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Multiple Approaches to Technology Integration into Education

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ABSTRACT

Many efforts for tech integration in education have failed. Our assumption is not valid to expect that students learn how to use technologies and media by their own. Our school system has to figure out how to make technology integration happen. This paper explores the possibilities of integration of technologies from basic to sophisticated methods from consumption to production into education.

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INTRODUCTION

Many efforts for tech integration in education have failed. Our assumption is not valid to expect that students learn how to use technologies and media by their own. Our school system has to figure out how to make technology integration happen. This paper explores the possibilities of integration of technologies from basic to sophisticated method from consumption to production into education.

Technology should be integrated into education to improve students' skills at school time and business (Hafkin and Taggart, 2001). Technology promotes new and better business, economical, political, and communication processes (Hoffman and Novak 1998). The weak attitude of students towards technology will lead rare exploration technology in all these aspects. School administrations try to understand how they can support youth in learning to use digital media.

The uneven distribution of technologies across the world is called the digital divide (Hafkin and Taggart, 2001). Digital divide between the information have and have nots exists in racial, gender, income groups and nations. Technology users in most schools are not representative of people in the country as a whole but rather are part of elite group (Hafkin and Taggart 2001). The goal of the paper is to enhance the quality of education by using the technology opportunities. Whether or not students learn subjects is a core issue of quality of education.

School administrations, teachers and students need to embrace technology to reduce digital divide. The use of new technology is crucial in schools to alleviate the learning problems and to increase the performance. The technology offers an opportunity to increase production given capital and labor inputs (Feder et al. 1985). What steps that schools should follow is the goal of the paper.

The U.S. Department of Education (2013) lists four goals related to technology literacy

- "All teachers in the nation will have the training and support they need to help students learn using computers and the information superhighway."
- "All teachers and students will have modern multimedia computers in their classrooms."
- "Every classroom will be connected to the information superhighway."
- "Effective software and on-line learning resources will be an integral part of every school's curriculum." (www.ncrel.org).

Probably the most important thing for our education system is to embrace change. How do we attract children' curiosity? (Brown, 2012). The technology may help students to be engaged.

Teachers don't connect every child due to layout of the classroom. The idea that children learn best by sitting in uniform rows facing the front of the room is ineffective. What new structures could we design that might be better (Thornburg, 2012)? Our paper focus is the role that technology may play to get in touch with students of students learning. What might be some methodologies of integration

technology and education? Students can leverage educational technologies to make a very significant impact in the classroom instruction.

The authors of this paper believe that every single student, when given the chance, wants to learn and embrace the technology. We try to show technology integration methods from easy to advanced ones. The technology applications show that students turn around from failure to success stories.

The world has changed and teaching cannot stay stagnant. Teachers recognize the fact that they cannot teach the same way that they are taught in the past.

In the second section, we explore theoretical aspect and in the third section, we present several case studies to present technology integration and conclusion will be followed.

2. Theoretical Aspects Application of Technology in Education

In technology integration there are four main applications: basic-consumption, advanced-consumption, basic-production and advanced-production.

Table 1. Application of Technology in Education

	Basic	Advanced
Consumption	Daily interaction	Assignment presentation
Production	Tech class basic	Animation class

In the consumption, technology is already created outside of the class, students and teachers take advantages (table 1). In the basic consumption, students are encouraged to use daily task. In this category most of the examples are related to social medias, open source programs and emails. Some teachers find that students themselves are often on social media. Instead of looking at social media as a distraction, teachers would rather use it to engage them. In the advanced consumption, students perform their assignment through technology. Doing assignments and presentations by using google docs, power points, iMovie, and a poster are further steps from basic consumption. Teachers may apply the available technology into education.

Producing technology is certainly tougher than consuming one. Here, it needs special technology lectures. Teachers start showing how to write basic and advanced coding and how to shoot a movie. An example of production is video shooting in under 90 seconds to present a life story with pictures from their childhood, to create a tutorial explaining a concept that they learn, and other fictional story that they write. Students are not anymore passive consumers by playing games but they produce games or convert game elements into education purposes.

