam History = 3, Math = 3, Science = 3, Health =1 , and Music = 1) | 20 |
| 2. Education courses (undergraduate and graduate) | 19 |
| 3. General Education courses overall | 11 |
| 4. Doctoral program | 9 |
| 5. Graduate courses in general | 6 |

In Table 7, General Education (GE) courses (items 1 and 3) had the highest number of responses with 39 students indicating they wanted these courses offered online. Item 1 shows a breakdown of the specify type of GE online courses the students want, with English and History/Guam History topping the list (five and seven students, respectively). For item 3, the students stated they wanted online GE courses but did not specify the type of GE courses. Nineteen students indicated they would like to see more education courses (undergraduate and graduate) offered online. For this item, several students indicated they wanted online courses for those education courses that are currently offered only during spring and fall semesters so they can take these education courses during any semester, summer, and intercession.

Finally, six students indicated they wanted more graduate courses offered online, while nine students stated they were interested in a doctoral program offered online.

*Research Question 5: Would SOE students at UOG enroll in an online or blended doctoral program should the program become available?*

All three groups of students (fully online, blended, and no online/blended) were asked this if they would enroll in an online or blended doctoral program offered by SOE that was a fully accredited Ed.D. or Ph.D. program. The students responded based on the following choices: (a) yes; (b) most likely; (c) possibly, but don't know; or (d) no.

*Online doctoral program*

Tables 8a-c, provide a breakdown of each group's responses for an online doctoral program.

**Table 8a** Group A (Fully Online Students) – Frequency and Percent of Students who would Enroll in an Online Doctoral Program, N = 129
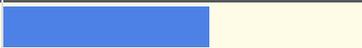
| Answer | | # of Students | % |
|---|---|---|---|
| Yes | | 56 | 43% |
| Most likely | | 26 | 20% |
| Possibly, but don't know | | 35 | 27% |
| No | | 12 | 9% |
| Total | | 129 | 100% |

**Table 8b** Group B (Blended Students) – Frequency and Percent of Students who would Enroll in an Online Doctoral Program, N = 44

| Answer | | # of Students | % |
|---|---|---|---|
| Yes | | 20 | 45% |
| Most likely | | 8 | 18% |
| Possibly, but don't know | | 12 | 27% |
| No | | 4 | 9% |
| Total | | 44 | 100% |

**Table 8c** Group C (Non Online/Blended Students) – Frequency and Percent of Students who would Enroll in an Online Doctoral Program, N = 57
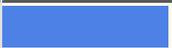
| Answer | | # of Students | % |
|---|---|---|---|
| Yes | | 20 | 35% |
| Most likely | | 9 | 16% |
| Possibly, but don't know | | 26 | 46% |
| No | | 2 | 4% |
| Total | | 57 | 100% |

Tables 8a-c show that for all three groups of students (fully online, blended, and non-online/blended), more than half of the students indicated "yes" or "most likely" they would enroll in an online doctoral program, with 63% of fully online and blended students, and 51% of the non-online/blended students indicating these affirmative responses.  Only a small percent responded "no"—9% for the fully online and blended students, and 4% for the non-online/blended students.

*Blended doctoral program*
Next, tables 9a-c, provide a breakdown of each group's responses for a blended doctoral program.

**Table 9a** Group A (Fully Online Students) – Frequency and Percent of Students who would Enroll in a Blended Doctoral Program, N = 127

| Answer | | # of Students | % |
|---|---|---|---|
| Yes | | 66 | 52% |
| Most likely | | 31 | 24% |
| Possibly, but not sure | | 22 | 17% |
| No | | 8 | 6% |
| Total | | 127 | 100% |

**Table 9b** Group B (Blended Students) – Frequency and Percent of Students who would Enroll in a Blended Doctoral Program, N = 45

| Answer | | # of Students | % |
|---|---|---|---|
| Yes | | 24 | 53% |
| Most likely | | 11 | 24% |
| Possibly, but don't know | | 6 | 13% |
| No | | 4 | 9% |
| Total | | 45 | 100% |

**Table 9c** Group C (Non Online/Blended Students) – Frequency and Percent of Students who would Enroll in a Blended Doctoral Program, N = 57

| Answer | | # of Students | % |
|---|---|---|---|
| Yes | | 19 | 33% |
| Most likely | | 13 | 23% |
| Possibly, but don't know | | 23 | 40% |
| No | | 2 | 4% |
| Total | | 57 | 100% |

Tables 9a-c show that for all three groups of students (fully online, blended, and non-online/blended), more than half of the students indicated "yes" or "most likely" they would enroll in a blended doctoral program, with 76% of fully online students, 77% of blended students, and 56% of the

non-online/blended students indicating these affirmative responses.  Only a small percent responded "no"—6% of the fully online students, 9% of blended students, and 4% of the non-online/blended students.

**Table 10** Comparison of the results from Tables 8a-c (enrolling in an online doctoral program) with Tables 9a-c (enrolling in a blended online doctoral program).

| Answer | GROUP A | | GROUP B | | GROUP C | |
|---|---|---|---|---|---|---|
| | Online % | Blended % | Online % | Blended % | Online % | Blended % |
| **Yes** | **43%** | **52%** | **45%** | **53%** | **35%** | **33%** |
| **Most likely** | **20%** | **24%** | **18%** | **24%** | **16%** | **23%** |
| Possibly, but don't know | 27% | 17% | 27% | 13% | 46% | 40% |
| No | 9% | 6% | 9% | 9% | 4% | 4% |
| Total | 100% | 100% | 100% | 100% | 100% | 100% |

The findings in Table 10 show that a higher percent of students from all three groups would enroll in a blended doctoral program versus an online program as shown by their affirmative responses "yes" and "most likely."  For Group A, 76% of the students said "yes" or "most likely" they would enroll in a blended doctoral program versus 63% in an online one.  For Group B, 77% of the students gave these affirmative responses for a blended doctoral program versus 63% for an online program.  For Group C, a slightly higher percentage of students (56%) indicated they would enroll in a blended doctoral program versus 51% in an online program.

**Conclusions and Recommendations**

This study explored the learning experiences of University of Guam students with online and blended programs.  The findings of the study reveal what students believe worked well to help them to complete online courses, what they find makes success difficult, and what direction they would like to see these types of programs take for their future educational endeavors.  The results of this study were drawn from a sample of 236 UOG SOE students responding to a survey about their learning experiences with online and blended courses.  Additionally, perceptions from students who have not experienced either type of program were also included.

Regarding what students believe is going well and the factors that have helped them succeed in online and blended programs, the students overwhelmingly identified the convenience and flexibility that online and blended programs afforded them.  Students liked being able to do their online coursework during any time of the day and from any location (specifically, the convenience of being able to work at home).  Such convenience and flexibility allowed the students to maintain fulltime jobs and do their online coursework around their work schedules and personal responsibilities.  As such, the students were able to maintain the needed balance between competing responsibilities to help them succeed in their studies.  Additionally, the students noted that course information and resources were readily available and easily accessible with online courses.  Thus, high quality academic content and course delivery were also critical to their success in these courses.

For students who had taken blended courses, they believed they had the "best of both worlds" with a combination of online and face-to-face class hours.  In addition to the benefits they enjoyed with the online portion of their courses, the face-to-face interaction with their instructors and classmates were beneficial for those students who wanted this type of learning experience as well.  These students felt both types of formats maximized their learning experience.  For students who want face-to-face peer interaction, blended courses afforded them the benefits of online learning and real time interaction with instructors and classmates.

The factors students believed were difficult about their online courses included lack of or late feedback from instructors, time management, technical difficulties, and lack of peer interaction (for those students who had only taken fully online courses).  To improve their online learning experience, the students want timely and frequent communication with their instructors in comparison to face-to-face classes in which students receive immediate feedback and clarification from instructors.  Because the students were able to do their assigned work at any time of day they recognized that procrastination was a great temptation and the necessity of excellent time management skills.  Minimizing technical difficulties is also critical to the students' learning experience, as online courses are dependent on reliable Internet access, e-learning platforms, and online learning management systems.  Regarding students' concerns with lack of peer interaction in their online courses, technology innovations can be integrated in the online classroom to provide such real time interaction via a variety of media resources.

Factors that would entice students to choose an online or blended course from UOG versus other universities included lower cost, more courses in their areas of interest, and the availability of face-to-face help as needed.  In response to the academic trend for online courses and online degree programs, the University would benefit from finding ways to expand its online offerings and programs without markedly increasing the current costs for such an education.  Notably, the students expressed a desire for more teacher education and general education courses offered in an online and blended format.  Additionally, the very strong interest by all the groups in this study for UOG to offer an online or blended doctoral program is worthy of particular note.

Students' responses in this study support the national technology trend that demands UOG offer online programs in order to remain competitive.  Only a small percent of students in the study stated they would not enroll in an online or blended course, as they acknowledged that online learning was not for them.  However, the students' voices at large in this study support the growing trend for increased online learning experiences whether through fully online or blended courses.  With the improved ease of accessing online information, the wide variety of technology and media resources, and a technology savvy college generation, the demand for increased and quality online learning experiences will continue to grow.

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# Digital Literacy: How Can the Flipped Classroom Help?

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**Abstract**

This study looks into the flipped classroom across borders in three various ESL/EFL tertiary-level contexts.  As a way to address students' needs for 21st century education, the flipped classroom was the pedagogical approach chosen for helping L2 English learners to meet their learning outcomes in credit-bearing language courses in the United States and Macau and non-credit-bearing courses in Colombia. This study implemented an experimental design with a mixed methods approach for data collection. Data was collected from a technology survey, focus group sessions, and reflective essays. Before each class, students in the experimental groups in all three countries previewed lessons through online videos and screencasts in order to better prepare for classroom activities, while students in the control groups did not preview materials.  For the experimental groups, the time spent on students' learning information at home greatly freed up time in class for them to evaluate and synthesize the materials they were expected to know and use.  Results showed that students in the experimental group felt that the flipped classroom approach helped not only to promote their digital literacies, but that it also helped them to master the classroom content.

*Keywords*: flipped classroom, learner attitudes, technology, EFL

**Introduction**

As digital natives, learners today have come to expect technology to be integrated into their studies. A 2015 study by UK communications found that young people between the ages of 16-24 spend more than 27 hours a week on the Internet, which is almost tripled when compared to the 10 hours and 24 minutes each week recorded in 2005 (Anderson, 2015).  In order to help address students' needs in the 21st century, teachers have to come up with innovative ways in which technology can be used in the classroom, especially at the tertiary level where classroom time is limited. Dede (2008) has argued that educators have to integrate various technologies into the classroom, in addition to a regular learning management system (LMS), as multiple tools best help to achieve learning.  Siemens and Matheos (2010) have suggested that learners need to have more access to learning content online to address the way in which learners today consume information.

Applying the flipped method to teaching and learning is one of the best ways to ensure that technology is a key component to learning.  "Flipping the Classroom" is a modern pedagogical paradigm

of teaching and learning that is traditionally defined as one in which all homework is done in class, and all classwork is done at home. Although the term was coined by Baker in 2000, it has only been in more recent years that it has generated a greater amount of interest. A typical flipped classroom approach involves students watching online video lectures prior to in-class meetings as a way to better prepare for more engaging and interactive lessons. The assumptions behind this model is that if students are better prepared, they will be able to participate more in discussions, debates, and problem-solving activities, all of which should lead to a more student-centered classroom which promotes the higher-order thinking skills, those which form the peak of the triangle in Bloom's Taxonomy (1956), i.e., evaluation, synthesis, analysis, and application. During the in-class face-to-face sessions, teachers can also monitor student performance and give individual instruction or feedback more often.

Constructs for the flipped classroom are grounded in behaviorism as it promotes habits and behaviors in students, individualized learning and repetition of key concepts, and a system of rewards through formative assessments, in constructivism as it allows for more student-to-student as well as teacher-student interaction and a co-construction of meaning, and in sociocultural theory as it establishes a greater degree of interaction that engages the Zone of Proximal Development (ZPD) (the difference between what a learner can do without help and what he or she can do with help). The flipped classroom can also be seen as a modern extension of Communicative Language Teaching (CLT) in that the online videos reduce the amount of teacher-fronted instruction and turn the classroom into an environment where active learning approaches dominate.

Although flipping the classroom has rapidly become popular in the American K-12 education system, it has been less commonly undertaken in tertiary-level classrooms, particularly in contexts outside of the United States. By flipping an English as a Foreign Language classroom in Macau and Colombia and an English as a Second Language class in the United States, data from a technology survey, focus group sessions, and reflective essays were collected over one semester which led to this study, creating a perfect opportunity to address the lack of research on classroom flipping at the university level and across borders. By instructors integrating technology and promoting independent learning into their classrooms, university students are able to become autonomous learners with the assistance of the instructor who serves as a moderator and facilitator, rather than a lecturer. In additional, the flipped model better suited the needs of 21$^{st}$ century students, allowing teachers to address the 4Cs of learning: critical thinking, creative thinking, communicating, and collaborating.

Students can use critical thinking and problem-solving as they tackle the group projects and presentations assigned to them in the flipped classroom. They can critically evaluate, analyze, and synthesize new information. Students can communicate and collaborate during the pair and group work that they undertake in class. Each person in the group can take a role, so that everyone has their own individualized part to play in the team efforts. Students can be creative and innovative with using technology through the new software and websites that the teacher introduces for coursework and independent learning activities, assigned both in and out of the classroom. Not only computers, but also tablets, Smartboards, and Smartphones are capable these days of providing technological resources in the learning process. Students can even use the computer, though websites and learning management systems, to complete homework assignments by further investigating issues by themselves, encouraging

autonomy and generating students' responsibility for their own learning – a skill that they will need after graduation from university as they move into their careers. It is reported that Millenials are expected to have 15-20 jobs in their lifetimes (Meister, 2012). It is, therefore, imperative for them to have transferable skills that will allow them to move freely between positions and to be able to think on their feet, both critically and creatively.

Bishop and Verleger (2013) show that there are very few studies employing experimental designs that compare flipped versus non-flipped students; rather, most focus on student and teacher perceptions of the flipped classroom alone. And few to no studies exist which empirically show the improved digital literacies and mastery of content due to exposure to the flipped method. Therefore, it is hoped that the current study will help to fill the gap in the literature on the flipped classroom and offer data in support of the flipped model. By doing so, the following research questions are addressed in the current study:

RQ1: Do students in flipped classes experience a change in attitudes towards the use of technology for language learning over time?

RQ2: Do students in a flipped class differ from students in traditional classes in their attitudes toward the use of technology for language learning?

RQ3: Does cultural context of instruction have an effect on students' attitudes toward the use of technology for language learning?

