USE AND AVAILABILITY OF INSTRUCTIONAL TECHNOLOGY FOR SCHOOLS ON GUAM

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Abstract

Abstract

When considering schools on Guam, there are many options - both public and private – on the United States Territory Island. The variety of educational K-12 options include various curriculum choices and resources. Similarities and gaps in these resources have not been explored. This study sought to investigate the use and availability of instructional technologies at a cross section of some of the schools and districts that were willing to share with the researcher. The data gathered reveals similar technologies available to students and teachers, and reveals opportunities for discussion on collaboration. The results of this study reveal possible gaps in teacher preparation as it pertains to instructional technology preparation and training. The data collected in this study can inform future teachers on Guam as to what is currently in use in various schools and help focus teacher preparation skillsets with instructional technologies.

In this age of technology, the use and application of information technology is being incorporated into every nerve of the world's economy. In a short while, it will be impossible to survive for those considered to be illiterate in matters IT. From this information revolution have emerged two new terms; instructional technology and educational technology. It is common theory to consider these two terms to be synonymous. However, there is a difference. According to the Association of Educational Communications and Technology, "Instructional Technology is the theory and practice of design, development, utilization, management, and evaluation of processes and resources for learning (Seels & Richey, 1994)." "Educational technology is the study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technology processes and resources (Januszewski & Molenda, 2008)."

Development of such ideas is evidence that the impact of technology has found its way well into the teaching and learning processes. Instructional and educational technology is paving way for the future of education. We are currently in a digital age and the future shows prospects for more advanced technology than we have already seen (Smith, 2014). It is therefore necessary that schools prepare students who can adapt to the future technology, and one way to do that is to embrace the current use of technology in schools.

To fully realize the benefits of technology in our education system and provide authentic learning experiences, educators need to be properly prepared to use technology effectively in their practice Office of Technology Education, 2017). The Internet is connecting students and teachers across the globe. They can share information, curriculum and develop global learning communities. Digital gadgets are providing a problem-based learning environment that sharpens the students' skills through active learning. Moreover, these devices appeal to and activate the senses and thus provide individuals to develop their intellectual and creative abilities. Despite

these advantages, some drawbacks come along. Moral concerns surrounding the internet are a hot debate. Another boiling issue is the safety of student's sensitive data. There is doubt about just how safe students' data can be and who will have control over it access and manipulation (Nagel, 2013). How to effectively apply these technologies and whether they positively impact performance coupled with the challenge of online curriculum are some more challenges. The following is a report on the survey of use and availability of instructional technology in Guam K-12 schools.

The Problem

Borrowing from the increasing focus on use of instructional technology in schools, the purpose of this study was to establish the extent of the use of this kind of technology in Guam K-12 schools. More than that, it seeks to understand the availability of such kind of technology to the area. It surveys what kinds of technologies are available and how widespread is their use. The aim of data assembled form here is to assist the next generation of teachers in this island of Guam. It should give an understanding of the status of technology in this area and the potential available. Moreover, it will equip them to face the challenges revealed so they can handle them better and device solutions for their time.

This is an age of computing and technology and the education sector has realized it cannot lag. It must keep up with the pace because the unforgiving technology will spare no sector its influence for good or bad. Conscious efforts are underway therefore, to harness the good will of technology for improved teaching-learning experiences. Just how far is this technological advancement in Guam? What are its impacts and what are the ensuing challenges for preparing future teachers?

Research questions

The information gathered in this study was precured through interviews with directors of technology and technology leads at various schools. For this study, the following research questions were put forward to participating parties to lead the discussion;

1.   Are there any iPads utilized in the schools?

2.   Are there any Chromebooks and or android tablets utilized in the schools?

3.   Are there any Computer labs? If there are any, how many are labs and computers? Do they use Mac, Windows operating systems or both?

4.   Is the staff provided with computers? I f so, what computers are available to faculty, is it laptops or desktops?

5.   Are there any 1-1 classrooms?

6.   How many websites and or Apps and which one in particular does the district and/or schools have licenses for (brianpop, edutopia.....)?

7.   What kind of Learning Management systems (LMS) are used? Do you have Blackboards, Moodle, Canvas, etc.?

8.   Do you operate on E-binder or portfolio utilization (for example livetext, livebinder, TK20 etc.?

9.   Do you have assistive technologies? If so, what kind do you have?

10.   Do you offer Online - distance learning and is blended learning utilized, for example Google Classroom?

11.   Does the school utilize interactive white boards like Promethean or Smartboard brands? If so, how many are available to teachers' K-12?