SECTION 3. CASE STUDIES

3.1. Consumption

3.1.1. Basic Consumption

Table 2. Using open source and free source

Concept	Process	Result
Open and free source	Spreading softwares in classes.	Alleviating the resource constraint.
360 degree technology	Penetrate the technology in every part of education	Students engage technology.
Accesability	Teachers are each provided a cell phone from the school in order to make themselves accessible to students twenty-four hours a day, seven days a week.	Teachers are building this positive relationship with students Availability outside of the regular class hours regarding homeworks and personal problems. High energy and high impact

Open and free source applications spread out (table 2). Anybody who has a computer or internet, they can access the free web apps or cloud-based. Students continue to learn in any place. They can do their digital art in programs such as Sumo Paint, Psycho Paint, Google Docs, Google Drawing, PhotoSketch, iLife, iMovie, iPhoto and SketchUp. They can save their files into cloud companies such as Google Drive or Dropbox. They can call each other through Skype or Google Hangout. Teachers take advantage of free software and open source. Garage Band and iTunes are used for audio

recordings or create music. The technology skills collaborating with writing, reading and speaking skills.

One of the most advanced technological integration happens in Singapore (Kao, 2011). They develop the concept of **360 Degree Technology** in Schools. In Singapore, the education system embraces technology to make learning more engaging. Teachers produce teaching materials and teaching ideas to engage the students in technology in the classrooms. Teachers want students to Tweet them answer. In a traditioanal classroom, it is really impossible to get all students to answer all questions at one time. When students and teachers use the instant messaging tool, they could answer all questions at the same time. Teachers can analyze how and what students think. The technology helps educators to benefit construtivist education methodolgy where students learn each other in the social networks to promote very participatory culture. It is a collaboration. In this collaboration process, they no longer become just a consumer of knowledge but they produce knowledge (OECD, 2010 and Pearson, 2010). In 2009, the first year Singapore participated in the Programme for International Student Assessment (PISA) tests, its students placed near the top for all tested subjects.

Technology application is not suffucient to explain the success of Singapore. Teaching is a highly respected and well-compensated profession in Singapore. All teachers are trained at the country's National Institute of Education. All new teachers are paired with experienced teachers for mentoring, and peer feedback is built into the schedule. Teachers are entitled to 100 hours of professional development each year.

Accesability through cell phone and email enpowers the bilateral relationship. Teachers are building this positive relationship with students not only the school day but also at night The idea being is that students aren't allowed to use the excuse that they didn't understand something. The full-time accessibility allows students reach teachers at any moment. It passes the normal school hours. Teachers are available to their students outside of those hours.

3.1.2. Advanced Consumption

Table 3. Advanced Consumption

Concepts	Process	Results
Digital presentation and online assignments	-Make all assignments with technology	-Students learn how to use technology
Differentiated Instruction by Online	-An educational website helps students work through interactive challenges at their own pace, while teachers have access to interactive dashboards to monitor and assess student progress.	-The average score is up 40 percentage -Students are engaged. -Kids are repeatedly trying. -Their learning habits are changing.
Universities	-All the materials are prepared by Universities: kits, the teacher's guide and lesson plans, the curriculum handbooks, the site plans, are delivered to the teacher. Students are broken into teams and assigned students serve in a specific role, like site planner and director of marketing.	-Students practically understand the fundamental concepts of their materials rather than memorizing facts and stuff. -Students become experts in their individual roles, a deeper understanding, can better interpret questions, build up useful skills, and share their ideas with the group
NASA	NASA Explorer School which provides educators of grades 4-12 access to NASA's people, missions, research and facilities through a comprehensive set of NASA's classroom materials to teach science, technology, engineering and mathematics	There is a library linking to NASA's innovative research and scientific discoveries. NASA professionals support teachers to implement NASA materials into classrooms. Live video chats are able for students to ask real-world missions, projects, and career-related questions to NASA experts.
Long Distance Education	Students and teachers meet on line	Opportunities all students

Assignment presentation is a project-based learning activity to have the students teach one another the key concepts (table 3). Students learn the material best when a student has to present and teach it to another person. Students are really engaged when technology is involved. In their presentation, they are using Google Presentations, Google Docs, Power Points and iMovie. For example, in iMovie, they put the video and mixed it with the audio and they cut off some portions of audio or clipped some portions of video for it to match up.

In differentiated instruction, the goal is to find out where each student is and then devise an individual learning strategy that will help them get to the next level. At the beginning of the year, a variety of assessments is realized (math and literacy testings) to assess the level of students of literacy and mathematical strengths. It breaks down for each child to let us know what range they're in and how we can better group them, or how we could better teach them within those groups.