RQ4: What do students in flipped classes think about the use of technology for language learning? Do they share common attitudes and perceptions? If so, what are they?

**Review of the Literature**

Despite the call for student-centered classrooms, we have to admit that most traditional classrooms are still greatly teacher-centered. The teacher serves as the 'sage on the stage' transmitting to students their knowledge, usually by lectures and PowerPoint presentations. Students, on the other hand, traditionally, are passive observers in this process, taking careful notes of what the teacher says. When we think of homework, also, we imagine students working in seclusion on problems, completing written assignments and doing worksheets based on reading assignments. The process is lonely and allows for little cooperation and immediate feedback, needless to say.

However, the flipped classroom changes all of this. While addressing the demand for students to still have some lecture content in their classes, flipping allows for lectures to be pre-recorded so that students can watch them in their own free time, without taking away from classroom time. Students can then rewind, fast-forward, or watch certain segments of the video as often as they like, until they feel like they fully grasp the material. They can take breaks as needed, so that they can be refreshed when listening again. Unlike the traditional lecture, students in the flipped classroom can reflect on the material as they need, stop the recording to take detailed notes, and even make lists of concepts they still do not understand while listening to a pre-recorded lecture. They can ask questions online or come prepared with questions to ask during the review session at the beginning of the next face-to-face class.

Videos are just one component of the flipped classroom. Recent affordances and choices of technology have created many more options of technology that can be integrated into the flipped classroom. While the researchers of this study have investigated the literature that exists on the flipped classroom from several angles (see Doman & Webb, 2014, 2015), the current literature review will focus on how the flipped methodology addresses students' computer literacy skills and attainment of content.

As can be expected, students in a flipped classroom are required to develop and use digital literacy skills in order to manipulate the course content, submit work, post comments on forum discussion boards, view and create videos, take quizzes, and to work collaboratively on group projects. Rowe, Frantz, and Bozalek (2013) found that students in their medical classes perceived themselves as being better trained and prepared with the use of technology than their counterparts who had not been involved in a flipped classroom. Also, the front-loading of activities in the flipped approach contributed to student achievement. A learning management system such as Moodle or Blackboard was a great place for students to navigate through the course content. Linking videos to quizzes allowed for more formative assessment (Davies, Dean, & Ball, 2013; Murphree, 2014). Quizlet (Talley & Scherer, 2013) and Socrative (Doman & Webb, 2014, 2015) were instrumental in providing real-time formative feedback to ensure that students understood the content in flipped classrooms. Providing quizzes in conjunction with the outside-the-classroom videos that students were expected to watch also boosted student motivation to complete the homework (Strayer, 2012; Talley & Scherer, 2013).

Students in several studies also reported that the flipped classroom helped them to master content in the course. Willey & Gardner (2013) found that students saw the outside-the- classroom online activities as ways to point out what the students did or did not understand, especially through online quizzes. One student remarked that it was "a great way to test my understanding without losing marks" (Willey & Gardner, 2013, p. 6). Students found that the flipped classroom was a way in which they could engage in informed learning which included using information creatively and reflecting on what was learned. By drawing on different ways in which information was used, Bruce, Hughes & Somerville (2012) remarked that students were able to grasp difficult concepts by making learners more aware of information by addressing their abilities to navigate the information. By more actively engaging with information, the content became more meaningful, and learners could deepen their informational literacy skills as well as learn course content (Lemmer, 2013).

Students also reported that the flipped approach allowed for more class time to be allocated to activities which addressed the higher levels of Bloom's Taxonomy more regularly (Lemmer, 2013). This was also echoed by Doman, Webb, & Pusey (2015) and Doman & Webb (2014, 2015) in their studies of Macau students' exposure to the flipped classroom. Their empirical studies found that students believed that the flipped classroom allowed them more time in class to fully evaluate and synthesize the information that was necessary for the class assessments.

In addition, Morin, Kecskemety, Harper, & Clingan (2013) tested 13 sections of an engineering course each containing 36 students and found that students found the delivery of content in the flipped approach to better suit their learning needs. By making content more easily assessable, students felt they

could move through the materials at their own paces and review the content as much as possible until they finally understood it sufficiently (Morin, Kecskemety, Harper, & Clingan, 2013).

Many studies have shown that students in flipped classrooms report that they have achieved more than in traditional classrooms (Davies, Dean, & Ball, 2013; Mason, Shuman, & Cook, 2013; McLaughlin, Griffin, Esserman, Davidson, Glatt, Roth, Gharkholonarehe, & Mumper, 2013; Murphree, 2014; Strayer, 2012; Wilson, 2013). Davies, Dean, & Ball (2013) reported that students in their flipped undergraduate classes finished 5 points higher on the final exam than students in the traditional classroom. Mason, Shuman, & Cook (2013) and Strayer (2012) found that the flipped environment helped students to perform statistically ($p = .001$) better. McLaughlin et al. (2013) found a measurable significance in student achievement through a mixed-methods study they undertook, while Murphree (2014) described a 5.6 point increase on the final exam of students in the flipped class. This increase was also shown in Wilson's (2013) study where students in the flipped class performed 6.73 points higher than those in the traditional non-flipped class.

While the studies investigated for this review of the literature did show that the flipped classroom led to digital literacy and the attainment of content, few of the studies provided convincing empirical evidence that was triangulated through a variety of sources. In fact, most of these relied on surveys as the main instrument of data collection. The current study hopes to move one step further in providing evidence either for or against the flipped approach through not only surveys, but also a thorough examination of data from focus group sessions and reflective essays.

**Methodology**

*Background of Study*

The current study is part of a larger three-year study that first began at a university in Macau and then spread to Colombia and the United States as two of the researchers took on new positions. The original project was born out of the need to supplement the limited number of contact hours with the students with more substantial outside-the-classroom activities in order to promote English language learning. Even as the contexts changes, the goal remained the same: to create better learning environments in which students were more actively engaged with the materials and better prepared to take charge of their own learning.

As seen in Table 1 below, the methods of data collection for the flipped classroom project have changed over time. The first studies in year 1 focused on student and teacher satisfaction with the flipped model, while those of the second year – which are documented in the current study – focus on student perceptions of technology. Finally, investigations into the ability (or not) of the flipped model to lead to gains in students' knowledge of English grammar were undertaken in year 3 of the study.

The current study employs a mixed methods approach in order to capitalize on the benefits of quantitative and qualitative methods. It employs an experimental design in using the flipped approach for the experimental groups and traditional teaching and learning styles for the control, i.e., non-flipped classes.

**Table 1** Background of the long-term study

| Year 1 | Year 2 | Year 3 |
|---|---|---|
| 4 teachers, Macau | 3 teachers, Macau, USA & Colombia | 2 teachers, Macau & USA |
| observations, satisfaction survey, teacher reflections | technology surveys, focus group sessions, student reflective essays | grammar instruction, grammar survey, Pre-and Post-test, technology surveys, focus groups |
| mixed methods approach | mixed methods approach | mixed methods approach |
| 3 experimental.; 2 control | 3 experimental; 4 control | 2 experimental; 2 control |

*Participants and Context*

Three ESL/EFL instructors in three different contexts participated in this study. 128 students across 5 sections of courses participated in at least one aspect of this study – the survey, while smaller groups participated in the focus groups and submitted reflective essays. As seen in the graph in Appendix 4, Macau had the greatest number of participants (N=55), with Colombia having the second most (N=50) and the US with the smallest group (N=23). Macau and Colombia both had an experimental and control group, whereas the US group was composed of only an experimental group. All 128 are identified in this study with pseudonyms. Student are first identified by their country and then later with a number, such as Macau – SS1, Macau – SS2, Colombia – SS 1, USA – SS 1, and so on.

Among the 50 participants from Colombia, 20 formed the experimental ("flipped") group, while 30 were in the control ("traditional") group. Macau had the highest proportion of participants, with a total of 55 subjects coming from this context (19 in the experimental group and 36 in the control group). From the US context, there were a total of 23 participants, all of which were in the experimental condition. (Thus, there was no control group for USA.)

As seen in Table 2, participants in the Macau group were all ethnic Chinese between the ages of 18-20 years old. They were all first-year university students enrolled in an intermediate EAP course. The type of class which the Colombian group participated in was similar to that of Macau, but participants ranged from first year to fourth year students, and all were Colombian nationals. Meanwhile, the US group was the most diverse, with students ranging from 17-55 years old from various nationalities. Also, the class the US participants were enrolled in was slightly different, as the focus was on listening and speaking and not integrated EAP skills.

**Table 2** Composition of three groups of participants

|  | **Program Type** | **Class type** | **Ages** | **Nationalities** |
|---|---|---|---|---|
| USA | 2 year community college | Intermediate Listening and Speaking | 17-55 years old | 1 Korean<br>1 French<br>1 Afghani<br>3 Mexican (13%)<br>5 Japanese (22%)<br>12 Chinese (52%) |
| Macau | Public university, 1st-year undergraduates | Intermediate, integrated skills, EAP | 18-20 years old | 70% Macau locals, 30% Mainland Chinese |
| Colombia | Private university, 1st - 4th year undergraduates | Intermediate, integrated skills, EAP intensive Course | 17-21 | 100% Colombian |

*Data Collection*

Three types of data were collected from participants for this study: quantitative data from technology surveys and quantitative and qualitative data from focus groups and reflective essays. A smaller group of participants from each experimental group in each region participated in focus group discussions, while all participants in the experimental groups submitted reflective essays, and all participants (control and experimental) filled out surveys related to technology. Table 3 shows that the data from the focus group sessions and reflective essays were analyzed similarly, in that they were all coded blindly and tallied according to the most common themes. The results of the surveys were analyzed with SPSS T-tests and tests of ANOVA.

*Technology Surveys*

A common survey composed of 16 items was given to all control and experimental groups. A pre-test survey was given in the first week of classes prior to instruction, while the post-test survey was given in the final weeks of classes after instruction. Four constructs were measured on the surveys:

INS = instrumentality
ANX = anxiety
COM = comfort
DIG = digital literacy

**Table 3** Procedures for analyzing data

| Focus Groups | Reflective Essays | Technology Surveys |
| --- | --- | --- |
| Blind coding individually | Blind coding individually | Cronbach Alpha to determine reliability of questions |
| Determine common codes | Determine common codes | SPSS Descriptive Statistics for means and SD |
| Re-code according to most common points | Re-code according to most common points | SPSS T-test to measure significance of differences |
| Tally of most common points | Tally of most common points | ANOVA to find which variables led to change |

The survey questions were based on a 5-point Likert scale. All questions were coded from 1-5, with 1 being "Strongly Agree" and 5 being "Strongly Disagree".  Thus, for Instrumentality, Comfort, and Digital Literacy, average ratings closer to 1 (strongly agree) indicated favorable attitudes toward the use of technology for language learning.  Anxiety was reverse-coded here for the sake of consistency.  For example, let's look at the statement, "I feel nervous when I have to use computer programs like Microsoft Word, Google Documents, Power point, etc."  A student who said "Strongly Disagree" for this question (anxiety) was given a score of 1, thus showing that they did not have anxiety using technology.

The reliability of the technology survey was measured by finding Cronbach Alpha scores for the constructs.  Appendix 5 shows reliability statistics for the survey that was used in the study, as well reliability estimates for each subsection of the survey as they pertained to the four constructs that they were intended to measure (instrumentality, anxiety, comfort, and digital literacy). Cronbach's alpha for the suite of survey questions was found to be $\alpha = .873$, indicating acceptable reliability overall. Further tests of reliability for the subscales corresponding to the four constructs measured in the survey yielded higher values than the alpha obtained overall, with alpha levels for anxiety and digital literacy falling within the "acceptable" range ($\alpha = .826$ and $\alpha = .795$, respectively); however, the alpha obtained for both instrumentality and comfort was within the "poor" range (at $\alpha = .617$ and $\alpha = .688$, respectively). The correlation between the four subscales of the survey was also measured.  Significant correlations between all subscales were measured using Spearman's Rho, as seen in Appendix 6.

*Focus Groups*
In addition to student responses on the technology survey, focus group sessions with volunteer participants from the experimental groups were held to gain a deeper understanding of students' attitudes towards technology.  Data was collected from seven students in each experimental group across all three borders, for a total of 21 participants in three countries who volunteered to participate in outside-the-classroom focus group sessions.  These sessions were group oral interviews with the researcher or a

delegate lasting 30-45 minutes.  The sessions were then transcribed and coded. There were ten questions asked during the focus group, with students responded to the questions that they wanted to, followed up by additional feedback from the other members of the focus group.  The questions from the focus groups are attached in Appendix 2 of this study.  All of the questions were created by the researchers of this study.

*Reflective Essays*

Students in the experimental groups wrote reflective essays at the end of the semester.  While the essays were guided with questions, students could feel free to write as much or as little as they wanted in response to the questions.  Reflective essays from 20 participants in the US, 19 in Macau, and 20 in Colombia serve as the data for this section.

Each of the researchers chose to use a different set of prompts for their individual reflective essays, capturing all elements of what was learned in class rather than focusing exclusively on the flipped content. An example of the prompts given by the researcher in Macau shows the assignment was extremely comprehensive, but only two subsections of the prompts focused on the use of technology, or more specifically, the flipped classroom.  It was only these two sets of prompts which were examined for purposes of this study in the case of Macau. The questions asked about technology and the flipped approach were 90% similar to those used in the US and Colombia, only differing by one additional question each.  Regarding technology, students were asked to comment on the different platforms, websites, or applications that they used throughout the semester.  Specific questions about the flipped classroom included:

- How satisfied are you with the flipped approach to teaching and learning?  Is this style of teaching very different from the style of teaching in your other classes?  How?
- What did you like most about the flipped approach?  Give specific examples of activities that you liked.
- Did the flipped approach help you to learn the materials?
- Would you like more flipped classes?
- How could I make your flipped classes better?  Please give concrete examples of what you would like to do?

The essays were later read and coded by the researchers.  Common themes were first identified and agreed upon by all three researchers.  Then, the number of appearances for each theme was counted, and a list of examples for each theme was compiled from each context (US, Macau and Colombia) of papers.  The number of appearances were then evaluated quantitatively to see which ones were more prominent among the total number of responses, and then qualitatively to support the findings from the technology surveys.

**Results**

*Technology Surveys in each Context*

The results of the technology surveys were analyzed with SPSS, version 18.  The pre-tests and post-tests were compared to see if there were significant changes in students' attitudes towards

technology over time. As seen in a graph in Figure 1 below learners in all three contexts reported similar feelings regarding each construct.

