

# Assimilating Smart Devices In The Practice of Teaching And Learning To Bring An Effective Learning Environment

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**Abstract:** *There is an unprecedented development of technology in manifold ways. The number of innovations almost double every two years. Still, most of the classrooms around the world are left with the rudimentary educational environment, "the traditional learning style"; when I say 'traditional,' it only refers to the board and pen. I do not deny the fact that smart boards are already available in the market. But my fundamental question is: "Have the smart boards and other gadgets changed the teaching style in any way?"*

**Keywords:** Smart devices, Effective Learning, smartphones

## I. Introduction

A few years ago, we were talking about E-learning, E-Commerce, and E-Banking. E-Commerce and E-Banking have met with tremendous success. But what happened to E-Learning? Why has E-Learning failed? How has E-Banking taken off to the skies? Isn't there any risk in E-Banking? Is E-Banking not vulnerable? Let's admit it - In one way or the other, we all run after money, and we want that money to be safe. Yet, how is it that we allow banking online but not learning online? According to my, the reason behind the success of E-Banking is that it is designed to cater to the specific needs of the end-user. In other words, the users can manage their banking tasks and take care of their financial business sitting in front of their computer.

What have we done to develop E-Learning? We have a team that uploads the contents and makes the contents available on a website we call *E-Learning Platform*. Now, who are the people using these websites? Do the learners have access to these websites outside the campus? The answer is NO. Teachers may use the contents in the classroom, and it is in the same model in existence to this day. If you do not allow the end-user to utilize the system, how can it be successful? The entire world is talking about Student-Centered Learning and Flipped Classrooms, which prompts me to ask two questions: how far are the schools and colleges ready to integrate Student-Centered Learning concepts? Are the educators prepared with the technology and knowledge to put

them into use? This presentation will outline how effectively technology can be used to make SCL a successful one.

Twenty years ago, the educators were well aware of the learner, and they knew the learner's family background and were directly connected with the learner's parents. Moreover, a teacher now guides through the life of a learner. Since the education systems worldwide turned to become a business, there is minimal interaction among the teachers and parents. Most parents are called for a meeting called parents-teachers meet, and it falls after an assessment to inform the ranking of the grade of a student to the parents.

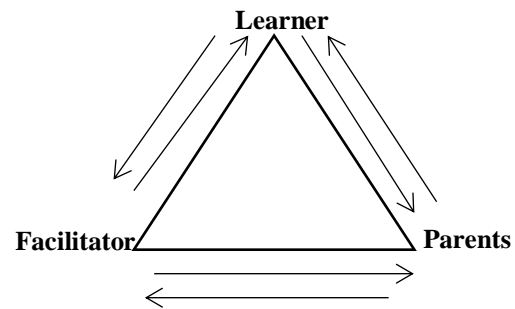


Figure 2.1 Facilitator-Parent-Learner Triangle

So enabling smartphones in learning brings a direct connection between teacher-student-parent relationships through custom apps to keep the parents informed about their child.

## II. Problem Statement

When we say about technology, it is two-sided that one as a provider of server and the other as a user or client. All technology in the classrooms is only focusing on the service provider or server (educator) point of view. Only a few technologies are focusing on the learners who are called the clients in the education system. We have smartboards, microphones, and speakers in the classroom, addressing visual and auditory impairment. If there is no useful course



material designed to use with these technology devices, they act as traditional aids and do not make any meaning in student-centered learning. Educators feel that allowing the learner to use a smartphone in the classroom will be troublesome. At the same time, we are requesting learners to bring 10kg of books every day and waste tons of paper. Can does technology serve only corporate? Don't we have a possibility to integrate learning fully through technology?

**III. Allowing the learner to use a mobile phone**

Most of the educators report that allowing phones in the classroom might divert the attention of bored learner from lecture and make him/her be connected to the internet world or with the personalized social networking world also gives a way to look up the answers on the internet during tests or exams and cheat. On the other hand, the internet has a tremendous amount of information, forums, knowledgebase, and blogs that can be used for learning. Also, there are more apps and technological devices as parental control to control smartphones presented in an area. In this era, smartphones are in the hands of everyone. Also, smartphones are coming at an affordable price. Smartphones are not just a phone to make call or device to chat over internet protocols. It is a device with multimedia functions enabled. A perfect user interface design can attract any learner towards learning.

**Security:**

There are many security mechanisms available to control and manage mobile users on campus using the software and hardware. Portable jammers can be used to disconnect the mobile radio signals within a range of areas. A firewall can be used to filter content based on their reputation. The custom-based parental control software can be developed to control the use of mobile chatting tools and plagiarism. Once they connect to a specific network, then their entire communication logs can be sent to a server or a display screen with proper color code so that the facilitator can instantly see if anyone does anything apart from classwork.