There's not a school in the world where everyone is exactly the same. Teachers have to make sure that they know where children are. Teachers don't take time students to teach materials that they already know.

The expansion of computers help individualize the study of math, science, language arts and social studies. A model for teaching is individualized, personalized, authentic and collaborative learning. It's personalized, in that everybody's showing their learning in a way that is comfortable to them. An example of differentiated education, Khan Academy is an educational website featuring over three thousand videos in many core academic subjects (www.khanacademy.org). Students work through interactive challenges at their own pace, while teachers have access to interactive dashboards to monitor and assess student progress. Online resources help teachers to prepare class lessons and to analyze how many exercises students have completed and where they struggle. Students start solving these exercises multiple times. Students are trying and eventually they learn the materials. Hence, students' self-confidence is increased and they are more engaged.

Historically, it is really hard to get the kids engaged. It was easy for them to sort Well, now they have to keep moving because they know we're keeping track of the problems they're finishing and they want to see the progress bar move; they want to see themselves become proficient in the exercises.

An example of the contribution of universities to public school is the **Urban Plan Program**, designed by the University of California-Berkeley. Urban Plan is a fictional place, but many regions face similar problems. Students are presenting solutions for cities. Urban Plan Project consists of software analysis and lego materials to design a city. Students use legos to create a model of their new neighborhood. The computers are loaded with the sophisticated software they need to solve complex problems (Bernard, 2008).

Economics and politics classes move out of their silos (Bernard, 2008). The project teaches economics issues: marginal-cost benefit, allocation of goods and services, and role of incentives such as placing parks versus skyscrapers. A city planner can't be totally free and creative because there are public rules on building heights and appearances. The project prepares students ready for the real world.

To make assignments easy for teachers, the Land Institute in University of California provides equipments (laptop, legos and software) and human resources (volunteer developers) to the teachers for the project.

This type of project opens new dimensions for students. They are working with different people, dealing with problems, negotiating with interest groups, speaking in front of strangers, thinking about design, making decisions and working with numbers.

In the second phase of the Urban Plan, real estate professionals who serve as facilitators come to class to discuss the initial designs and sometimes they ask tough questions; e.g. about homeless shelters.

This project incorporates so many different subject areas. Students learn to use science, technology, math, art, research, and speech in the final presentation.

Another example is the **NASA Explorer School** which provides educators of grades 4-12 access to NASA's people, missions, research and facilities through a comprehensive set of NASA's classroom materials to teach science, technology, engineering and mathematics (www.nasa.gov). There is a library linking to NASA's innovative research and scientific discoveries. NASA professionals support teachers to implement NASA materials into classrooms. Live video chats are able for students to ask real-world missions, projects, and career-related questions to NASA experts.

3.2. Production

3.2.1. Basic Tech classes

Table 4. Basic Production

Visual and Performing Arts	It is initial level of digital media.	Students and Teachers benefit from digital classes. Teachers and students use technology tools in their lessons every day. Students learn from their challenges, celebrate their successes, and share their resources in every episode.
Digital Camera Recording	- <u>Putting cameras in the classroom</u> -Teachers and students are being recorded.	- <u>Teachers and students could watch and analyze effective and ineffective part of their teaching.</u> -Improve the parts poorly and well.

In **visual and performing arts (table 4)**, students learn how to shoot, they learn how to edit, they also learn how to research, and they learn how to write. The introduction to video class is where students work on projects that are cross-curricular.

In **digital camera**, teachers and students record their performance into camera. Later, they watch to assess their performances. Teachers may take advise from their other colleagues.

3.2.2. Tech classes advanced

Table 5. Advanced Production

Advanced Visual and Performing Arts	-Advanced media broadcast -Advanced video Production class	Students obtain skills demanded in the market place.
Teaching digital media	High school journalism	Students learn how to convey information
Animation class	Students learn how to draw, animate and synchronize.	
Computer class and Gamification	Learn coding Interest-driven learning	we had a reader that was in tenth grade who read at the sixth grade level, was not faring well in school. I handed him a fifteenth grade level text from the game and he's reading it with absolutely fine comprehension, 94- 96 percent accuracy.
Designing a game	-Create a open platform to design games. -Learn gamestar mechanic	Learn how to solve the problem through IT technologies How to narate stories
After School Programs for technology	-Library -Senior students teach to junior students	96% of attendees have less digital skills than Silicon Valley children's before the After School Program. This gap is totally closed.