**Figure 1** Post-test experimental attitudinal ranges across contexts
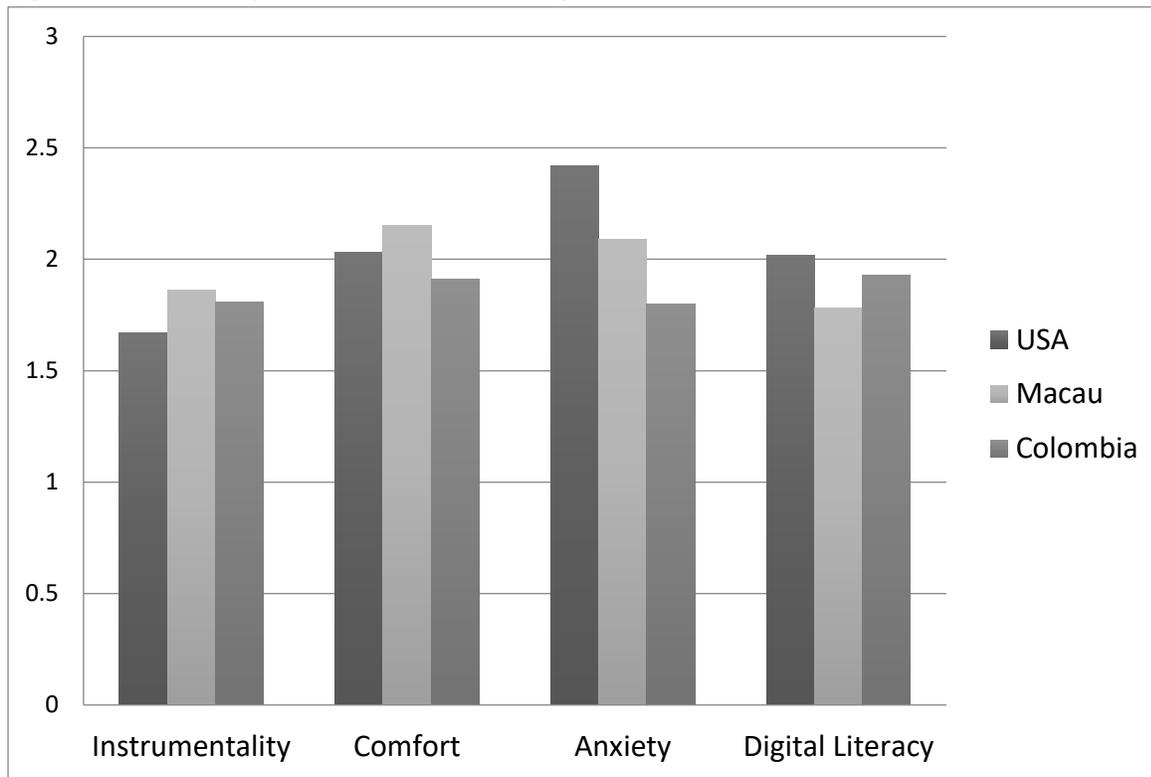


Tables in Appendixes 7-9 show the Wilcoxin Signed Ranks Test was performed on the experimental (i.e., flipped) group in for each cultural context (i.e., Colombia, Macau, and USA). This repeated-measures test was used because the data was not normally distributed and was measured on an ordinal scale, thus fitting the assumptions for using this test (Hatch & Lazaraton, 19901). As can be seen in Appendix 7, the USA group showed a statistically significant difference in attitudes across the four constructs from pre- to post-test time (i.e., from the beginning to the end of the course). Results of the Wilcoxin test were not found to be statistically significant for either Colombia in Appendix 8 or Macau in Appendix 9.

*Technology Surveys among Groups*

The survey results of the flipped and non-flipped groups in each context were also compared. Research question 2 investigated whether students in a flipped course differ from students in traditional classes in their attitudes toward using technology in the classroom. To answer this question, the Mann-Whitney U statistical procedure was selected. Because the level of measurement was ordinal, and because the data was not normally distributed, this test was deemed appropriate for this analysis. Pre- and posttest analyses were performed in order to reveal any preexisting differences between the two groups before the interventions. Appendix 10 shows the pre- test results. As can be seen in Appendix 10 there was a statistically significant difference between the two groups in terms of attitudes towards

instrumentality at pre-test time. There were no significant differences between the groups for the other three constructs (comfort, digital literacy, and anxiety). The results of Table 4 below further revealed that at post-test time, there were statistically significant differences in attitudes for all constructs except comfort. (Difference in ratings for instrumentality slightly increased in significance as well from $p$ =.002 to $p$ =.001.)

**Table 4** Post-test difference in attitudinal ratings between flipped and non-flipped groups

| Construct | Mean rank | | z | p-value(2-tailed) |
| --- | --- | --- | --- | --- |
| | Flipped | Non-flipped | | |
| Instrumentality | 53.31 | 75.02 | -3.344 | .001* |
| Comfort | 61.36 | 67.45 | -.942 | .346 |
| Digital literacy | 53.68 | 74.67 | -3.241 | .001* |
| Anxiety | 55.73 | 72.73 | -2.607 | .009* |
| *Note. Mann-Whitney U, z=1.96; *p <.05; Flipped n=62; Non-flipped n=66.* | | | | |

*Effect of Cultural Context*

The three contexts were also compared in order to answer RQ3 ('are students' attitudes toward using technology in the classroom different among the three cultural contexts?'), the Kruskal-Wallis statistically procedure was selected to analyze pre- and post-test results. Kruskal-Wallis was chosen because, as before, the data was ordinal level and was not normally distributed. Results of the pre-test in Appendix 11, as shown in the table, indicated statistically significant differences in attitudes among the three cultural contexts (Colombia, Macau, and USA) on all the constructs except for instrumentality. Further analysis of the pair-wise (post-hoc) comparisons, performed using the Mann-Whitney U test in Appendix 12, revealed that most of the variation observed in the Kruskal-Wallis results derived from the differences between Colombia and USA, in which significantly different ratings of comfort, digital literacy, and anxiety were observed. Colombia and Macau were most similar at pre-test time, only differing significantly in ratings of comfort.

At post-test time as demonstrated in Table 5, attitudes were much more uniform across contexts, only reaching significance in anxiety ratings as indicated by the Kruskal-Wallis post-test analysis. Further analysis of the pair-wise comparisons in Table 6 (via Mann-Whitney U) shows that this difference comes from the comparison of Colombia and USA, where anxiety ratings remained statistically significant.

*Focus Groups and Student Reflections*

Data from the surveys were triangulated with data from focus group sessions and student reflective essays. The data from the focus groups and student reflections was analyzed both quantitatively and qualitatively. First, the transcripts from the recorded focus group sessions and the written reflections were coded to reveal four common themes as seen in Figure 2 below: the mastery of content by using a flipped approach, the instrumentality of technology through the flipped approach, student satisfaction with flipping, and student desire for more flipped content.

**Table 5** Post-test Comparison of Mean Attitudinal Ratings Among Flipped Students Across Contexts

| Construct | Context | Mean Rank | Chi-Square | p-value |
|---|---|---|---|---|
| Instrumentality | Colombia | 26.80 | 2.570 | 0.277 |
| | Macau | 34.53 | | |
| | USA | 34.03 | | |
| Comfort | Colombia | 30.67 | 1.246 | 0.536 |
| | Macau | 35.13 | | |
| | USA | 29.00 | | |
| Digital Literacy | Colombia | 33.04 | 1.055 | 0.590 |
| | Macau | 28.00 | | |
| | USA | 33.05 | | |
| Anxiety | Colombia | 37.93 | 6.376 | 0.041* |
| | Macau | 31.47 | | |
| | USA | 24.13 | | |

*Note. Kruskal-Wallis Test, *p<.05, Colombia n=20; Macau n=19; USA n=23.*

**Table 6** Pair-wise Comparisons of Mean Attitudinal Ratings Among Flipped Students Across Contexts at Pre-test Time

| Groups Compared | Construct | z | p-value (2-tailed) |
|---|---|---|---|
| Colombia X Macau | Instrumentality | -0.10 | .920 |
| | Comfort | -1.13 | .260 |
| | Digital Literacy | -0.93 | .354 |
| | Anxiety | -1.39 | .164 |
| Colombia X USA | Instrumentality | -1.34 | .180 |
| | Comfort | -0.26 | .794 |
| | Digital Literacy | -0.04 | .970 |
| | Anxiety | -2.42 | .016* |
| Macau X USA | Instrumentality | -1.39 | .164 |
| | Comfort | -0.76 | .448 |
| | Digital Literacy | -0.87 | .385 |
| | Anxiety | -1.26 | .206 |

*Note: Mann-Whitney U, z=1.96; *p <.05; Colombia n=20; Macau n=19; USA n=23.*

**Figure 2** Common theme totals from focus group and student reflection data
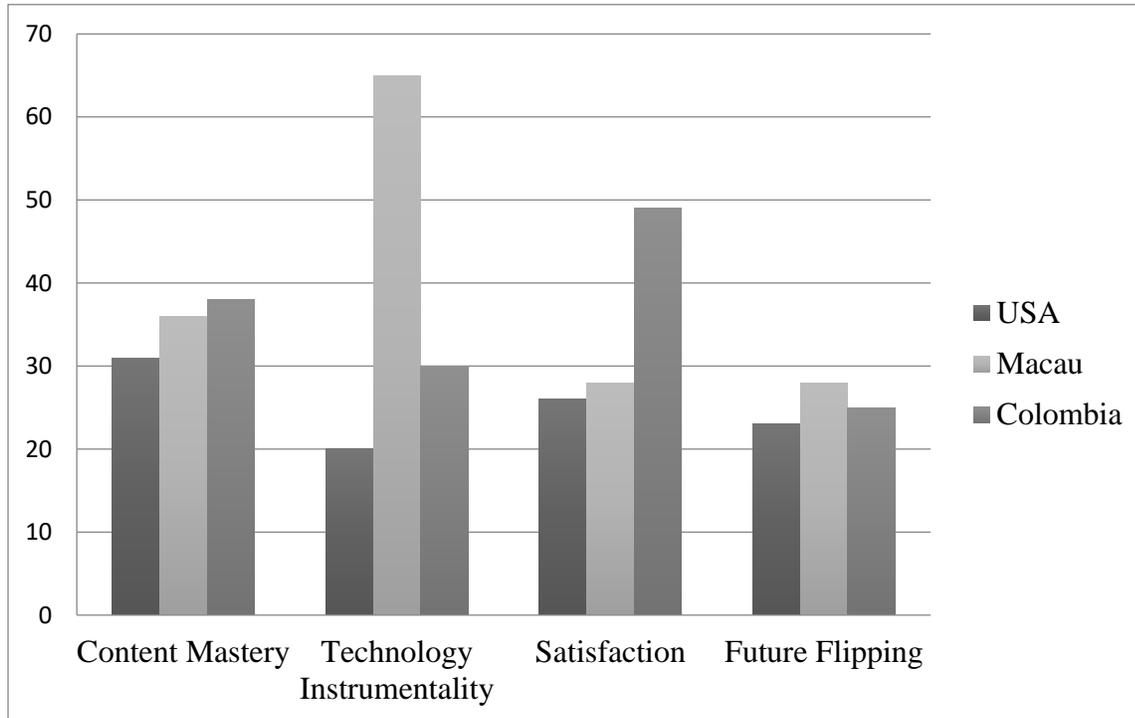


Qualitative excerpts from the data add support to the quantitative data.

Mastery of content was aided through the use of technology, which is supported by statements such as:

> We can use it (screencasting annotation assignment) to practice our presentation. We treat the screencast as if we are doing the real presentation. We can see the shortcomings and how to improve them. (Macau- SS1)

The instrumentality of digital literacy skills was promoted thorough the flipped model, as evidenced in the dialogue in the focus group session in the US.

> The technology is very difficult in the beginning. Sometimes I spent hours to learn it. (USA- SS2)

> So would you rather have a class with no technology? (USA – TT1)

> No, I am happy I learned the technology, because I can use it in my other classes. And later on the technology became easier and helped me to practice my English skills more. (USA- SS2)

Satisfaction with the flipped approach was also shown in the qualitative data.

Well… to learn how to write essays is very important and I think it is difficult, it is easier to speak but to write is more challenging. The instructions in the video were pretty useful, and as Jesus O.  just said, it was interactive.  Reading instructions is boring I prefer to watch them. (Colombia-  SS3)

**Discussion**

This study sought to examine the effects of the flipped approach to learning on students' digital literacy skills and attainment of content mastery.  An experimental design using pre-/post-test surveys as well as focus group session and reflective essays were collected as data.  The information gathered from the focus groups and reflective essays served to triangulate the findings from the technology surveys.  The findings from the surveys, focus groups, and essays were consistent across all contexts – of the US, Macau, and Colombia.

Four research questions were addressed in this study.  Regarding the first question of "Do students in flipped classes experience a change in attitude towards the use of technology for language learning over time?", the answer was clearly yes. As can be seen in the table 7, the USA group showed a statistically significant difference in attitudes across the four constructs from pre- to post-test time (i.e., from the beginning to the end of the course). Although, Students in each context as a whole did develop more favorable attitudes towards the use of technology for language learning. These results are consistent with Beach (2012) who found relatively high levels of student engagement through the use of digital tools. Overall, students appeared to have favorable attitudes towards technology use in the classroom.

The second research question asked, "Do students in a flipped class differ from students in traditional classes in their attitudes toward the use of technology for language learning?"  Students in the flipped classroom had attitudes that became more favorable over time. Specifically, ratings of instrumentality, digital literacy, and anxiety constructs became more favorable. Therefore, technology in the flipped classes helped aid in content mastery in English as well as students' own digital literacy skills.

"Does cultural context of instruction have an effect on students' attitudes toward the use of technology for language learning?" was the third research question. Data showed that in the beginning of the course students among all three contexts in USA, Macau, and Colombia had statistically different perspectives towards technology usage meaning that the student's opinions about technology were very different before starting the class. It is noted by the experience from all three researchers of this study teaching in Macau that students in Macau may feel much more comfortable with the use of technology compared to students in the U.S. or Columbia. The only construct that had significance at pre-test time was instrumentality. The effect of instrumentality was not analyzed thoroughly in this study. Although, results show that Colombian students had the highest rating of instrumentality followed by Macau, and U.S. contexts. This would go contrary to the researcher's beliefs that students in Macau value using technology the most out of the 3 contexts. At the end of the course, although significance was minimal, attitudes were favorable among all three countries. This shows that flipping the classroom was a viable pedagogy in each context regardless of class type or participant backgrounds. Though the students may have started out with differing opinions, by the end of the courses they all left with a similar understanding of the role of technology in language learning.