12.   Are there plans and budgetary adjustments to acquire more boards?

13.   Anything else you think may be applicable?

Procedure

The study was conducted through interviews. The above questions were organized into an interview which was then administered to different school management. The schools involved include; the department of defense federal schools in Guam, Guam public schools, two charter schools and two private schools.

Results

From Department of Defense Federal School;

1. About interactive whiteboards, we have interactive whiteboards in every classroom in our schools K-12. The brand in use is Smartboard and we have a dedicated trainer/support person.

2. We have a pilot iPad program for our sped department in each school. However, we are facing problems with connectivity and using it to full potential because our network is secured and on backbone of .mil for DOD so our options are very limited. We are limited to the type of apps and cloud services we can use.

3. We have no chrome books. We are using desktops and laptops with restrictive operating system. They are also standardized across the department of defense.

4. We ran a 1-1 laptop initiative at our high school for the last four years with success. They are out of warranty now so we are back to labs there and in all our other schools. As a rule of thumb, we have a two to one ratio for computers and are on a five-year refresh cycle to keep our equipment up to date.

5. About websites, new cloud restrictions cut us from hundreds of different sites. We are only allowed subscriptions to only those vetted by headquarters and run through the department

of defense security systems. That means we have about thirty only. PII requirements and third-party hosts access to our sensitive military data are the cause for limitations.

6. We recently adopted Schoology as our Learning Management System throughout our area of influence and it has proven to give us all the functionality we needed for our use.

7. We have nothing notable with e-portfolios.

8. We have good funding for our SPED population and have an extensive assistive technology library with generous staffing for our special needs population.

9. As a system we host an accredited online virtual school for distance learning courses that meet high school graduation requirements and offer kids in remote locations an opportunity to take courses not offered at their schools. This includes not only mainstream courses for remediation but also a variety of advance placement classes that may not be available to small schools with limited staffing.

From the Guam Public Schools:

1. There are approximately 300 Promethean boards in the district. The Enhancing Education through Technology Project has 200 of those distributed by school. Some are purchased from the local budget and the rest are Title V-A Funded.EETT has requested approval the 2016 Consolidated Grant Application to purchase 8 more boards. Career Pathways that works with our GCC programs at George Washington plans to purchase 12 more. There are plans to purchase portable, back-lit Promethean boards in the near future for all schools.

2. Yes, there are iPads used. Striving Readers is a discretionary Grant that has provided iPads to teachers in their program. I will be piloting iPads for Kindergarten in the next application with 7 K classes at Finegayan. Librarians have used some of their funding to purchase some as well.

3. We have been only using personal computers. The next purchase for student use will be hybrid laptops. We have not used chrome books before.

4. Most of the schools abandoned the computer lab model as the technology is best when integrated with the instruction. However, there was a request for a few schools to go back to a dedicated computer lab. These labs are approved in the present grant application. They will be outfitted with a mobile cart that houses 30 hybrid laptops, a projector and document camera. 7 schools will have the newly equipped labs. Not sure how many of our other schools have a lab as a dedicated room.

5. We purchased using ARRA funds during my first year here, 1700 laptops for teachers. Not all teachers availed of the program. Teachers still may sign-out a laptop. Those 1700 laptops are recycled to new teachers if turned in by a teacher leaving the district or a contract teacher. Some teachers had some desktops in classes for student use. Prior to the laptop project, teachers would not be provided a laptop when they are hired. They would need to provide their own.

6. I hear of teachers that are having students use personal devices. As concerning a formal 1:1 program, we are not yet there. The new application as I mentioned above will provide a 1:1 all day for the kindergarteners at Finegayan but they will not be taking the iPads home.

7. I believe there is Brainpop. Khan Academy is popular and free. Curriculum and Instruction does purchasing of licenses and subscriptions with their funds. I am not sure what programs for sure.

8. We do not use a Learning Management System. However, we would love to have one especially for single-sign on for our teachers using multiple accounts/dashboards.

9. I am familiar with some schools using Livebinder. I have not heard of any others being used.

10. Absolutely. We have two team leads who oversee our assistive technology specialists in Special Education.

11. Several teachers use Google Classroom and several more are beginning after a conference in August where it was presented. We offer training for the district's student management system on-line for new teachers or those in need of a 'refresher' course. We will offer online courses in connected educator. In the next application, there will be bundles of on-line courses related to connected educators which will be 7 online courses teachers may take related to integration of technology in schools.

Moreover, we provide all our teachers with email. Student emails to conduct Google Classroom is just beginning. I was not comfortable with students using private email accounts. Our technical office creates a bank of emails for a teacher if they want the students to have email but in that case, the teacher manages the email account including passwords and password resets. 30,000 emails was a lot for us to just start providing to students.