An **advanced media broadcast class**, a TV show that students produce that airs at the school level (table 5). So the entire school watches their show. Students get into video production. Students work with other companies that maybe hire them. At the end of semester, students can take the test to become certified production.

An important contribution to spread online media from non profit organization is the Journal Education Assiciation.

The Journalism Education Association is the largest scholastic journalism organization for teachers and advisers. we educate teachers on how to educate students. High school journalism believes the media adviser's role is many-faceted and includes but is not limited to modeling standards of professional journalistic conduct and empowering students to learn and grow as they make decisions of style, structure, presentation and content.

Animation is an area that covers all of academics. If a student is creating characters, he should understand mathematics, human and animal anatomies and muscle structures. One needs to understand geometrics to plot coordinates (X, Y, and Z coordinates). Moving an object requires physic concepts. The combination of these disciplines make things moving believably. Good command of language will allow write the screenplay for the speech of animation characters.

The animation concept by itself alleviate students boring classroom environment. Indeed the classroom is a studio rather than regular class.

In the **computer class**, students are learning the coding and making an educational video game for an elementary class. To use game elements for education is **Gamification**.

Students in high school interview other the students in elementary school to know them and find out what kinds of music they listened to, what movies they like, the cartoon characters that they follow, the video games that they already play. Students also interviewed teachers and found out what the learning objectives are, y going there and really seeing what their classroom was like, we were sort of immersed into their world, and we understand that we're creating something for them.

The software that students use is Processing which is initiated at the MIT Media Lab. It uses the Java syntax. Processing provides a built in graphics library and an easy development process. if a student wants to be a computer or a scientist, it's a good starter. We form teams and the teams go through a brainstorming process and an idea refinement process.

The different roles that the students take on are the technical, graphical and project management. For instance the student who is charged with Project manager reminds other students'schedules and duties.

The team visits elementary school to get the feedback about the prototypes. The students take that feedback to help them shape their games. There are two most aspects of gamification is to attract people and furnish rich resources.

Video games are very well-designed, both for learning, but also to capture interest, to be captivating, motivating. One way to attract to technology is to converst video game consumer into the video game producers. When it has a good story it comes through to the player just like when you're reading a storybook. It's fantastic to allow them to express themselves in the pure art form. What's really interesting though is if they understand the broader context of how those mechanics can be used in other areas. In video games, students beenfit from Gamestar mechanic.

Library provides the space, provides the library, and digital youth network collaborated by universities and highschoools in Chicago and foundations provide the digital mentors who collaborate collectively with the librarians to create opportunities, learning opportunities, digital opportunities for youth. Digital youth netowrk is an **after school program**. The program contains what we study in advanced consumption part including creating videos, games, music and songs. The difference is that students overtime become mentors and teachers in the program. So, students are taking responsibilities of other students to teach their skills. Senior students have own classes, develop own curriculum and are getting paid (Warre, 2010)

As online administrators, one of our jobs is to ensure that the coursework and the teachers are really up-to-date with the daily workings of the class. We're looking for how frequent teachers post announcements, the overall communications they have with their students.

The opportunities of online education is ranging from sociology to economics to government. The flexibility of online learning allowed to work full-time and take community college classes while completing high school. On line course can be personalized. Course content is available on demand so students can work at their own pace, and they develop close one-on-one relationships with their teachers. Any student finds the same opportunities, the same credits, and the same challenges that are going to get them to excel in their future life.

CONCLUSION

It is crucial to integrate the curriculum into technology. Giving every student what they need, and giving them that differentiated instruction is where the society benefits from technology. Students are getting fast feedback and they're able to move at their own pace. I'm also able to support the students who really need my support. Administration should encourage students to use all the technological tools that are available to them.

In technology integration there are four main applications: basic-consumption, advanced-consumption, basic-production and advanced-production.

In the consumption, technology is already created outside of the class, students and teachers take advantages. In the basic consumption, students are encouraged to use daily task. In this category most of the examples are related to social medias, open source programs and emails. Some teachers find that students themselves are often on social media. Instead of looking at social media as a distraction, teachers would rather use it to engage them. In the advanced consumption, students perform their assignment through technology. Doing assignments and presentations by using google docs, power points, iMovie, and a poster are further steps from basic consumption. Teachers may apply the available technology into education.

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