Finally, the fourth research question was "What do students in flipped classes think about the use of technology for language learning? Do they share common attitudes and perceptions? If so, what are they?" Students felt that technology:

- Aids content mastery of English skills
- Is important to learn for their future careers and classes
- Helps to stay organized, preview/review/practice class materials
- Is more engaging than traditional textbook/teacher-fronted classes
- Provides more opportunities to practice English skills

In conclusion, researchers were surprised to learn about the results of this study in that among three completely different countries students in the flipped classroom ended with a positive outlook of the new framework. Teachers globally may have questioned whether the model was viable to their context in the past, although this study supports the idea that the flipped model is applicable in classrooms around the world. For teachers that are afraid about using technology, or worry that their students will not adjust to the use of video recorded lessons, it is important to note from this study that students value the use of technology and overtime their anxiety will diminish.

Access to technology may be an issue for teachers in countries that are still developing. For them, researchers in this study recommend a slow, gradual shift towards the flipped methodology by integrating one or two video recorded lectures over a semester. Using free Web.20 tools such as Screen-Cast-O-Matic, Canvas, Edmodo, or Quizlet are easy ways to get started providing content and out of classroom discussions for students at home.

**Limitations**

This study is not without limitations. First, there was no formal assessment of English skills/SLOs in this study, although this aspect was studied in a follow-up study in USA/Macau to assess improvement in students' grammar skills through flipping the classroom using a control/experimental design, and another study in Colombia is also being conducted which will compare SLOs in control/experimental groups based on assessment scores. The fact that the researchers were also the teachers of the flipped classes may have [positively] influenced the results this study. Due to curricular demands in each context, it was impossible to teach the same materials. The nature of the classes was slightly different, with the US class focusing on speaking and listening, but the Macau and Colombia groups being more integrated with all four skills. Thus, with curricular content not controlled for, the data may not have been exact.

The themes that emerged from student reflections and focus groups were likely influenced by the questions used to prompt responses. Future studies should use more open-ended qualitative measures (e.g., ethnographic methods).

**Conclusions**

This article has detailed an ongoing study of the applications of the flipped classroom to university level ESL/EFL classes as a way to promote digital literacy and the attainment of course content. This study has shown that student nationalities and backgrounds do not prevent success with the flipped model, and

that the flipped model is applicable to any ESL/EFL environment.  Results also show that the length of a course does not prevent success with the flipped model, though contact hours may aid success. In the current study, students were given an average of 50 contact hours, which allowed students enough time to familiarize themselves with the new teaching approach and to reap the benefits, but shorter or longer courses seem to be as successful for a flipped approach to teaching and learning.  Whether or not the class is required does not prevent success with the flipped model.

Students value 21st century skills today, and as responsible teachers, we owe it to them to integrate technology into education as a way to help students to attain these skills.  Thus, ESL/EFL teachers in all contexts should consider flipping to promote digital literacy skills, content mastery, and engagement in their classes.  Based on this study, it is our recommendation that teachers and administrators spend more time training staff and students on the flipped concept prior to implementation.  The flipped classroom requires a great deal of planning and activities must be front-loaded in order for the flipped approach to succeed.  However, given the qualitative and quantitative data which has been provided here and in additional studies, the authors are of the opinion that the flipped approach is a viable pedagogy that helps to address students' needs in the 21st century.

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**Appendix 1**

Technology Survey

Please answer the following questions **honestly** and **to the best of your ability**. The survey should take you between 5 - 10 minutes.  If you don't understand something or have a question, ask your teacher!

1. Using technology is useful to me in my everyday life.

   Strongly Agree          Agree          Neutral          Disagree          Strongly Disagree

2. I feel nervous when I have to use computer programs like Microsoft Word, Google Documents, Power point, etc.

   Strongly Agree          Agree          Neutral          Disagree          Strongly Disagree

3.  Watching online videos, reviewing power point presentations, taking online quizzes, and participating in online discussions and peer reviews can help me be successful in the future.

    Strongly Agree          Agree          Neutral          Disagree          Strongly Disagree

4.  I am comfortable using technology.

    Strongly Agree          Agree          Neutral          Disagree          Strongly Disagree

5.  I know how to record my voice or video and share the file with others on an online class page.

    Strongly Agree          Agree          Neutral          Disagree          Strongly Disagree

6.  Using technology is fun and exciting.

    Strongly Agree          Agree          Neutral          Disagree          Strongly Disagree

7.  I know how to upload files such as writing assignments or Power point presentations on a class page.

    Strongly Agree          Agree          Neutral          Disagree          Strongly Disagree

8.  My past teachers have used an online class page so that we can continue learning online through videos, power point presentations, online quizzes and I can understand how to use the online class page easily.

    Strongly Agree          Agree          Neutral          Disagree          Strongly Disagree

9.  I am comfortable using programs like Microsoft Word, Google Documents, Power point, etc.
    Strongly Agree          Agree          Neutral          Disagree          Strongly Disagree

10. Knowing how to upload assignments and participating on our online class page can help me succeed in other areas of my life.

    Strongly Agree          Agree          Neutral          Disagree          Strongly Disagree

11. When a teacher asks me to use technology I feel upset or worried.

    Strongly Agree          Agree          Neutral          Disagree          Strongly Disagree

12. I know how to use computer programs like Microsoft Word, Google Documents, PowerPoint, etc

Strongly Agree          Agree          Neutral          Disagree          Strongly Disagree

13. A classroom that uses technology can help me with my academic and career goals.

Strongly Agree          Agree          Neutral          Disagree          Strongly Disagree

14. I do not know how to upload assignments to a class page or how to participate on an online class page and doing so makes me nervous.

Strongly Agree          Agree          Neutral          Disagree          Strongly Disagree

15. I can easily understand how to learn and communicate on an online class page.

Strongly Agree          Agree          Neutral          Disagree          Strongly Disagree

16. I am worried when my teacher uses an online class page.

Strongly Agree          Agree          Neutral          Disagree          Strongly Disagree

**Appendix 2**

**Flipped Classroom**

**Focus Group Questions**

1. Do you think the online videos and Powerpoints that you watched at home helped to develop your English skills?  If so, which skills do you think were developed?  Provide an example of one useful video or PPT that you think was helpful.

2. Were the flipped classroom activities and lessons conducive to learning English?  Provide an example of one useful activity or lesson that you think was helpful.

3. We often had quizzes in class to test your understanding of the materials at home.  Were these quizzes helpful for you to learn the new information?

4. Because of the flipped teaching methodology, we are able to do more communicative and collaborative pair and group work in class.  Did you enjoy these activities?  Which activity was the most impressive for you?

5. Do you believe that your English class this semester was one of the most student-centered classes you have had in university so far?  Why or why not?

6.  Technology was a key ingredient to our flipped classroom.  Which technology do you think was the most conducive to learning English?

7.  Would you like to see more technology being used in and outside of class for learning English?  Give some examples of technologies you would like to use more often.

8.  Would you prefer to have more online instruction or more teacher instruction in your English class?  Or was the balance sufficient in this class.  Provide details.

9.  Did the flipped approach help you to maintain better relationships with your classmates?  And with your teacher?  Why or why not?

10.  Would you like to have another class which uses the flipped approach to learning?  Why or why not?

**Appendix 3**

**Reflective Essay Prompts for Experimental Groups in Macau**

The purpose of this reflection is for you think carefully about the work you have done in this class and comment on your course progress so far. Read the questions below to guide your reflection.

There is no page length, but make sure you answer each question. (I recommend checking-off or crossing-out each question as you answer it to stay organized.)

*The reflection will be graded out of 6 points. If you answer each question thoughtfully, you will receive full credit for this assignment. Please type this reflection in Times New Roman Font size 12, Double Spaced, Titled Mid-Semester Reflection, place your name, date, and class in the left hand corner. Upload this assignment to Moodle for credit before November 13, 2014 at 5pm.*

For your <u>pair and group work activities</u>, I would like you to comment on the following:

- How well have you been able to work in groups? If you've worked well, what made it work well? If not, what improvements can be made for future group work activities and assignments?
- Here is a list of some of the group assignments we have done so far:  plagiarism games and worksheets, group annotation and peer review, running dictations (memorizing and writing down), paraphrasing game, Socrative quizzes,  powerpoint quizzes where you wrote the answer on the Ipads with Todaysmeet.com, jigsaw readings (read in one group and then teach another group), writing an group essay on Google Docs., group presentations (on a visual), group PSA storyboards, and many more.
- Do you like the way that I assign pairs by matching photos, matching words, standing in a line, choosing names on paper, etc?  Would you like to choose your own partners?

For your <u>individual assignments</u>, I would like you to comment on the following:

- Have you been able to submit your work on time? If yes, what strategies do you use to make sure that you submit your work on time? If no, what strategies do you think you need to use to make sure that you can submit future work on time?
- Many of the individual assignments have been to watch videos and make a comment either orally on Voicethread or on Moodle forum (written). You were also graded for your individual annotation, summary and response. Did you enjoy the assignments that I asked you to do?

For your <u>in-class participation</u>, I would like you to comment on the following:

- How satisfied are you with your level of participation in class? Are you actively using English for communication when you can? If you are satisfied and active, what strategies do you use to make sure that you remain satisfied and active? If not satisfied and not active, what strategies do you think you need to use to make sure that you can contribute fully when you are in class?
- Do you enjoy opportunities to get participation points? Do you volunteer during each class to get more participation points?
- Every day, you keep an action log and turn it into me. What do you think of this action log? Does it help you to reflect on what you did in class? Do you enjoy the feedback that I provide on your action logs?
- What are other ways that you suggest that I could use to get students to participate?

For your <u>independent learning (IL)</u>, I would like you to comment on the following:

- How often have you engaged in independent learning this semester? What have you enjoyed most about your independent learning activities? How important do you think independent learning is to your success in studying English? Is there anything you would like to do for independent learning, but haven't had a chance to do yet?
- Do you enjoy writing about IL on Twitter? Why or why not?
- Do you enjoy keeping an IL log on paper and turning it in? Why or why not?
- Does the Moodle Glossary help you to learn new words?
- What are your favorite IL sites? Which ones have you done the most?

For your <u>graded assignments</u>, I would like you to comment on the following:

- How satisfied are you with the grades (marks) you have received so far? If you are satisfied, what behaviors/habits do you think contributed to the marks you received? If you are unsatisfied, what do you think you should do to improve your marks? Be as specific as possible.
- So far, you have only received grades on the annotation, summary and response.  Do you think the grades were fair?  Why or why not?

For your <u>individual presentation</u>, I would like you to comment on the following:

- What did you learn about yourself from this video presentation? Is there anything that you think you can improve on? Is there anything that you thing that you did well on? Be as specific as possible.
- You have had many opportunities to make presentations in class, either individually or with a small group. What did you learn from these?

For <u>technology</u>, I would like you to comment on the following:

You have had many opportunities to use technology in this class and at home.  Please comment on each of the new technologies that we used for language learning.

- 1. Voicethread
- 2. Google Docs.
- 3. Today's Meet (we did this on the Ipads)
- 4. QR reader (inigma)
- 5. Screencast-o-matic
- 6. Moodle forum (to post writings)
- 7. Moodle glossary
- 8. Moodle Poodle (you did your first introduction there)
- 9. Any sites you did alone on the IL site (like Free Rice, Coconut Vowels, etc.)
- 10. TED talks
- 11. Show Me (on Ipads)
- 12. Snakes and Ladders (on Ipads)
- 13. MovieMaker
- 14. Twitter
- 15. My Popplet
- 16. Storyboardthat
- 17. Socrative quizzes
- 18. Bubbl.us
- 19. What other technologies did you use for this class?  For making vidoes?

For the <u>flipped class</u>, I would like you to comment on the following:

The flipped class requires you to watch videos or screencasts at home, to do more reading at home and to do more homework to prepare for class.  This allows time in class to be spent on doing activities which allow you to apply what you have learned.

The flipped class is very different from a traditional class – which is usually lecture-based and teacher-centered.  The flipped class embraces active learning and is very student-centered.

- How satisfied are you with the flipped approach to teaching and learning?  Is this style of teaching very different from the style of teaching in your other classes?  How?
- What did you like most about the flipped approach?  Give specific examples of activities that you liked.
- Did the flipped approach help you to learn the materials?
- Would you like more flipped classes?
- How could I make your flipped classes better?  Please give concrete examples of what you would like to do?

For peer review, I would like you to comment on the following:

- We often did peer review in this class.  For example, you peer reviewed your partner's annotation, summary and responses several times.  You also gave peer review on presentations and on storyboards.  Has peer review helped you?  Why or why not?
- Would you like to do more peer review?
- Do you feel comfortable giving feedback to your classmates?  Why or why not?
- Do you think that I have trained you sufficiently for doing peer review?  How could I better prepare you to give and receive feedback from your peers?
- Do you think that peer feedback is as helpful as teacher feedback?  Why or why not?

