



The Pilot Case Study on the Use of Tablet Technology as an Alternative Delivery Mechanism and Learning System for Kindergarten Class in Urban Poor and Predominantly Islamic Learning Communities in the Philippines

By

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A. The Context

The Philippines is a signatory to the UN Millennium Development Goal, MDG where the second goal is the universal access to primary education by 2015. This goal has been reinforced by the Philippine Plan of Action for Education for All, or EFA. The Government of the Philippines has been working extremely hard to realize the goal through large increases in investment in basic education with allocation in the national budget since 2010. The majority of the government investment addresses the quantity of service delivery of basic education through the traditional addition of teachers, textbooks, desk, chairs and classrooms. While these investments have been substantial, currently at 2.5% of GDP, an acceptable average of 6% of GDP in other countries is still far from realizable. Also, studies have shown that investment in these 'brick and mortar' type alone will not be sufficient to achieve the MDG and EFA.

Thus, achieving MDG 2 for the Philippines is certainly not going to be possible. Several recent studies (Luz 2008) have shown that for every 100 learners in Grade 1, only 42 will be able to complete secondary school. A large part, an estimated 58% will join the labor force with very low level of basic literacy. Unlike in other countries, there are more male learners in the Philippines who are dropping out given the need to help out in earning family income. Moreover, the estimated out of school children is quite substantial with one study (Albert et al 2012) estimating it at 3 million learners. This situation is not unique in the Philippines. In the USA and France, a large percentage of the child learners are dropping out of school.

Several reasons or majors factors have been cited on children not being in school, the most significant of which, as mentioned above, is the lack of facilities. On top of this, the Philippines has embarked on reforming basic education with the enactment of Republic Act 9155 or the Governance of Basic Education and the implementation of the Basic Education Sector Reform Agenda or BESRA. BESRA recognizes that basic education is the right of the child and should be centered on the unique learning style of each individual child. Philippine basic education recognized that learning should be learner centered and child rights based.

BESRA included components on Mother Tongue Based Multi-Lingual Education, MTB MLE, the Alternative Delivery Mechanism, ADM and the Alternative Learning System or ALS. These components are meant to address the issue of quality of basic education. Recent research studies have shown that the quality of education is the equally important aspect that is causally related to economic growth. The number of years of schooling and the quality of that schooling are both to be addressed with BESRA. The K-12 program is part of BESRA and its implementation started in 2013.

B. The Purpose of the Study

Researches on learner centered studies using technology including gadgets such as tablet for kindergarten in public school are rare and just emerging. This is not totally surprising since the cost of gadgets is prohibitive, well beyond the affordability of those who are in communities where the income level is considered below or within the poverty line of \$1.25 per day. A study (2009) on the use of technology (public television video) for pre-school children in poor communities have been implemented and reported in the US and that showed favorable education outcomes on recognition of letters and basic stories. The technology did not include the tablet since it was only lately that such a gadget has been more widely available in the market. However, in the USA, there are now 49 states out of the 50 that have initiatives that somehow transitioned into the use of some form of on line education for those in middle school and more predominantly in college levels. In one study done for a five week summer period with high school algebra showed favorable results: 6.4% increase in correct answers for those learners who use technology (Khan academy websites) combined with some level of one on one teacher interaction, compared to 5.2% increase in correct answers for those who did regular summer classes. As to kindergarten level, there are still no published document that have

Perhaps more widely known is the 2013 TED Prize of Hole in the Wall of Sugata Mitra, the Indian who is into the reinvention of the ways children's learning. Mr. Mitra is advancing the theory that learning can be individually self-driven and that technology is there is provide support to the process, notably the use of PC that were installed in remote, rural areas. In the same country but with an initiative from the largest basic education NGO Pratham, a study was done with fourth graders using computer games to improve scores in numbers and mathematics. The results were favorable.

Quite similar to Mr. Mitra is the One Laptop per Child that was initiated by an MIT professor. Recent impact evaluation has shown, at least for one Latin American country that there is no significant contribution to improvement in the quality of education outcomes.