**Data Access:**

WIFI devices can be used to give access to the intranet and internet. Custom-developed apps can be used to generate questions with a random variable so that data can be varying in the problem or quiz given to the learner. A learner can directly get connected to the course contents from e-learning sites. Like custom-made video sites, YouTube can be hosted internally and allow the learners to communicate concepts and theory.

**Power:**

Smartphones require a small amount of voltage, so all learners can have a USB power port to charge. It is recommended to generate power using solar panels to support green energy and safety.

**Advantages:**

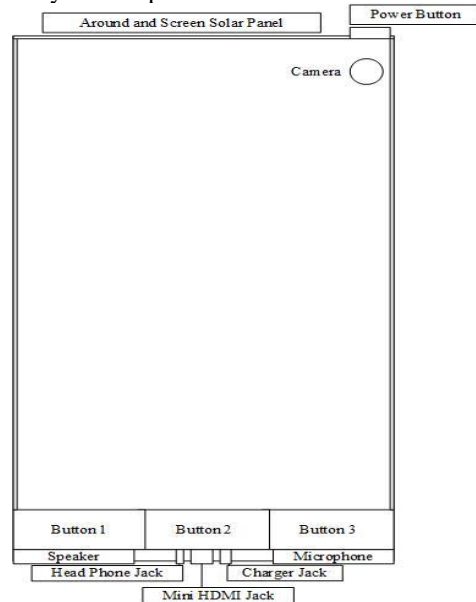
- Smartphones are portable, and learners can take them with them to anywhere they go so they can make use of them while they travel by train or bus; thus, learning is not limited to a place.
- Anywhere and anytime, the concept can be achieved by integrating smartphones into the learning process.
- Custom apps can be developed to encourage the learner through their interests.
- Easy to make a personalized evaluation on learning using a smartphone.

Figure 2.1 illustrates a classroom with a mobile device enabled.

**IV. Developing a new device to support learning**

**Hardware Design:**

The time has arrived to recognize the need for unique hardware to be in the hands of every learner. Developing a custom device for learning may not cost much. Products like e-slate are already in the market to support writing and language learning needs. So if we reengineer the smartphone, we can arrive at the right technology device for learning. Most of the smartphones are vendor-specific, so there is variance in the operating system, hardware, and design. So they are not unique to meet the needs of the education sector, or the apps cannot be used for all versions of the operating system. The major challenge to deploy a device is the power source. In order to address this, the block diagram has a solar panel around the screen, which can directly convert the sunlight to energy and saved in the battery as well as a power connector to directly connect to the AC power. 4.1 shows the block diagram of a device to address most of the challenges being face by a smartphone:



The hardware design illustrates three buttons and a touch screen to meet all the needs to interact with the applications. It has a speaker, headphone jack, mini HDMI jack, microphone, camera, and LED display for input and output facilitation. Charger jack and mini HDMI jack can be used to transfer data from and to the device.

**Software Design:**

Software architecture for a learning device requires more managing and monitoring mechanism to meet the goal. By monitoring and managing all the devices from a portal, we can integrate a device into the learning process. Figure 4.2 illustrates the software architecture for a smart device. This concept can also be incorporated into a smartphone with custom apps.

<b>Monitoring Applications</b>		
<b>Managing Applications</b>		
<b>Basic Applications</b>	<b>Educational Applications</b>	<b>Managing Agents</b>
<b>Phone Hardware and Software Security</b>		
<b>Phone Operating System</b>		
<b>Phone Hardware</b>		

The hardware part is the physical part associated with the peripherals. An operating system is the abstraction layer to communicate with the hardware and the software. Security software is the tool developed to communicate with the security devices around the campus and the smartphone. Basic applications are the software to meet the basic needs such as phone caller, SMS tool, etc. Education Applications are software developed for learning purposes. Managing Agents are the tools developed to push and pull data from and to learning and security monitoring devices. Managing applications controls the overall interaction of the device with the content database or the server. Monitoring applications give the live feed about the learners' gadgets, such as what file they share.

Every classroom should have a screen that displays the activity of the learners with distinguished color codes. The activities which include

1. Smartphones that are powered on
2. Smartphones which are connected to WIFI
3. List of applications that are open in the smartphone
4. Name of the file name and type which are transmitted with destination details

A log application should be active to send all the logs to a log server for future reference.



**Results:**

Most parents agree that their kids are allowed to use smartphones because most parents feel that smartphones should not be allowed inside the classroom for learning. After all, they think that allowing smartphones in the classroom will distract the learners. The majority of the parents feel that smartphones will not replace notes and books because writing helps the learners register the concepts in their minds, and language learning needs to be practiced on paper. I hope that better apps and devices will arise in the market to fulfill all learners' needs.

**Conclusion**

Smart education should influence and inspire the learners to make something new with their creativity. So make the classroom a factory where ideas are evaluated with a prototype using the available tools around the learner and the learning environment. The world is no more in need of employees only entupurnous to workout social issues to rebuild the world for the future generations.

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