**Appendix 4**

Total number of Participants
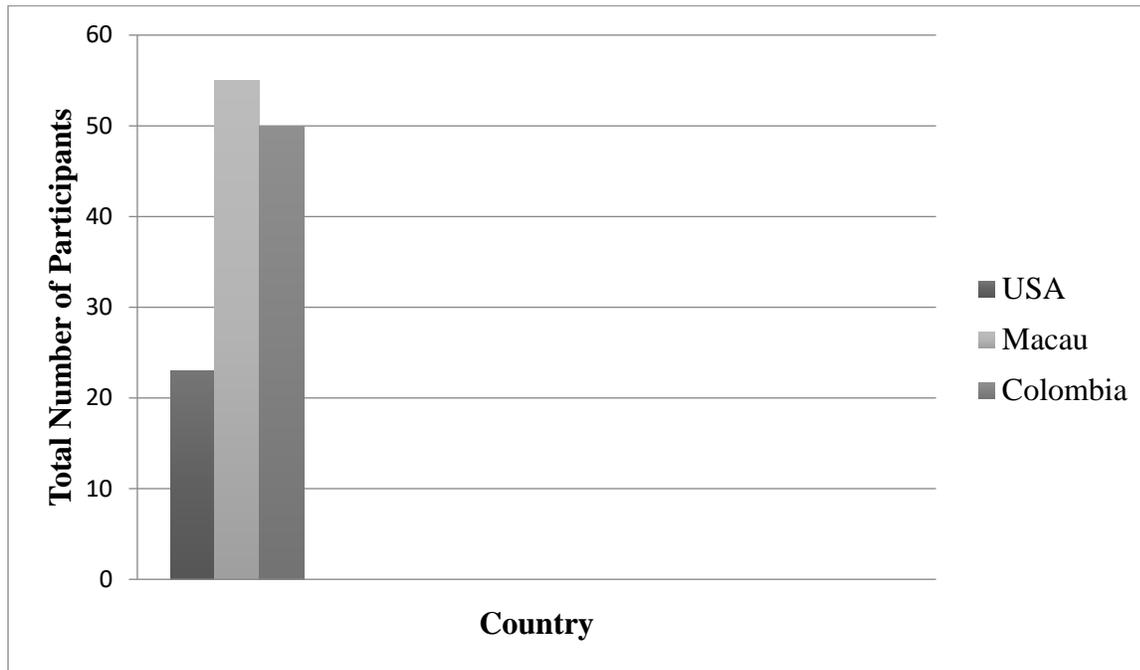


**Appendix 5**

*Reliability Coefficients of Technology Survey and Subscales*

| Scale | No. of items | Cronbach's α coefficient |
|---|---|---|
| Complete survey | 16 | 0.873 |
| **Subscales** | | |
| Instrumentality | 4 | 0.617 |
| Comfort | 4 | 0.688 |
| Digital Literacy | 4 | 0.795 |
| Anxiety | 4 | 0.826 |
| *Note. Acceptable reliability for Cronbach's alpha is≥.70* | | |

**Appendix 6**

*Correlation Coefficients (Spearman's Rho) between subscale items*

| | INST_1 | INST_2 | INST_3 | INST_4 |
|---|---|---|---|---|
| INST_1 | - | | | |
| INST_2 | .232** | - | | |
| INST_3 | .146* | .414** | - | |
| INST_4 | .226** | .290** | .411** | - |

| | COMF_1 | COMF_2 | COMF_3 | COMF_4 |
|---|---|---|---|---|
| COMF_1 | - | | | |
| COMF_2 | .435** | _ | | |
| COMF_3 | .287** | .253** | _ | |
| COMF_4 | .414** | .334** | .401* | - |

| | DIG_1 | DIG_2 | DIG_3 | DIG_4 |
|---|---|---|---|---|
| DIG_1 | _ | | | |
| DIG_2 | .557** | _ | | |
| DIG_3 | .412** | .541** | _ | |
| DIG_4 | .445** | .472** | .517** | _ |

| | ANX_1 | ANX_2 | ANX_3 | ANX_4 |
|---|---|---|---|---|
| ANX_1 | _ | | | |
| ANX_2 | .531** | _ | | |
| ANX_3 | .483** | .656** | _ | |
| ANX_4 | .496** | .714** | .667** | _ |

*Note*. INST = Instrumentality; COMF = Comfort; DIG = Digital Literacy; ANX = Anxiety; **P <.01, *P<.05.

**Appendix 7**

*Pre-to post-test comparison of attitudinal rating within the USA flipped group*

| Construct | Pre-test mean rating | Post-test mean ratings | z | p-value(2-tail) |
|---|---|---|---|---|
| Instrumentality | 2.07 | 1.67 | -3.11 | .002* |
| Comfort | 2.55 | 2.03 | -3.48 | .001* |
| Digital Literacy | 2.75 | 2.02 | -3.62 | .000* |
| Anxiety | 2.97 | 2.42 | -2.10 | .036* |

*Note. Wilcoxin Signed Ranks Test, z=1.96; *P < .05.*

**Appendix 8**

*Pre-to post-test comparison of attitudinal rating within the Macau flipped group*

| Construct | Pre-test mean rating | Post-test mean ratings | z | p-value(2-tail) |
|---|---|---|---|---|
| Instrumentality | 1.83 | 1.87 | -0.48 | .632 |
| Comfort | 2.18 | 2.16 | -0.32 | .752 |
| Digital Literacy | 2.11 | 1.79 | -1.65 | .099 |
| Anxiety | 2.09 | 2.09 | -0.48 | .631 |

*Note. Wilcoxin Signed Ranks Test, z=1.96; *P < .05.*

**Appendix 9**

*Pre-to post-test comparison of attitudinal rating within the Colombia flipped group*

| Construct | Pre-test mean rating | Post-test mean ratings | z | p-value(2-tail) |
|---|---|---|---|---|
| Instrumentality | 1.84 | 1.81 | -0.24 | .807 |
| Comfort | 1.90 | 1.91 | -0.19 | .853 |
| Digital Literacy | 2.09 | 1.94 | -1.21 | .228 |
| Anxiety | 2.01 | 1.80 | -1.54 | .123 |

*Note. Wilcoxin Signed Ranks Test, z=1.96; *P < .05.*

**Appendix 10**

*Pre-test difference in attitudinal ratings between flipped and non-flipped groups*

| Construct | Mean rank | | z | p-value(2-tailed) |
|---|---|---|---|---|
| | Flipped | Non-flipped | | |
| Instrumentality | 53.85 | 74.51 | -3.203 | 0.001* |
| Comfort | 63.76 | 63.76 | -0.222 | 0.824 |
| Digital literacy | 63.34 | 65.59 | -0.348 | 0.728 |
| Anxiety | 68.14 | 61.08 | -1.087 | 0.277 |

*Note. Mann-Whitney U, z=1.96; *p <.05; Flipped n=62; Non-flipped n=66.*

**Appendix 11**

*Pre-test comparison of mean attitudinal ratings among flipped students across contexts*

| Construct | Context | Mean Rank | Chi-Square | p-value |
|---|---|---|---|---|
| Instrumentality | Colombia | 37.22 | 4.056 | 0.132 |
| | Macau | 27.21 | | |
| | USA | 29.00 | | |
| Comfort | Colombia | 39.20 | 10.481 | 0.005* |
| | Macau | 32.58 | | |
| | USA | 21.63 | | |

| | | | | |
|---|---|---|---|---|
| | Colombia | 41.07 | | |
| Digital Literacy | Macau | 26.45 | 10.662 | 0.005* |
| | USA | 25.30 | | |
| | Colombia | 42.74 | | |
| Anxiety | Macau | 27.42 | 15.196 | 0.001* |
| | USA | 22.45 | | |

*Note. Kruskal-Wallis Test, *p<.05, Colombia n=20; Macau n=19; USA n=23.*

**Appendix 12**

*Pair-wise Comparisons of Mean Attitudinal Ratings Among Flipped Students Across Contexts at Pre-test Time*

| Groups Compared | Construct | z | p-value (2-tailed) |
|---|---|---|---|
| Colombia X Macau | Instrumentality | -0.35 | .726 |
| | Comfort | -2.01 | .044* |
| | Digital Literacy | -0.19 | .852 |
| | Anxiety | -0.95 | .341 |
| Colombia X USA | Instrumentality | -1.57 | .117 |
| | Comfort | -3.13 | .002* |
| | Digital Literacy | -2.91 | .004* |
| | Anxiety | -3.62 | .000* |
| Macau X USA | Instrumentality | -1.82 | .069 |
| | Comfort | -1.28 | .201 |
| | Digital Literacy | -2.63 | .009* |
| | Anxiety | -2.83 | .005* |

*Note: Mann-Whitney U, z=1.96; *p<.05; Colombia n=20; Macau n=19; USA n=23.*

# Teachers' Perception of the Role of a Technology Integration Coach, an Ethnographic Case Study

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**Abstract**

In the last twenty years, a wide variety of technological tools have emerged to assist classroom teachers who instruct students with LD. However, teachers are either unaware of technology tools or lack guidance to help choose appropriate technology tools and use them efficiently. This ethnographic case study identified classroom teachers' perceptions of the role of a technology integration coach (TIC) in learning new technologies. The researcher collected data through questionnaires, formal and informal interviews, observations and archival data. The final analysis provided a list of themes and a TIC job description from data derived from the research.

*Keywords*: instructional technology, elementary education, computers, classrooms, students with learning disabilities, inclusion

**Introduction**

The amount of technology that is available to public school teachers has grown substantially over the last fifteen years. In 1995, only 35% of the public schools had access to the Internet. Less than a decade later in 2003, 100% of schools had Internet access (NCES, 2005). Similar statistics show that in instructional rooms (classrooms, libraries and computer labs) only 3% of the computers had Internet access in 1993, while in 2005 that has grown to 94%. According to the National Center for Educational Statistics (2005) there is an average of 3.8 students per computer with Internet access in American schools, and 10% of school districts have a laptop-lending program for students. DeBell and Chapman (2006) stated that 46% of students in the United States use the Internet to complete assignments. School districts have the technology, but have little support for teachers to learn how to integrate the technology into their classes. Teachers have a desire for training from an expert, a reference list or some standards whereby they can modify their current curriculum through implementation of effective technology techniques (Frazier & Bailey, 2004).

A study conducted in 1989, showed that instruction that was supported by technology played an important role in special education (Carnine, 2000); and although beneficial for all students, technology supported instruction has greater potential for students with disabilities (Maccini, Gagnon & Hughes, 2002). With this information in mind, we need to ask ourselves why classroom teachers do not use technology on a consistent basis for students with learning disabilities. Classroom teachers struggle to adapt to technology in order to meet the needs of the learning disabled in the classroom with little guidance or resources.

**Statement of Problem**

Teachers lack knowledge of computer-based teaching methods and resources to help them implement technology in a way that will help the retention, generalization, and transferability of knowledge for students with LD. Schools hesitate to hire a technology integration coach (TIC) to assist teachers in learning new methods of using technology as a teaching tool although the need for the role is increasing (Cole, Simkins & Penel, 2002). As the use of computers in schools grows, so has the need to develop ways to incorporate the new technologies into a practical framework that helps students learn more. This has left teachers feeling unprepared and anxious about using computers in the classroom (Watson, 2006). Computer technology has become effective in increasing educational opportunities, but teachers, even those who are considered to be proficient with technology, do not consistently integrate technology into their classrooms (Bauer & Kenton, 2005). Norman (2000) reported only 20% of teachers surveyed in their study felt prepared to integrate technology into the classroom. In another study showing 33% percent of the teachers feeling prepared, while the majority still felt inadequate in using computers (NCES, 2005).

**Purpose of Study**

The purpose of this study was to observe and better understand how classroom teachers perceive the role of a TIC in learning technology integration. A qualitative ethnographic case study analyzed ways teachers use technology in classroom settings to assist the acquisition, retention and generalization of new information. The study also observed interactions between teachers and a TIC to better understand the relationship between both parties.

**Review of Literature**

Technology in the classroom consists of electronic tools that improve teaching and learning, including computer centers and listening stations that are part of a well-planned lesson (Ebert & Culyer, 2008). Types of software used by teachers and students include word processing, CD-Rom, world-wide web, games and drills, simulations, graphics, spreadsheets and databases, multimedia authoring and e-mail (Becker, 2001). Technology used for individual instruction is often referred to as computer-based instruction. Computer-based instruction, used in classrooms for over 35 years, presented individual students with short units of instruction and then asks questions to test the student's comprehension of the material (Smith & Broom, 2003). Many teachers use the computer for drill and practice, although there is considerable criticism for this instructional practice (Chipman, 2003). Title 1 U.S. Federal funds, also known as compensatory funds, have supplemented schools financially to encourage the use of computers so students that need more practice have the ability and resources to get it (Chipman, 2003).

Instructional Technology methods include using existing data to deliver instruction and also to deliver portions of instruction that supplement the communications of an instructor (Gagne, 1987).

The use of technology in the classroom becomes more commonplace every school year (Smith & Broom, 2003). The goal has shifted from having technology in the classroom, to school personnel seeing technology as an instructional tool for accomplishing and articulating an educational goal (Pitler, Hubbell, Kuhn & Malenoski, 2001). Computers are relevant enough in public schools that teachers need to make a shift from learning how to use technology to implementing technology into lessons (Ringstaff & Kelley, 2002). Teachers who facilitate the effective use of technology create opportunities for students to have meaningful learning in an open and supportive environment where diverse learners' needs can be met (Morrison & Lowther, 2002). Classrooms become more student centered when technology tools are used with problem solving tasks (Morrison & Lowther, 2005).

The statistics that reinforce the need and desire for students to learn with the help of technology is astounding.  Half of high school students could use mobile technology in the classroom, but unfortunately, only 15% of teachers support this idea (Prensky, 2008). According to DeBell and Chapman (2006) in the United States, about 46% of students use the Internet to complete school assignments. Students feel that traditional lectures are boring compared to the vibrancy of the media saturated, tech driven world (Prensky, 2006). Technology also affects the way teachers prepare and deliver lessons. For instance, 86% of teachers in a recent large study claim that technology affects the way they teach "a great deal" or to "some extent" (Prensky, 2008). When students find lesson-appropriate web sites and are able to navigate to the information that is needed, they find the process motivating and memorable (Tienken & Achilles, 2003).

**Research Design/Strategy**

The researcher was curious about how teachers would utilize a TIC to help meet the needs of the learning disabled in classroom settings and used an ethnographic study to describe, interpret and understand a particular action or behavior of a population (Vockell & Asher, 1995). The researcher did not make judgments of the teacher's use of technology, but rather she looked for behavioral patterns of the teachers when they used the information about technology provided by the TIC. (Vockell & Asher, 1995).

*Context of Study*

The study took place at an elementary school in a rural city, population of 25,737 as of June 2007 (Citydata.com).  The research school has 69% of students of Hispanic origin; the high percentage is very common in school districts in the southern states.  Students who qualified for free or reduced lunch were 255 students, which is seventy-eight percent of the population. The school has twenty-four full-time certified teaching positions; fifteen are classroom teachers, two special educators, two physical education teachers, one counselor, and one librarian.

The research school was constructed in 1957 and has struggled like many older schools with implementing technology.  There has been a steady accumulation of technology available to the schools throughout the years.  During the school year of 2008-2009, each teacher was given a laptop to replace their personal computers (PC). In the summer of 2009, each classroom was furnished with a projector so

that teachers may utilize their laptops for instructional purposes. In the middle of the research year, each classroom teacher also received a Mimeo, a portable interactive board.

*Data Sources*

The teachers were selected for participation based on the following qualifications: 1) taught classroom core subject, Math, Language Arts, Social Studies or Science; 2) provided instruction for learning disabled peers in an inclusion setting; 3) had access to student computer labs and a media center with a computer projector and 4) were willing to participate in the study. Basic demographic information of the participating teachers was collected with an online form. The participants taught grades Kindergarten through fourth grade. Their years experience in the field of education ranged from 3 years to 21, with an average of 9 years. The technology they were familiar with included personal computers, projectors, Mimeo, MP3 players, Microsoft Office Suite and various other educational software.