Near us, the Government of Thailand is currently implementing a tablet based learning system with the issuance of an estimated 1.7 million tablets to an initial set of school children and whose ultimate goal is to have all public school use them. However, the variables of quality of content and delivery have been identified as the main hurdle and proving more complex to address. There are still no published researches on this initiative since it was only started in 2012 and the distribution of the tablet is currently on going.

Both One Laptop Per Child and the tablet issuance of Thailand subscribe to the large scale interventions in the use of technology that are prone to 'generalizations' rather than catering to specific context of the learner. Although laudable in scale, there is the tendency for mixed impact to be achieved and sustainability not to happen. With ten million tablets into the hands of learners, Turkey maybe the only country with the largest initiatives so far. However, note that Turkey is a middle income country context.

In the Philippines, as to be expected the review of literature on the use of technology for learner centered education in poor communities at the kindergarten level, having only been implemented this year, did not reveal any published or documented effort. Perhaps then, this is the first documented

study on the use of gadget technology for learners in urban poor and predominantly Islamic community at the kindergarten level.

Thus, the purpose of this study is to document the initial sets of relevant, probably and mostly significant variables that are the determinants of improvements the quality of education outcomes with the use of the tablet in kindergarten in a learner centered approach to the acquisition of basic literacy. These children are from urban poor communities, mostly Islamic in their religion.

To the extent that is most possible, the mother tongue will be used in the delivery of the lessons with the tablet as the tool or the substitute textbook or learning material. Although there are textbooks to accompany the lessons, these are not readily available and are not given free even though there is the state policy for such provision to be available at no cost to those who are in public school. As mentioned earlier, the level of investment in basic education is still not sufficient to address the appropriate quantity of inputs. The use of the tablet is the substitute for the lack or absence of textbook in kindergarten so that individual learning can take place at the present time and in the appropriately learner centered manner even as there is shortfall in public investments.

C. Duration of the Study

The study lasted for three months, including report drafting and finalization.

D. Theoretical Foundation

D.1 The Theoretical Bases of the Initiatives of Mr. Sugata Mitra

Mr. Mitra has done numerous experiments anchored on self-organized learning environments (SOLE) that are based on the following theories:

- The constructivism theory to explain that children are self-directed in their learning and that learning takes place even without the present of supervision of teachers and adults. Learning can take place inside and outside of the classroom.
- The philosophy of child development that play and experimentation are valuable parts of learning.
- Collaborative or cooperative learning are at work when learners are together to construct new ideas.

D.2 The Theory of Creative Destruction

Textbooks, notebooks, school test papers and other paper-based manufactured supplies form part of the public school system. Individual learning takes place through these supplies so that learning can happen. All of these supplies came about with the invention of the printing press and the manufacture of paper from wood based materials. With the use of the tablet, the supplies are now based on bytes

that are stored in memory chips. The digital age is now in individual hands with the tablet rather than the book.

The development of the tablet is the result of the creative destruction theory based on the writings of the economist Joseph Schumpeter. Such devices are meant to result to productivity increases through the processing of more and highly relevant data or the presence of processes to bring about new thinking and innovation that brings forth new systems and makes earlier ones obsolete if not uneconomical to undertake again.

With this theory, the use of the tablet as an alternative delivery mechanism with alternative learning system to improve learning outcomes will start the creative destruction of the current paper-based learning mechanism and system.

D.3 The Theory of Human Capital Accumulation

Human beings, that is labor, are considered part of the economic theory of the production function together with capital (equity or financial investment of the technology to produce the goods and services) and land.

Numerous studies on this theory have established the direct relationship between level of education and the returns in terms of employment, that is, for every additional level of education, there is a corresponding increase in earning potential. Thus, the additional year in kindergarten would amount to an additional increase in the return in terms of labor income.

Also, there are studies that relate the education related human capital accumulation of the adult to the potential for the child learner to be in school and stay there to learn and be educated properly.

The level of education of the adult or parent or guardian of the learner is just one, although an important exogenous variables in human capital accumulation. There are also the teachers, the environment where learning takes place and the social related variables of race, gender, and income class.