From the Charter School 1:

1. We have no interactive whiteboards.

2. There are no chromebooks in our school.

3. Yes, there is an iPad for every student. It is part of the curriculum and is integrated with McGraw-Hill applications.

4. There are no computer labs.

5. Faculty receive a Macintosh laptop computer.

6. We do not use a learning management system.

7. There are no electronic binders utilized.

8. We use the McGraw-Hill online apps and website.

9. There are no assistive technologies used at this time.

10. There is no Google classroom or other online learning used.

From the Charter School 2:

1. We have one interactive whiteboard. It is not working and I am unsure of the brand.

2. We have 75 Chromebooks shared throughout the school.

3. We have 75 iPads shared throughout the school.

4. There are no computer labs.

5. Faculty currently supply their own computer and they receive an iPad.

6. We do not use a learning management system.

7. There are no electronic binders utilized.

8. We use the McGraw-Hill curriculum website.

9. There are no assistive technologies used now.

10. There is no Google classroom or other online learning used.

From private school 1:

1. We have 44 iPads

2. We have 40 Chromebooks

3. We have a Lower Computer classroom with 16 iMacs and a classroom with 12 PCs.
Neither is being used primarily for scheduled "lab" use, but rather as classrooms.

4. We have around 60 faculty members; each has an iMac. The total number of iMacs on
campus is around 150.

5. We do not have 1:1 classrooms. We have carts of 12 MacBook Pros for MS, 10 iPads for MS, 16 iPads for LS, 16 Chromebooks for LS and 16 Chromebooks for MS that we use for 1:1 environments. The Upper School operates under the Buy Your Own Device policy.

6. We are not sure what to indicate for this one. We have some online textbooks that we are using and dozens of iPad apps as well. It varies greatly from room to room.

7. We are a Google Apps for Education school. The Lower School uses Renaissance Learning for online reading assessments and some math classrooms use ALEKS.

8. Not formally. I've been pushing for a portfolio program using Google Drive.

9. We have no assistive technology applied across our entire campus; the closest we have come would be in our ESL classrooms.

10. We use Google Classroom mostly. Some teachers use wikis or classroom websites.

11. Yes, we do use interactive whiteboards. We have 2 Promethean boards and several Mimio systems.

12. We have plans to acquire more boards but it is not possible without grant assistance

13. My inventory sheet has approximately 480 technology items listed on it. Of that, 214 have been acquired through the Federal ARRA grants. Needless to say, the Federal assistance has been a tremendous help to modernizing Guam's public and private schools. I've conducted training sessions for department of education teachers starting in 2011. I'm not sure what the current situation is like in the public schools, but I hope the grant equipment is being managed and used efficiently. The teachers need meaningful professional development more than they need equipment.

From the Private School 2:

1. We do not have any interactive whiteboards.

2. We do not use chromebooks

3. Students can bring in their iPads or other devices with parent/teacher permission.

4. We have one computer lab.

5. Faculty currently receive a windows laptop.

6. We do not use a learning management system.

7. There are no electronic binders utilized.

8. Some teachers use online learning sites but I do not have all the data for use.

9. There are no assistive technologies used now.

10. There is no Google classroom or other online learning used.

Discussion

The survey reveals that a few of the instructional technologies are available and are used both in private and public schools in Guam. The following section discusses these technologies.

1.   Interactive whiteboards

Interactive whiteboards are available in Guam schools. They provide for interactive learning. Users can control objects on the screen through a touch sensitive interface. They are advantageous in that they provide an opportunity to open all necessary resources needed for a particular lesson. The teachers can also input their lesson plans into the boards and find ready-made lesson online. Moreover, students with digital gadgets like iPads can access the boards remotely. In total, they provide an unforgettable learning experience by arousing the students' interest and mostly importantly changing their attitude. The Department of Defense Schools use the Smartboard brand while The Guam Public Schools use the Promethean brand. The federal school's boards are supplied through the federal government while the Guam Public Schools use

a local provider who installs, supports and warrantees them. There is no local provider for

Smartboard brand.

2.   iPads

IPads are slate computers that are quite portable and can even be handheld when using. In

Guam, they are used very sparingly in the public and private schools. One charter school utilizes

the iPad for every student.

3.   1-to-1 computing

1-to-1 computing is an initiative to provide each student with their own digital device for

learning. The push factor behind this idea is the need to have standardized online texts for

students. Students cannot share devices because of that reason. Initially, laptops were preferred

for the implementation of 1-to-1 initiative, but with the advent of newer devices, the preference

has changed a lot. Now Chromebooks and iPads are the devices of choice for some schools. In

Guam, Chromebooks are yet to make an impact in the area because they are a relatively new

concept. They are only available in one private school and one charter school.