*Role of the Researcher*

The researcher followed the role of a TIC as outlined in the Technology Coordinator's Handbook, by Frazier and Bailey (2004). Frazier and Bailey stated that one of the major roles for a district technology coordinator is the role of teaching and learning.  The authors believe that technology coordinators who have classroom experience have a better understanding of the culture of the school and the demands of working with students. The role of a TIC is growing rapidly in many school districts across the nation (Cole, Simkins, & Penul, 2002). The TIC works with the school staff to help insure that the technology is used to the greatest extent possible (Sugar, 2005).  This case study utilized the TIC job description to assist teachers at an elementary school to help integrate the use of the technology into the curriculum. The researcher was an active participant observer, taking on the role of a TIC and, in the process attempted to describe, interpret and understand the role and how it assists both the teacher and the students (Vockell & Asher, 1995). She was present at the school one to two days a week providing teachers with assistance, guidance and suggestions on how to implement the technology into their lessons.  A schedule of after school and in-service teacher trainings, one-to-one tutorials, demonstrations and just-in-time assistance were provided to the teachers.

During the first phase the researcher acted as the school TIC. She took notes and documented interactions with the teachers. These notes were later used for archival purposes. In the second phase of the field work, the researcher not only acted in the role of a TIC, but also collected data, conducted interviews, and observed classrooms.

*Data Collection Methods*

Data was collected through interviews (formal and informal), questionnaires, observations, and archival data. This combination of data collection was used to answer different research questions and to provide multiple data sources to strengthen the overall findings (Darlington & Scott, 2002).

Over the course of a school year the researcher took on the role as a technology integration coach (TIC). The researcher helped teachers learn how to use the technology the district had provided and to find other technologies available through the internet. During this time the researcher documented every

meeting, conversation and observation while she was at the school. The purpose was to identify how teachers perceive technology in the role of the TIC.

The questionnaires that were used consisted of open-ended questions that allowed the teachers' views and ideas about technology to take precedence over the researcher's thoughts and does not impose any artificial constraints upon the teachers (Vockell & Asher, 1995). (Appendix C) Informal interviews, which resembled conversation, happened during times the research was taking on the role of the TIC during or after workshops and in-services. This allowed the interviewer and the person being interviewed an opportunity to establish and better develop rapport. Formal interviews, conducted by a proctor, allowed the researcher to ask very specific questions and draw responses from the person being interviewed in their own terms. After rapport was established, during the time TIC was at the school, data was collected through observations. Archival data collected documents was used for content analysis, where the researcher looked for common themes and concepts in the natural language. These included TIC notes from fieldwork, teacher submitted items during the time the TIC was at the school, lesson plans collected during one week in fall semester and one week in spring semester.

As an active observer participant, the researcher was able to integrate into the schools culture, become a member of the school and attempt to identify these teachers perception in these areas. The researcher practiced triangulation by collecting data through interviews, classroom observations, questionnaires and archival data. The researcher spent an extended amount of time at the research setting that ensured trustworthiness at the research site. Member checks and peer debriefing were also employed to ensure that the field notes were actual documentation of the actual occurrence and that interpretation of the data was interpreted correctly.

**Findings**

There are various types of technology available to teachers at the research site. Acting as a TIC, the researcher was able to work with the teachers to learn how to integrate the available technology into the curriculum. The following section describes in detail and provides examples of the data that support the analysis of the themes and subthemes.

Two major themes emerged: the teachers' perceptions of the tutorials, and the teachers' perceptions of the outcomes of having a TIC at the school.

*Tutorials*

Throughout the year the researcher provided five major ways to assist teachers with technology. Teachers learned new technology methods during just-in-time assistance, weekly after-school workshops, planned conferences through the week, teacher in-services days, and requested specific information via email or notes in the TIC school mail box.

Just- in-time assistance happened at times when a teacher had a technology question or issue that needed immediate attention. Since the TIC was not at the school fulltime, these situations were not very common; however formal interviews revealed that teachers would utilize just-in-time assistance more often. Examples of how the TIC assisted with just-in-time assistance were;

- Adjusting the projector screen on the white board in the middle of a lesson,
- Helping a teacher navigate Microsoft Outlook after the district converted from another communication program,
- Aiding a teacher in recovering data from a jump drive, and
- Provide trouble shooting for the Mimeo's after they were installed.

Once a week the researcher held after school workshops located in a computer lab at the research site. The workshops lasted an hour, with about twenty to twenty-five minute instruction on specific technology of the workshop, then with the remainder of the hour for the teachers to practice the technology themselves. While the teachers practiced the new skill the researcher assisted the teachers as needed. The formal interviews revealed that the teachers thought the guided practice while the information was new to them was important.

> "Most of the lessons that she has done after school have been out in the lab where we can access and she can demonstrate using the projector and then we can just go for it. And then we can play with it and practice."

Another way that the researcher was able to provide technology trainings to the teachers was through planned meetings with the teachers throughout the week. The teachers could ask the teacher to meet with them at a certain time that was convenient to the teacher, using email, a sign-up sheet or an in person request. Three teachers even arranged designated times every week to meet. The topics of the trainings varied according to what the teacher wanted to learn. These topics included: Picture managing, Voki.com, Microsoft Calendar, Technology Trick or Treat, Jotform.com, PowerPoint, Teacher In-services, Microsoft Outlook, and Top Ten Technology Tools.

The teachers utilized the just-in-time tutorials, the after-school workshops and the planned tutorials, but the type of tutorial most utilized was when the teacher requested specific information. These types of tutorials differed from the planned tutorials in that the teachers knew exactly what they needed and requested very specific items, instead of being open to suggestions. Below you will find examples of the emails and conversations the researcher had that demonstrate the requested specific information tutorials.

> [Teacher] is working on a Student Satisfaction survey and wanted to create something online that will auto score and calculate results.

> [Teacher] wanted a spreadsheet that gave percentages and a total percentage of all the skills together.

> [Teacher] wanted to get some suggestions on how to use her mimeo to help students with spelling.

The specific requested information tutorials were a wide spectrum, these subjects were: Microsoft Outlook, kid friendly websites for references and supplemental instruction, Microsoft Office

applications, online surveys, suggestions for specific student need, understanding software upgrades, find tutorials for teacher's specific needs to learn technologies, provide refresher courses in various technologies and assisting with hardware issues.

**Outcomes of Having a TIC**

There were several outcomes from having a TIC in the school for the year.  When the researcher analyzed the data collected during formal interviews several themes emerged. Below is a list of the themes and the supporting comments from participants and the notes from the researcher.

*Teachers learn technology faster than without a TIC*

…we have had some technology added to our school and she helped us learn how to use that maybe quicker than if we had to learn it without somebody here.  (Teacher)

*Easier to find information and integrate them creatively into the curriculum*

Besides the basic "how to…" she has shown us how to find things and how to integrate them into teaching, so it has made things a lot easier. (Teacher)

*Desire to have a TIC that is more available*

I think if the TIC was actually based in the building all the time, or at least several days a week, that person would be able to see what I was planning and actually look at my lesson plans actually say, hey, here's a way that you can use technology with that. (Teacher)

*Teacher's desire to learn more*

I would like to get better at using technology as sort of a natural flow in teaching, I have to work at putting it in and I would like to get better at that. (Teacher)

*Teachers feel more comfortable with technology*

I feel comfortable using technology to some degree. More comfortable then I used to be. (Teacher)

Desire for workshops that include time to practice new technologies.

Most of the lessons that she has done after school have been out in the lab where we can access and she can demonstrate using the project and then we can just go for it. (Teacher)

**Discussion**

The researcher defined and described how do classroom teachers perceive the role of a TIC in learning new technological methods. According to the results, the researcher perceived that teachers desire to have assistance in learning new technologies.  This finding is consistent with a study that showed that teachers prefer in-services that teach them technology skills that they can use with classroom computers (Wozney, Venkatesh & Abami, 2006). Teachers understand that technologies assist students in learning, but appreciate assistance in integrating technologies into their existing curriculum. The teachers want the TIC to be available on a regular basis, teach them techniques that they can use across the curriculum, provide consultation services based on lesson plans and state standards, demonstrate

technology through workshops and "just-in-time" tutorials, maintain hardware and provide technology support to keep everything working smoothly.

**Outcomes**

Several outcomes came to surface as the result of having a TIC available to the school for an extended amount of time. Teachers made mention that they were able to learn new technologies faster than if they would have had to figure it out on their own. When learning the new technologies in workshops or trainings they wanted to have time to have guided practice so they could experiment when the TIC was still available to answer questions. After having a TIC at the building for an amount of time the teachers were more comfortable in trying new technologies on their own and because of this comfort level they had an increase in their desire to learn more. The teachers also commented that they felt like they could creatively integrate technology in all areas of the curriculum. They would learn a new technology in one subject, but then where willing to try to generalize it to another subject on their own, without the assistance of a TIC. A final outcome was that they had a desire to continue to have a TIC available to the schools. The teachers were adamant about not wanting to share the TIC with several schools, but only one or two. The teachers felt that as technologies continue to change and expand, they desire a person who is in charge of keeping up with the changes and informing them of new ideas.

The results from this study are a launching block for educators and administrators everywhere. The results come directly from the trenches, ideas generated from teachers themselves. The research shows that teachers are generally interested in using technology to meet the needs of the learning disabled, they want and need to have assistance in learning these new technologies. Teachers feel that they are able to learn faster with the assistance of a TIC. The TIC provides a resource for the teachers for not only hardware issues, but actually implementing the technology techniques into existing curriculum.

*TIC Job Description*

After reviewing the data collected from the fieldwork the researcher was able to identify clear suggestions of what should be included in a general job description of a TIC. The suggested job requirements for a TIC that were derived from the data are demonstrated in the table located in Appendix B. These suggestions compliment the outlined role of a TIC in Frazier and Bailey's (2004) Technology Coordinator's Handbook, in the role of teaching and learning.

**Conclusion**

Technology is an education tool that will continue to be developed in the future. Grants, federal mandates, and private donations have made technology available to teachers. Teacher strive to use the technology that is available o them, but without support they often feel uncomfortable with the expensive equipment and unknowledgeable about various programs. This researcher has shown that teachers do feel technology has a place in the classroom, and it is useful to help level the playing field for students with LD. However, they would be able to learn new technologies faster, become more comfortable and proficient with a TIC who is readily available. Teachers want help learning new technologies that in turn will assist in creating differentiated activities for all their students.

School districts should take head to this research study as a call out from the teachers in the field that work with students every day. Listening to their responses to the questions asked and reading about classroom observation and informal interviews can be a wakeup call to administrators and boards of education. Teachers desire the tools and training to implement technology into the curriculum. They see and have experienced the benefits. Technology helps, teach them how to use it.

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## Appendix A – Questionnaire

## Appendix B – Job Description of a Technology Integration Coach

**The TIC will attempt to motivate teachers to learn new technologies.**

- Follow common adult-learning theory characteristics, making the subject matter relevant, listening to learners concerns, and
- Create a non-judgmental learning environment. Teacher need to feel comfortable asking for technology help without worrying about if the TIC thinks sit is trivial and elementary.

**The TIC will be available**

- The TIC will be available to the teachers when the teachers have time to learn. The TIC should not expect the classroom time to be compromised so that the teacher can learn a new activity, and
- Maintaining Technology and providing hardware support, such as equipment, communication, storage devices, and other equipment.
- The amount of time in building needs to be consistent and not divided in to no more than three schools.

**The TIC will Demonstrate technology**

- The TIC will provide workshops that include new ideas, repeated workshops for those who need re-teaching and have missed the last one, follow-up workshops to advance knowledge and identify where the teachers want to know more about,
- Workshops need to allow for teachers to use new technologies with support, and
- Workshops should have a limited amount of participants to ensure there is individual instruction.

**The TIC will provide classroom help to teachers**

- "Just-in-time" assistance will be provided when the teacher needs help with a topic immediately,
- Assist teacher, or team teach, during lessons to ensure that new technology methods are smooth and consistent to limit the amount of time spent of "waiting on technology", and
- Meet with the teacher when it is convenient to the teacher to assist with creating documents, spreadsheets, surveys, forms, and other examples of technology.

**Be aware and share new technology that is available**

- Research new Technologies,
- Create a way to inform teachers of new technology ideas to teachers,
- Create a website teachers can access for technology ideas, links for instructional use and TIC contact information, and

**Consult with administration and teachers on technology.**

- Give suggestions based on classroom observations, and past and current lesson plans at teacher request,
- Communicating regularly and being available to teachers and administrators,
- Suggest technology based on student needs,
- Suggest purchase of equipment,
- Suggest placement of equipment and furniture, and
- Initiate collaboration between teachers.

# Japanese Undergraduate Students' English Communication Problems and Learning Motivation Outside Formal Classroom Environment

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**Abstract**
This study explores current social and cultural factors related to Japanese university students' motivation and attitudes towards speaking English outside the formal classroom environment via a self-constructed questionnaire. The results indicated that although many of them had studied English for at least 8 years, they still experienced anxiety and lacked the necessary self-confidence in speaking English outside the classroom environment. A majority of them even tended to shy away from English-speaking situations and avoiding interactions with foreign speakers. This study also reflected that the student respondents in general had very limited exposure to English outside of the classroom. It was the unique cultural differences, as well as other social predispositions that resulted in these Japanese students' reluctance in using English for daily communication needs.

*Keywords: Teaching and learning; Higher education; Japanese speakers; social context; English application*

**Introduction**

One of the members of our research team is a faculty of the English-language library science program at a university in Japan. Based on his experience in delivering his lectures in the past few years, he encounters some questions and challenges constantly in this specific context:

- Why do my students become so shy and nervous when they need to speak English, both in and outside of the classroom?

- How can I help these students overcome their anxiety, and help them find English speaking a more enjoyable experience?

- Why do Japanese students have so much trouble simply saying 'Yes' or 'No', or feel so uncomfortable in expressing their own opinions?

- Why are Japanese students so passive, in their way of learning? Why are they so unwilling to take part in discussions?

Numerous attempts have been made to find ways to motivate the students, to help them take part more actively in basic discussions, or even just to "chit chat" with other foreign students on campus, without feeling embarrassed or being fearful of making mistakes in front of others. However, before such solutions are identified, there is a strong need to find out first the root causes of their "problems", i.e., what attitudes the Japanese students have towards the learning, as well as the daily use of the English language outside the formal learning environment. We would like to explore the social and culture factors behind such attitudes and their reluctance.

To the best of our knowledge, there are no recent studies on the motivation and attitudes of non-English speaking students in communicating in English outside of the formal classroom environment, especially for Japanese university students, while we observe severe problems still exist. The significance of this study lies in its contribution to the body of knowledge about the teaching and learning of the English language amongst Japanese university students. In addition, there has been a lack of research on the attitudes towards the English language held by library science students outside the formal learning environment in Japan.