Human capital accumulation, such as favorable learning outcomes, is a function of endogenous and exogenous variables. The endogenous variables would include the physiological and psychological make-up of the learner.

D.4 Quantitative Evaluation Theory and the Use of Counterfactuals

Quantitative method of evaluation is based on the theory that a dependent variable can be explained by several or multiple independent variables. For example, as mentioned above, the theory of economic production is a dependent variable that is dependent or determined by land, labor and capital: three independent variables of the production function. With this frame of logic, favorable education outcomes, a dependent variable is a function or can be explained or have determinants or are to be explained by both endogenous and exogenous variables.

The evaluation of impact or the measurement of the level of effectiveness of the intervention is best established if there are two major sets of samples: those where intervention has been provided or the counterfactual, and those where none had been provided. One of the tools used for estimating the impact of the intervention, the Randomized Control Trial or RCT is supposed to be the 'gold standard' of impact evaluation and requires two major sets of samples, the counterfactual and the current situation where no intervention takes place. Other evaluation tools or methodologies also use the establishment of two sets of samples with one of them the counterfactual, are regression discontinuities, propensity score matching and difference on difference. The bottom line in all of these tools or methodologies is the theory that impact evaluation is done by way of comparing two sets of realities: the existing one without any intervention and the counterfactual or one where the intervention had been introduced.

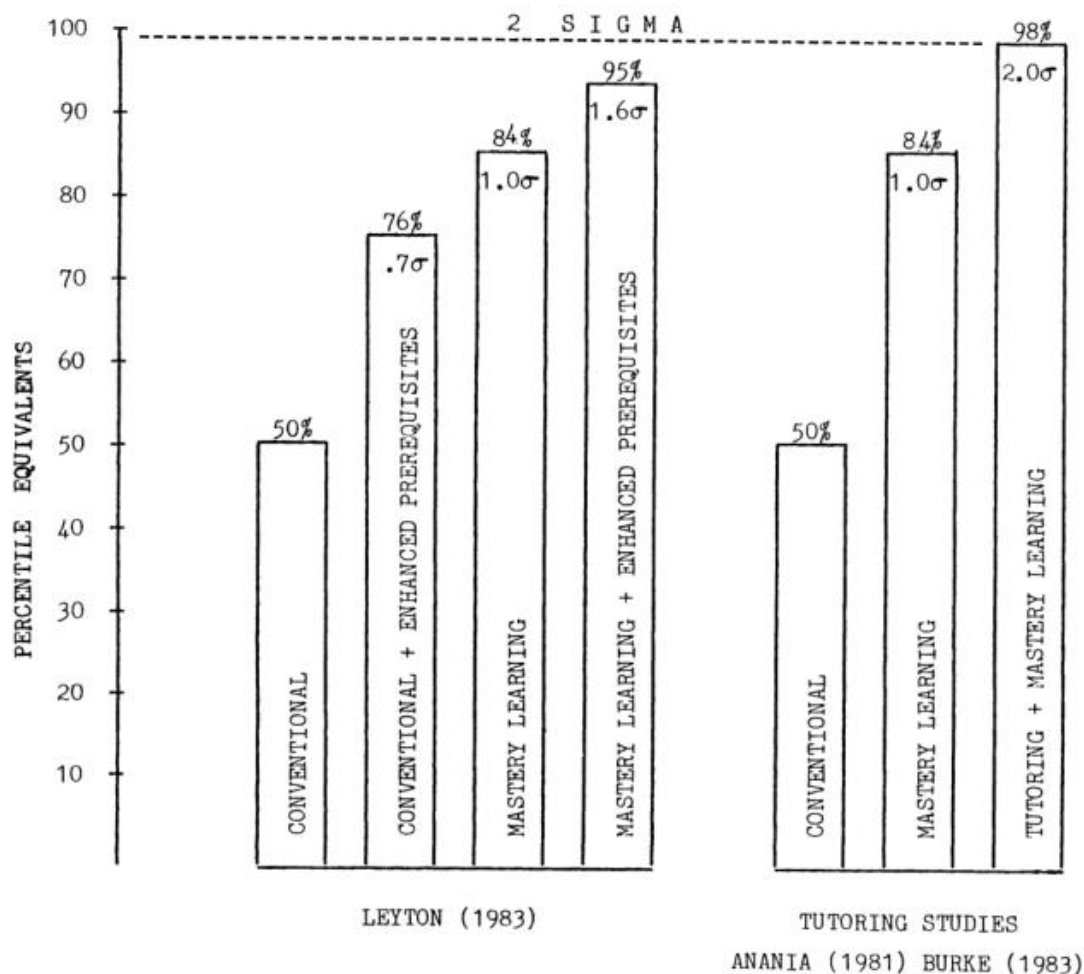
Impact evaluation tools assume that both samples are identical twins in terms of several characteristics. In the case of this pilot study, the identified sample for the counterfactual is done purposively and a non-counterfactual sample is chosen with similar variables of classroom, curriculum and teacher. There is still the need to establish the extent to which the socio-demographic-economic characteristic of the learner is similar. The delivery of the curriculum content with the use of the tablet is the variable that is not similar and is to be assessed as to its contribution to favorable learning outcomes.