The 1-to-1 initiative however, has faced a myriad of challenges in Guam. The federal

defense school for instance started a pilot project with laptops in their high school for four years,

but eventually it failed due to warranty issues. Now they resorted back to computer labs. The

major challenge with the initiative is acquisition of the gadgets and equipment necessary and

maintaining it. Another challenge is unavailability of sufficient bandwidth to accommodate all

students for internet access at the same time.

4.   Online and long-distance learning

Online learning refers to the use of online tools for academic purposes. It encapsulates e-

learning as well. Distance learning was created to allow student from any part of the world to

enroll in an institution of their choice if they meet entry requirements. That way, a student can enroll in a college in another continent for instance without having to physically travel to the college. A combination of distance learning and on-site learning gave birth to the form of learning known as blended learning.

In Guam schools these facilities are sparingly established. Of the interviewed schools, the Department of Defense school has an option for distance learning for subjects not available locally. This subject is an issue under great debate and scrutiny the world over. There are concerns raised about its credibility even with more and more people enrolling in online courses. Many stakeholders are in doubt of its accountability, while on the other end some states have made it a law for students to undertake an online course before they can graduate.

Its impact on learning, however, cannot be pushed aside. Students in remote areas are now able to access course and teachers from other areas without having to incur travel expenses. They get to do courses that eve n their own institutions where they are enrolled do not offer. In public schools in Guam, this facility has been extended to teachers as well. New teachers can enroll for the online courses. Even those who are not new can still do refresher courses on the online platform.

5.   Websites and online resources

As the schools shift into the digital platform, they will require online curriculum and materials to replace the traditional hard copy ones. There is a great challenge in this part of the system. Restrictions and subscription requirements are limiting the amount of content available for teachers and students. Some free online instruction references and curriculum is available but it is a hectic task to dig into all of it to find suitable material. For this reason, the establishment of strong digital systems has become a challenge.

6. Assistive Technologies

Assistive technologies are available with the Department of Defense Schools and the Guam Public Schools. These services are not widely available at the charter and public schools.

7. Computer for Faculty

All schools except for one supplied faculty with laptop computers for their jobs.

8. E-Portfolios and Online Classrooms

Only one private school utilizes E-Portfolios and online classrooms now.

9. Chromebooks

Only one private school and one charter school uses chromebooks at this time. It is being considered in the Guam Public Schools.

Recommendations

- For the teacher preparation, it appears that training on Promethean boards will be beneficial. Most of the teachers graduating from the University of Guam will be teaching in the Guam Public Schools. With over 300 boards and plan to acquire more, training on this technology would best prepare them for their jobs.

- The Guam Public Schools are looking to possibly implement Google Classroom and Gmail into the school. Training for future teachers on this platform will be beneficial.

- There is need to establish enough bandwidth to support digital academics. This topic was discussed with many of the technology directors as to the ability to get all students online in their schools. Wi-fi networks would need to be updated and improved in many cases.

- More funding should be ploughed into this project for acquisition of equipment and maintenance. Considering the different socio-economic conditions of students, it will be wise for the institutions to be able to purchase and warrant devices for their students. The bring your own device option may be applied for secondary institutions providing a secure network is available.

- Attention should be given to the 1-to-1 initiative. It has potential to transform learning for students and families who lack the resources outside of the school.

- All stakeholders should come together to develop a comprehensive curriculum for all the schools in their area. Moreover, they should organize online material and references into a pool of credible sources for easy access and sharing. This digital content can then be made available to all schools to overcome the policies that restrict access to it.

Conclusion

Several instructional technologies as presented above are available in Guam. Many of them are not fully established but they have found place in some schools and are being used adequately. It shows an incredible acceptance of these technologies in the area, right from interactive whiteboards all the way to digital gadgets. Some of them, however, like the use of e-portfolios is yet to be recognized and formally implemented. For such technologies, there is hope in the few teachers who are pioneering them despite them not having received formal approval. It is just a matter of time before they get accepted everywhere in the area.

With such funding as shown from the interview result, the use of instructional technologies is expected to grow soon. It is a challenge, therefore, to incoming teachers to be proactive and join the bandwagon. They are the future of these efforts started and they will

determine their success. Knowledge from this paper should be used to equip these new teachers

for the task ahead of them. This paper can may also be revisited in the future for updates on

available technologies on Guam.

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