**Background and research questions**

In this research, one of the issues that we would like to explore is attitudes of non-English speaking students in communicating in English outside of the formal classroom environment. According to Krech, Crutchfield, and Ballachey (1962, p. 29), they define attitudes in the social psychology context as "enduring systems of positive or negative evaluations, emotional feelings, and pro or con action techniques with respect to social objects". Dörnyei (1996) also states that learners with more favorable attitudes towards a second language and its speakers are likely to be more successful in language learning than otherwise.

English language learning and teaching can never be separated from social, cultural, and educational contexts. Therefore, it is important for educators to acknowledge students' preferences and attitudes in order to understand better and provide for the students' needs in their language learning. Careful investigation of student attitudes and the root causes such attitudes can help clarify the ways in which English education can be best adapted to suit student needs and requirements under their contexts. Therefore, this study aims to contribute new information on Japanese university students' attitudes towards using English for daily communication purposes, identifying different cultural and educational factors that are hindering students' language proficiency and self-confidence. The result of this study can also provide insight on understanding non-native English speaking students' attitudes towards using English for daily communication purposes.

Thus, in this research, we would like to investigate into the following research questions:

RQ1: What are the relationships between self-confidence and the level of oral English proficiency amongst the Japanese student participants?

RQ2: To what extent do Japanese students experience English-speaking culture or opportunities in their daily life outside university?

RQ3: How do student attitudes and perceptions affect their motivation and attitudes towards English learning?

**Methodology**

The participants of this study were upper division students at the University of Tsukuba in Japan. They were learning English as a foreign language, and were majoring in library and information science. A printed questionnaire (with both open and close-ended questions) was developed, and administered to the participants during their classes. The questionnaire was administered anonymously, with students not being required to identify themselves on the instrument. On the questionnaire, the students were also asked to record their overall comments about their feelings towards using English for daily communication purposes. In all, 111 completed questionnaires were received, representing 24% of the entire undergraduate population of the Faculty of Library, Information and Media Science. Out of all 111 students surveyed, 60% were female, with age ranging from 21 to 23 years. They all spent at least 8 to 10 years learning English in Japan. A majority of them (75.7%) have been stuying English since junior high school (see Table 1).

**Table 1.** The English language learning background of subjects (N = 111)

| Learning English Since | Number (in %) |
| --- | --- |
| Kindergarten | 2 (1.8%) |
| Elementary School | 21 (18.9%) |
| Junior high school | 84 (75.7%) |
| Senior high school | 2 (1.8%) |
| Not answered | 2 (1.8%) |

**Findings**

*Students' perceptions of the English language and English learning*

In order to probe into our subjects' perceptions of the English language and English learning, we explored this topic through three survey items. Our results are presented in Table 2. As shown in Table 2, a large number of our subjects found English to be a difficult language, but being important at the same time, especially for their future employment. Meanwhile, many of them agreed to treat English as the international language, since English is so widely spoken outside Japan. Such results indicated that

students viewed English being an increasingly important job skill in Japan that is facing increasing demands of internationalization. No doubt, with globalization and the role of Japan plays in the international market, English proficiency is naturally viewed as a desirable skill that will lead to better job opportunities after graduating from university. Unfortunately, the Japanese education system for English language does not seem to be performing adequately for preparing students with the language skills necessary for the job market. In fact, the results reflected that a majority of the Japanese students who have studied English for at least 8 years in Japan still has a difficult time in carrying out simple conversations with native English speakers. The reasons behind the students' language difficulties and their lack of self-confidence will be further discussed in the following sub-sections.

**Table 2.** Students' perceptions of the English language and English learning

| Response | Male | Female | Total |
|---|---|---|---|
| Question: Do you think English is important? | | | |
| Yes, I think English is very important. | 27 | 34 | 61 |
| Yes, I think English is only important for my future work. | 11 | 16 | 27 |
| Yes, I think English is only important in school & university. | 3 | 9 | 12 |
| Question: What do you think of English Language | | | |
| I think English is a very difficult language. | 13 | 31 | 44 |
| I think English is important for my future job/career. | 13 | 20 | 33 |
| I dislike/hate learning English, but I have to for my current area of study at university. And I will continue learning English even after university. | 10 | 17 | 27 |
| Question: What do you think about English as an international language? | | | |
| I think it is logical to make English the international language, since English is so widely spoken in many parts of the world. | 22 | 27 | 49 |
| This is why I want to learn English so much. | 9 | 14 | 23 |
| No comment. | 8 | 12 | 20 |

Note: Our subjects are allowed to select multiple answers in responding to these questions. We only present the top 3 most chosen responses in our analysis.

*English learning outside the university*

Given the current education system is not performing adequately in Japan, and students in general lacked the necessary confidence and initiatives to converse directly with foreigners, a majority of them did not see the benefits and the need of attending a private language school outside university. In fact, the results indicated that many students actually saw such private and small-class English teaching as a waste of time and money, as well as being too expensive. In fact, the majority of Japanese students did not attend a private language school. As Seki (2004, p. 139) explains, "these (private language) schools generally focus entirely on English conversation, taught by native English speakers. There are some problems with those schools, not least that the vast majority of the 'teachers' have no teaching experience or qualification, but also that they are expensive (standard annual tuition for one-hour lessons in the evening after work one or 2 days a week will easily cost around 2,000 or 3,000 pounds)". Seki (2004) further explains that the high tuition fees are probably the main reason why the majority of the students choose not to attend these private language schools "more often". In fact, many students of such private language schools are not university students, but working adults, who need to pass certain examination process, or feel the need of communicative English for their work or travel. Tables 3 and 4 summarize our findings in this aspect.

**Table 3.** Apart from your University seminars & lectures, how often you speak English in a week? (N = 108)

| Response | Male | Female | Total |
|---|---|---|---|
| Not so often. Because I am not so confident in speaking English. (Note 1) | 22 | 35 | 57 |
| Never! I just dislike/hate speaking English. (Note 2) | 6 | 11 | 17 |
| Not so often. Because I feel embarrassed & worry that other Japanese people might laugh at me. | 7 | 4 | 11 |
| Never! Because of other reasons. (Note 3) | 2 | 8 | 10 |
| Not so often. Because I feel embarrassed & worry that other native English speakers/foreigners might laugh at me. | 2 | 5 | 7 |
| Very often, almost every week. | 3 | 3 | 6 |

Notes:
(1) A female respondent indicated that, "Almost all people whom I met are Japanese, so I do have the opportunity to speak English".
(2) A male respondent explained that "I don't have to (speak in English)", in addition to disliking the language.
(3) A male respondent gave a reason for not having to speak English, i.e., because he had "No opportunity" to do so. In addition, some of the female respondents provided reasons for "Never" having to speak English outside of the university lectures, including "I don't have to speak English,

because my friends are Japanese"; "I don't have opportunity"; "I'm learning English in class (only)"; "I'm busy with job finding"; and "時間がないから = Because I have no time".

**Table 4.** Are you currently taking any private English lessons (outside the University)?

| Response | Male | Female | Total |
|---|---|---|---|
| No, I don't want to waste my time & money for private English lessons. | 23 | 30 | 53 |
| I want to take private English lessons, but I am already too busy with university assignments. | 10 | 12 | 22 |
| I want to take private English lessons, but private lessons are too expensive. | 5 | 17 | 22 |
| I think the English lessons/classes offered by the University are already good enough.  There are no needs for extra lessons. | 6 | 10 | 16 |

Note: Our subjects are allowed to select multiple answers in responding to these questions. We only present the top 4 most chosen responses in our analysis.

*Difficulties in learning English faced by Japanese students*

We also probe into the difficulties in learning faced by Japanese students, and our findings are presented in Table 5. In terms of the difficulties faced by Japanese students, not surprisingly, "Listening and conversation" was the most common response amongst our subjects. At the same time, most students indicated their desire for the ability to communicate effectively with the native speakers, i.e., including being able to engage in basic conversations, as well as having the ability to understand and be understood amongst foreigners. Unfortunately, results indicated that students lacked the necessary language proficiency, as well as the self-confidence in doing so. According to Adachi (2009), "it is not so common for Japanese people to communicate in any foreign language on the street. Japanese students also seldom have any personal inter-cultural contacts with foreigners, except for their foreign teachers". Gudykunst (1998) further explains that the Japanese have a collective culture and use high-context communication, and they have a comparatively homogeneous community. That leads them to use Japanese style communication strategies most of the time, and results in difficulties for people from other cultures to understand (Knower, 2002). Another reason for their lack of self-confidence could be a result of lack of practice. Pease (2006) explains that students memorize English vocabulary, learn grammar, and translate passages from the textbook in much the same ways as ancient Latin text was studied. Chujo (2010, p. 21) also pointed out that "prior to students' entrance into a university, their previous 6 years of English education are focused on mastering grammar and vocabulary, because gaining a high score on the test is the focus on these abilities, and not acquiring conversational competence. The above situation has

brought about the consequence that English is being taught and learned as academic knowledge, not for the purpose of communication." As highlighted by Ohtaka (1996), English phonetic training is not actually practiced in the classrooms in Japan.

**Table 5.** Difficulties in learning English faced by Japanese students

| Response | Male | Female | Total |
|---|---|---|---|
| Which is/are the most difficult aspect(s) of the English language? | | | |
| Listening and conversation | 25 | 29 | 54 |
| Grammar and vocabulary | 14 | 28 | 42 |
| Writing | 15 | 14 | 29 |
| Which is/are the most important aspect(s) of the English language to you? | | | |
| I want the native speakers and other foreigners to understand me well, without causing confusions. | 19 | 34 | 53 |
| Basic pronunciation & correct accent is important, but the correct pronunciation is almost impossible. | 17 | 22 | 39 |
| Pronunciation and the correct accent are very important to me and I think I could achieve that by hard work. | 7 | 12 | 19 |
| What is/are most important English task(s) for you? | | | |
| Basic able to listen & understand English native speakers and other foreigners. | 21 | 30 | 51 |
| Basic conversations with English native speakers & other foreigners. | 17 | 32 | 49 |
| Being able to read newspapers & academic journals. | 17 | 20 | 37 |

Note: Our subjects are allowed to select multiple answers in responding to these questions. We only present the top 3 most chosen responses in our analysis.

*Students' desire in studying aboard*

Our results in Table 6 also reflect that for most students, studying abroad is not something they would likely consider in their near future. Only a very small number of the respondents, mostly male, indicated that they planned to go overseas for further studies. According to the Japan Times Weekly (2011), the number of Japanese students studying abroad has been falling mainly because they fear that

if they study abroad, they may lose the chance to find employment when they come back to Japan from their studies. It is because many enterprises stop accepting applications before students reach the fourth year of college. The results also indicated that in terms of planning to study overseas, male students seemed to outnumber their female counterparts. According to Nishio (2001), both Japanese male and female students were equally concerned about the lack of language proficiency, but female students tended to have more concerns than males, and could be related to indeterminateness. Further, Nishio (2001) pointed out that the issues concerning the female students, especially among single female students with financial support from their parents, were whether they would get married and their parents' continued well-being and happiness. In addition, the age concern also worsened their worries about whether they would find a job, and whether they would be able to have children later.

**Table 6.** Planning for continuing education in an English speaking country (n = 107)

| Response | Male | Female | Total |
|---|---|---|---|
| No, I don't. If I want to continue my education, it will be in Japan. | 18 | 42 | 60 |
| Yes, I have thought about it, but don't know exactly when. | 6 | 11 | 17 |
| I don't know. | 8 | 8 | 16 |
| Yes, I am planning to go very soon. | 4 | 0 | 4 |
| Yes, I plan to go in a few years. | 7 | 3 | 10 |

*Japanese students' anxiety in speaking English*

The results indicated that a majority (59.4%) of them, and mostly female, only got to speak English a few times a year. On the other hand, 26.1% of them said that they would only talk to Japanese speakers. Meanwhile, 9.9% of them said that when foreigners wanted to talk to them, they would pretend "not understanding English." The results also indicated that the female students apparently had more contacts with the native-English speakers in comparison to the male students. Not surprisingly, only a small number of them got to speak English on a weekly or daily basis. According to Nitta (2004), her description of Japanese young people attending a Japanese school stated that they study all subjects in Japanese with Japanese teachers dispatched by the Japanese government, speak Japanese at home with their parents, and socialize primarily with other Japanese outside of school. Such results further verify the notion that students' language deficiency and their lack of self-confidence were a result of a lack of practice (see Tables 3 and 7).

*Shyness and discomfort in speaking English in public places*

Not surprisingly, the results indicated that students in general felt uncomfortable, embarrassed and lacked the necessary self-confidence in speaking English in public places. A majority of them would simply walk away when they saw foreigners in public. Despite of that, a large number of them indicated

that they would still "give it a try to help," even though they did not feel so confident. Meanwhile, a small group of them indicated that would only speak English when they are not amongst Japanese friends. Three respondents indicated that they did not have the opportunity to speak English in public places (see Tables 3 and 8).

**Table 7.** Talking with native English speakers or foreigners outside of a classroom (N = 111)

| Response | Male | Female | Total |
|---|---|---|---|
| Yes, but a few times a year. | 3 | 63 | 66 (59.4%) |
| Never. I prefer to only talk to people who can speak Japanese. | 1 | 28 | 29 (26.1%) |
| Never. When native speakers or foreigners want to talk to me, I pretend that I do not understand English. | 8 | 3 | 11 (9.9%) |
| Yes, I talk to every week. | 3 | 1 | 4 (3.6%) |
| Yes, very often, almost on every day. | 1 | 0 | 1 (0.9%) |

Hayashi and Cherry (2004) also reported similar risk-avoidance tendency amongst the Japanese students. According to their explanation, Japanese students tend to show a more "authority-oriented" method of learning, and maybe because they are more familiar with this "traditional" style of learning. This kind of authority-oriented teacher influence on students can be attributed to the traditional teacher-student relationships in Confucian heritage, in which the teacher is considered the key source of knowledge. Thus, students strongly rely on the teacher's instructions and beliefs. In other words, instead of initiating their own learning activities, Japanese students would rather wait passively for the teacher to provide the answers. As explained by Hayashi and Cherry (2004, p. 90), "this may be explained in cultural terms as Japanese collectivism, or a general shyness and unwillingness among Japanese students to take risks. The reluctance to be more active, particularly during speaking activities, has been reported by researchers, and is clearly at odds with the communicative approach."