Given the limitations in sampling, the study will look at the following independent variables that are to explain or are the determinants of the the level of learning outcomes with and without the use the tablet:

- Exogenous variables:
 - The level of human capital accumulation of the parents.
 - The environment inside and outside of the school for learning to possibly take place.
 - The content and user friendliness of the tablet as a tool for learning the content of the curriculum.
- Endogenous variables:
 - The health aspect of the learner, including the level of food intake and the energy level during the learning sessions in the classroom.
 - The emotional and psychological state of the learner while inside the classroom.

D.5 The Three Pedagogy Study of Benjamin Bloom

Based in the University of Chicago, and well known for the taxonomy of learning, Dr. Bloom published a study comparing three pedagogies for learning that showed that the most effective for learning is done through one on one with a tutor, mentor or teacher, compared to the conventional one-size-fit-all classroom lecture and the mastery level that is combined to check on progress before proceeding to the next subject matter. The published document termed the study as two sigma problem, indicating the need to achieve the ideal one-on-one learning pedagogy.



E. Methodologies for Data Gathering and Content Areas of Data

E.1 Learner Familiarity with the Use of the Gadget and the Technology Application

Given that the public school is located in an identified urban poor neighborhood, it is assumed that the learners are familiar with mobile devices and gadgets limited to the mobile phone, perhaps those that are earlier models. With this assumption, there is a need to gather data on the behavior of the learner during the hand-over the tablet. Also, there is a need to gather data on the behavioral changes of the learner during the early part of the use of the tablet, specifically those related to familiarization of the basic operation of the tablet. The questions will be both qualitative and quantitative, such as:

- What do you call this gadget?
- How come you call the gadget by that name?
- Have you seen such a gadget that is similar to it?
- Where did you see it?
- Who was using the gadget?

- What was the gadget used for?
- Can you show how the tablet is
 - Turned on?
 - How to unlock it?
 - What icon refers to
 - Shapes?
 - Numbers?
 - Letters?
 - Drawings or practice sheets?
 - How to press the icon and make the screen change?
 - How to go back to the previous screen?
 - How to close or turn off the tablet?

E.2 The Out-of-School Life of the Learner in Their Homes and in their Residence

Learning takes place both inside and outside of the school. The role of parents or guardians in promoting and installing the learning environment out of the school would be gathered through focus group discussion and key informant interviews. The questions would include both open and close ended, and that the process will be both structured and non-structured. The initial questions will include:

- What are the top three activities that the child learner is doing in the home during the:
 - Four hours of the morning or between the time the sun comes up and to before eating lunch?
 - Four hours of the afternoon or between the time the child learner has eaten lunch up to before the sun comes down?
 - Evening? What are the rituals before bedtime? How long does the child learner gets to sleep?

The responses to this question are meant to gather the evidence on the education and non-education related activities of the child that are taking place outside of the classroom. The same questions can be posed after two months or the end of the observation period.

The data on the activities inside the classroom is also to be gathered with periodic observations, both behavioral qualitative data and the quantitative measures of these qualitative data.

- What are the top three activities that the adult are doing when the child learner is within their sight or around their neighborhood or area of familiarity such as identified playground, places where adult livelihood activities take place or have transaction related to non-livelihood activities?

This question can be further be specific as regard those that activities in the morning, afternoon and evening.

At the same time, a survey of the total population in the sample will be undertaken to establish socio-demographic-economic profile of the family of the learner. This would include data on:

- Family size
- Level of education of the parent or guardian
- Number of household members with livelihood or employment
- Nature of livelihood or employment

E.3 The In-School Learning Areas of the Learner

At the end of the study, there is a need to assess if the technology intervention was able to bring any improvement in the knowledge, skills and attitudes of the learner. The current assessment form for Kindergarten in the Division of City Schools in Quezon City is the Early Childhood Care and Development Checklist. The checklist rating is only limited to two answers – whether the parameter had been observed (mark of check) or not (mark of dash). This checklist has 108 parameters in seven domains:

- Gross motor
- Fine motor
- Self-help
- Receptive Language
- Expressive Language
- Cognitive
- Social-Emotional

These parameters were established with the assumption that the traditional delivery mechanism and learning system. There is no checklist for alternative delivery mechanism and learning system. Perhaps this study will contribute and start the establishment of a checklist that incorporates the use of technology such as those found in the tablet.

This study is limited to the applications that had been found available and at no cost. These applications include those related to:

- Drawing
- Letter recognition
- Number recognition
- Shape recognition

Given this limitation, the study will assess the ability of the learner on the recognition of letters, numbers and shapes.

E.4 The Use of the Application to Deliver the Curriculum

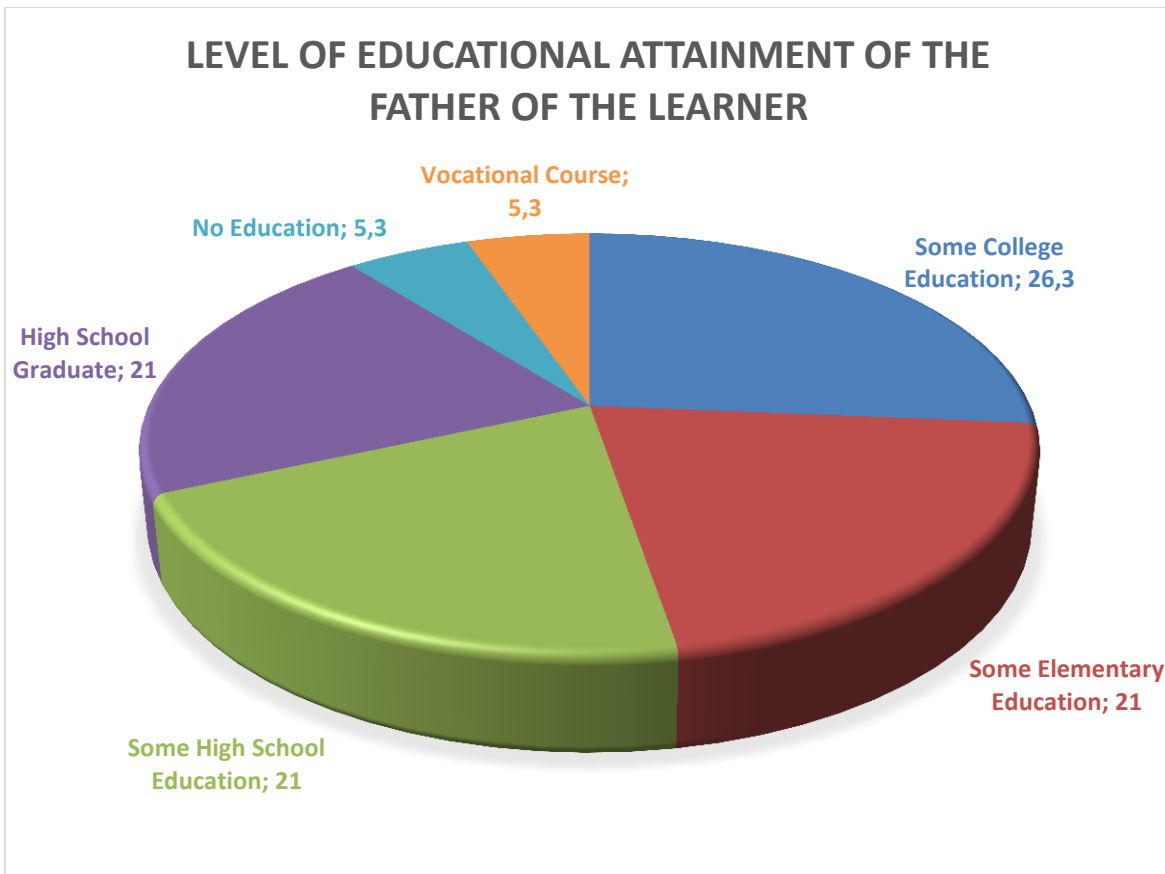
It is important to state that the applications are not yet related in any way with the curriculum. It is the intention of the study to explore the possible areas where the applications can be used as part of the delivery of the curriculum. To make this happen, at some point after the introduction of the tablet, the teachers will be convened in a focus group discussion to elicit response to the following questions:

- How will the application be used to address learning related to recognition of letters, numbers, shapes and possibly parts of the body?
- How will the assessment be made to ensure that the testing is not biased?
- What are the different skills and competencies required for the teacher to know the use of tablet for improving favorable learning outcomes?

F. Results and Observations

F.1 Selected Socio Demographic Profile of Learners in Sample with Tablet Use

Level of Educational Attainment of the Father of the Learner																						
19 responses from 26 population																						
Sample with Tablet Use																						
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	Total	%	Cum
No Education										1										1	5.3	5.3
Some Elementary Education	1					1		1							1					4	21	28.3
Elementary Graduate																				0	0	28.3
Some High School Education			1				1									1			1	4	21	49.3
High School Graduate									1			1					1	1		4	21	70.3
Some College Education		1		1							1	1			1					5	26.3	96.6
College Graduate																				0	0	0
Vocational Course					1															1	5.3	100

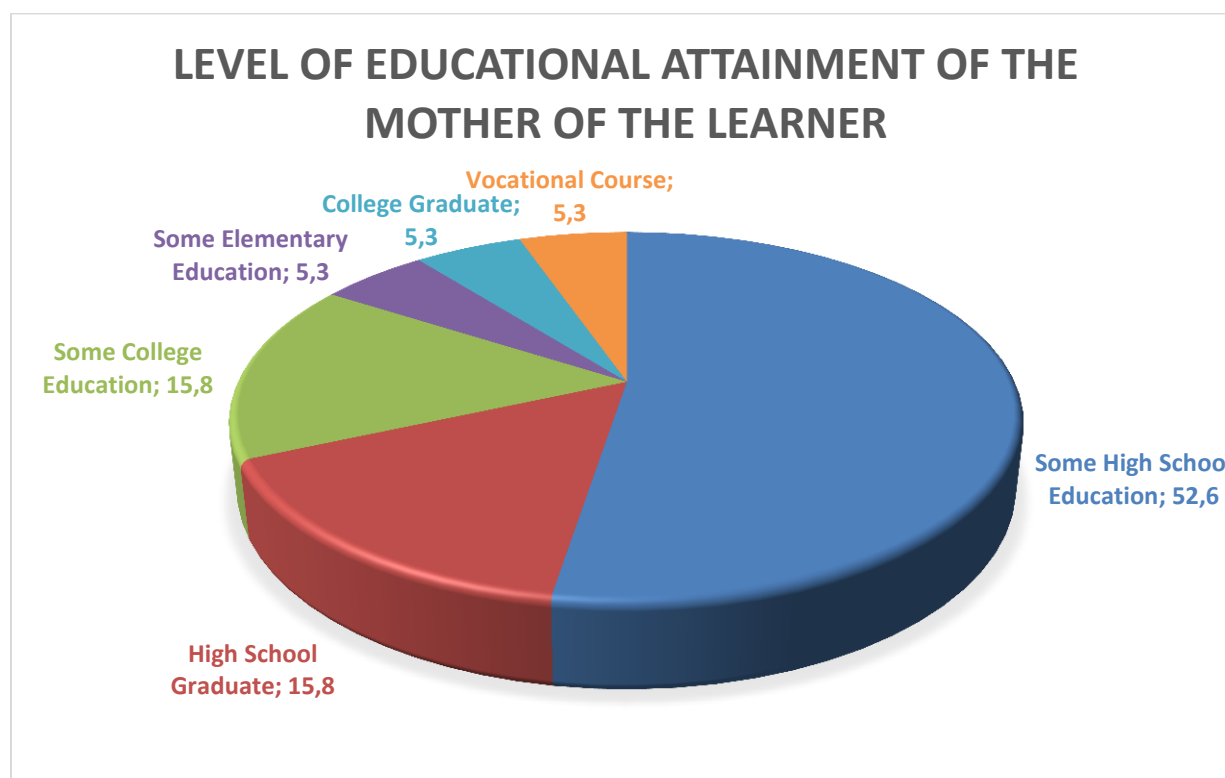


Analysis

The data is showing that:

- Nearly a third or 30% of the fathers have not even finished elementary education.
- Half of the fathers did not finish high school.
- No father was able to finish college education.