*Reasons behind students' anxiety when speaking English*

With reference to students' anxiety and embarrassment when facing English-speaking situations, the most common response was that they were "afraid to make mistakes in public when speaking English," "Japanese students do not want to make mistakes and cause confusions in public," and "in Japan, it is rude to leave someone in confusion and not be able to answer their questions." The second and the third most common responses were that students were "too shy to speak English" and they worry "that other English native speakers and foreigners will laugh at them" (see Table 9). According to Horwitz, Horwitz, and Cope (1986), speaking publicly in the target language is extremely "anxiety-provoking." McCoy (1979, p. 185) also mentioned that "students frequently enter the second language classroom with fears and anxieties." Horwitz, Horwitz, and Cope (1986) explained that anxious students tend to have fear

of making mistakes while speaking, and feel frustrated about their inability to present their ideas and express themselves in the target language. In addition to risk avoidance, Price (1991) also pointed out "their fear of being laughed at" or "making fools of themselves" being the major factors that made students anxious. Price (1991) also reported that students worry about their non-native accent and making pronunciation errors. According to Hayashi and Cherry (2004, p. 85), "making mistakes in front of others is considered to be especially embarrassing in Japanese culture and may at least partly account for this concern with accuracy." Both Horwitz, Horwitz, and Cope (1986) and Price (1991) reported that Japanese students in general tend to suffer from a high level of anxiety, as they first need to translate ideas and construct sentences in English within a limited time is a significant factor in inducing anxiety. Horwitz, Horwitz, and Cope (1986) further explained that foreign-language anxiety is closely associated with the inability to present one's idea and opinions, which can undermine self-esteem and threaten one's self-image. In addition, such inabilities to pronounce words correctly or use correct grammar can lead to negative evaluation by others, and the inability to comprehend spoken questions can lead to confusion and embarrassment about how to respond or act. According to Koba, Ogawa, and Wilkinson (2000), Japanese students tend to have anxiety about speaking in front of other students, and they are likely to be afraid of 'taking risks.'

**Table 8.** Have you ever spoken English at the public places? (N = 105)

| Response | Male | Female | Total |
|---|---|---|---|
| No. I'm not confident in speaking English at public places. When I see foreigners in public, I try to walk away. | 15 | 19 | 34 (32.4%) |
| Yes. Although I am not confident, I speak English to foreigners when they ask me for directions or other information. | 14 | 19 | 33 (31.3%) |
| No. I feel embarrassed to speak English at public places. I only speak English in public when I am not amongst Japanese friends. | 4 | 13 | 17 (16.2%) |
| Yes. I feel confident in talking English in public places. I only talk to foreigners when they come to talk to me first. | 7 | 7 | 14 (13.3%) |
| Yes, I feel confident talking English at public places. When I see a foreigner in public places, I go to them and ask if they need any help. | 2 | 2 | 4 (3.8%) |
| Others (Note 1) | 0 | 3 | 3 (2.9%) |

Note: (1) Examples of other responses: "No opportunity to do so"; "No, I haven't had such a chance"; and "I have never been to public places, where I must speak English".

**Table 9.** Why are so many Japanese university students afraid or become very nervous to speak English both in and outside of the classroom?

| Response | Male | Female | Total |
|---|---|---|---|
| Because for Japanese to say something to someone, they have to ensure that everything has to be correct, regardless it is English or Japanese. | 13 | 27 | 40 |
| Because they are too shy to speak English. | 13 | 18 | 31 |
| Because they worry that other English native speakers and foreigners will laugh at them. | 10 | 15 | 25 |

Note: Our subjects are allowed to select multiple answers in responding to these questions. We only present the top 3 most chosen responses in our analysis.

*Methods of self-learning preferred amongst the subjects*

When our subjects were asked what learning activities they undertook for improving their English skills on their own, a majority of them preferred a more passive and non-communicative style of learning, i.e., reading books and magazines in English. In contrast, out of all the 111 subjects, only 4 of them would choose to converse directly with native English-speaking foreigners for enhancing their oral skills (see Table 10). Koba, Ogawa, and Wilkinson (2000) also pointed out that English teaching in Japan still focuses on grammar and translation exercises, although there is an increasing demand to improve communicative competence. Given the historical and social contexts, if interactions are not fostered and encouraged within the classroom, it will rarely occur outside the classroom. Interestingly and contrary to their responses, when students were asked what could be done to help them overcome their fear to speak English, a reasonably large number of them suggested that the university should recruit more native English teachers to help students with their English individually or in small groups. In other words, although the Japanese students tend to shy away from English-speaking situations, many of them still recognize the importance and benefits of authentic language learning. Only via direct interactions with native speakers can students learn how to properly pronounce words and phrases in a natural way. In addition, students can receive instant and accurate feedback from native speakers to help them overcome various speech-pattern-related problems.

**Table 10.** Methods of self-learning preferred amongst the subjects

| Response | Male | Female | Total |
|---|---|---|---|
| What are you doing to improve your English skills? | | | |
| Read English books, newspapers & magazines. | 18 | 31 | 49 |
| Watching English movies OR TV programs. | 12 | 19 | 31 |
| Do nothing. I'm too lazy to learn English. | 8 | 16 | 24 |
| What do you think could help Japanese university students overcome their fear to speak English? | | | |
| Students should find their own ways to learn since everyone's learning style, pace & interests are different. | 10 | 21 | 31 |
| Japanese schools/university should hire more native English teachers to help students (one-to-one or small group) with their English skills. | 11 | 18 | 29 |
| Don't know and don't care. | 8 | 10 | 18 |

Note: Our subjects are allowed to select multiple answers in responding to these questions. We only present the top 3 most chosen responses in our analysis.

**Discussion**

According to McConnell (1999, p. 52), "the notion that virtually every student goes through 6 to 10 years of English instruction, but remains unable to converse with a native speaker, even in rudimentary terms, is now so much a part of Japanese perceptions of their own national character that one hears this lament time and time again from Japanese in all walks of life. Former Prime Minister Takeshita, a former English teacher, was especially fond of poking fun at the poor state of English education in Japan, often at his own expense." This reconciles with our findings that students felt nervous and embarrassed when they had to speak English in public places, as they worried about making mistakes in the presence of others. In addition to their fear of being ridiculed, Japanese people often face difficulties in expressing their opinions. Such general shyness and unwillingness to take risks may be the results of the students' own socio-cultural backgrounds. In fact, many researchers pointed out that Japanese people in general are not used to people or things that are different from the homogenous Japanese norm. Japanese people are also not comfortable with uncertainty. As explained by Aiga (1990), expressing one's opinions or ideas or participating in group discussions is not common in Japan. It is believed that this is closely related to the Japanese culture, where it is not the custom to express one's opinion. For example, the old Japanese proverb says "go along with others," and they are especially reluctant to express their opinion to someone of higher status such as their teachers. Based on Hayashi (1997), when Japanese students were asked what made a good student, they responded that good students do not interrupt the procedure of the

class and should be quiet. Kindaichi (1978) also reported similar findings, i.e., Japan's linguistic homogeneity, and group-oriented culture could make foreign language learning difficulties. Japanese people are reluctant to offer opinions, debate, stand out for either making a mistake or being more capable than their peers, even in their mother tongue.[1]

With reference to their language-learning environment, access to proficient English users outside university is often found difficult. Many did not have an opportunity to study or to use English outside the classroom environment, as most of these Japanese students are living in an entirely Japanese-speaking context, and they rarely get to meet English speakers on a daily basis (see Tables 3 and 7). Many researchers also commented that the homogeneous, monolingual society of Japan is not a favorable environment for learning English. This can be expected to impact significantly on students' overall motivation and attitude. Furthermore, for many years, Japan has been linguistically and culturally self-sufficient.  For example, Japan has been able to export many cultural products, such as Japanese pop music, films, television dramas, comic books, and animated films. Owing to these reasons, in so far that one lives in Japan, there is no urgent necessity to speak any language other than Japanese for social or communication purposes.

With reference to the regular learning mode amongst the Japanese students, Seki (2004) explained that the teaching of more communication skills, such as speaking and listening, and more student-oriented learning, such as group study and creative work is indeed very rare in Japan.  In addition, a majority of the English teachers are Japanese. Though this varies with universities, smaller and more communicative classes (usually taught by native English speakers) are usually optional and accept only limited numbers of students. Furthermore, Japanese teachers of English also tend to teach English based on the Japanese communication patterns. Consequently, Japanese students tend to speak and understand English based on such Japanese communication patterns, i.e., including their different choice of vocabularies, sentence structures, pronunciation, etc. All of these cause difficulties for the Japanese people to communicate with any non-Japanese speakers. As the survey results indicated that the biggest problems with English for these Japanese students are listening and conversation, followed by grammar and vocabulary (see Table 5). The Japanese language has no close relations to most other languages, including English. As Pease (2006, p. 54) pointed out, "English language students in Japan do not develop listening and speaking skills, because they are not exposed to native English speakers or they are taught by Japanese English teachers who can teach vocabulary and grammar without adequate English speaking skills. The lack of these skills negatively influences the students' ability to pronounce English words correctly." Mendelsohn (1995) further explained that the first reason why listening is often poorly taught

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[1] On one occasion (in May, 2012), one of the co-authors asked a female Junior student why Japanese students are so reluctant to speak out in class, and she gave the following explanation in her own words:

> First, Japanese tend to reserve from stating their opinion until they think that they understand 100%. We tend to aim to be perfect in public (I mean, in front of another person). So, if foreigners speak to us in English, most of the time we would remain silent because we are left in confusion. Secondly, we are raised with telling, "You shouldn't do things that spoil the harmony among the members" or "Stand out from the crowd and you just invite trouble for yourself." So most Japanese dislike to standout. That's why they don't tell voluntarily. Thirdly, people tend to extremely dislike being humiliated (we think making mistakes in front of another person is typical of that) in the cultural climate of Japan. We become extremely frightened because of that fear. Fourthly, I'm in this case, they might have small vocabulary or cannot find relevant words to express something they want to say, and we are left in confusion. As stated above, we tend to aim at perfection. So we become very nervous because we think of ourselves as imperfect.

is that traditional second / foreign language listening materials are often not suitable for instructing students to listen in the real world. The content is often thoroughly inappropriate, boring, irrelevant, or downright patronizing.

For most Japanese students, the ability to understand spoken English and to speak with correct pronunciation is a slow process, and would evolve with much and constant exposure immersion and involvement of any second-language learners. So they perceive using English be an intimidating experience, with discomfort, high anxiety, low confidence, embarrassment, as well as a lack of initiatives for direct oral communications with foreigners. In addition, self-confidence is related to self-esteem, self-efficacy, and even anxiety. Parallel to Pease (2006)'s findings, students are reluctant to do so, because of their fear and a lack of self-confidence in their English-speaking abilities. Students who have a low degree of self-confidence are easily threatened by any difficult tasks. In addition, their fear of negative reactions, loss of face, and feelings of incompetence and helplessness amongst their peers are the other compelling reasons for the students to remain silent or to shy away from English-speaking situations.

**Conclusion**

The Japanese student participants in this study exhibited a range of attitudes towards learning English. Understanding their motivation, attitudes and contributing factors is particularly important to teachers, as it enables them to understand better and meet learners' specific needs. According to Aline (1999), the English taught at the Japanese universities is almost entirely reading and translating, and the students were seldom given the opportunities for oral communication. Furthermore, most of the instructions concentrate merely on the explanations of grammatical rules, with almost no opportunity for practicing the actual use of the English language in meaningful contexts. Consequently, students became very passive in learning and also perceive it as individual work, resulting in students' language skills are more academic than communicative. This might explain why students' responses indicated a weak willingness to communicate in English in 'real situations,' and basic spoken English still remains difficult for them even in their senior year.

The results suggested that a majority of these Japanese students have little exposure to English in their daily life. The fact that Japan is a firmly monolingual society and language learning via direct interaction with native speakers outside the classroom could be an unaccustomed and intimidating task. Such "unusual reactions" amongst the Japanese people are often beyond the understanding of many foreigners. Both the unique Japanese language and culture have further complicated the understanding of spoken English for the Japanese people.

In this questionnaire survey, despite having low English proficiency, students in general still recognized the importance of acquiring the language for their future. Only a small number of the participants expressed having negative attitudes towards (i.e., hate or dislike) using English outside the classroom environment. Implications for the students are that they seriously need to increase their contacts with both the English language and especially with native speakers outside the classroom, because the English language is an essential tool to communicate with other people around the world and obtain information over the Internet. Avoiding English entirely is not a realistic option for Japanese students, because English language competency is essential for them, as both the economic globalization

and international trade will no doubt continue to expand. Such fearful attitudes on speaking English amongst the Japanese students need to be changed.

It should be highlighted that the findings of this study cannot be generalized to all Japanese university students yet. Further and continuous research on Japanese university students' attitudes and motivation is recommended because they will be changing along with both the Japanese society and culture. It is hoped that the present study will add to the recent efforts to broaden the research agendas relating to the attitudes and motivation towards English learning amongst Japanese university students, as well as the reformation of English curricula in Japan. We are also of the view that the result of this study can provide insights to other researchers to build upon their research by probing into the learning issues of non-native English speaker in learning in an English medium.

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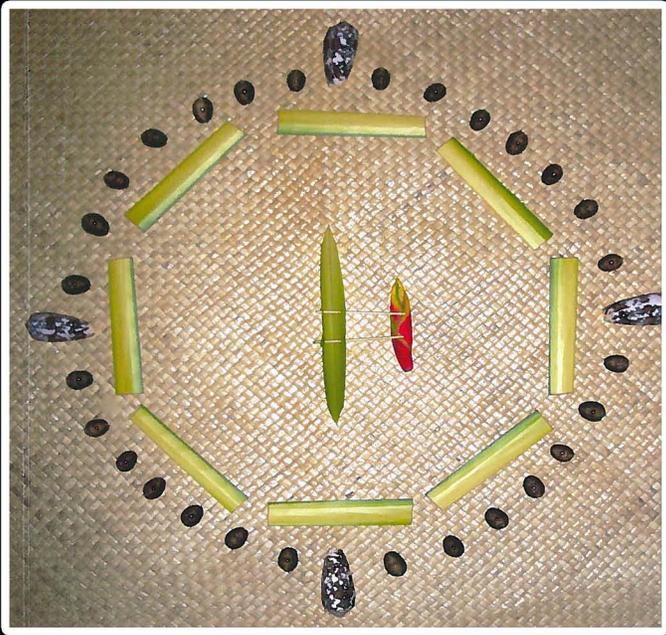
Heiwa: Heiwa is the pushing of the canoe on the unfolded mat to demonstrate how a canoe will actually sail in the ocean from the departure island to the destination island. The navigator uses one or more stars or constellations and uses the faunan etak (primary reference island) and possibly a fauan yatil (secondary reference island) in tracking the course. Heiwa is also used to explain the feeling of the canoe's movement caused by the waves and swells hitting the canoe.

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