Level of Educational Attainment of the Mother of the Learner																						
19 responses from 26 population																						
Sample with Tablet Use																						
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	Total	%	Cum
No Education																				0	0	0
Some Elementary Education	1																			1	5.3	5.3
Elementary Graduate																				0	0	5.3
Some High School Education		1	1	1	1	1	1	1				1				1			1	10	52.6	57.9
High School Graduate									1				1					1		3	15.8	73.7
Some College Education										1	1				1					3	15.8	89.5
College Graduate																1				1	5.3	94.8
Vocational Course														1						1	5.3	100



Analysis

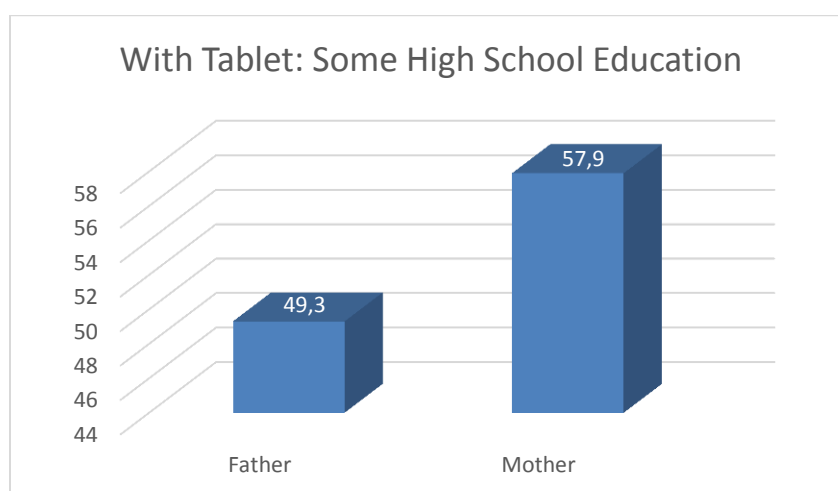
The data is showing that:

- All mothers have some level of education.
- More than half, 57.9% of the mothers have some high school education.
- Nearly a quarter, 73.7% of the mothers have reached high school education with 3 mother having completed it.

When the education of the father and the mother are compared, the data is showing that:

- The mothers have more years of education, 14 mothers having reached or completed high school level, than the father with only 9 fathers, validating the general observations of recent studies that it is the male more likely to drop out of school and have less years of education.

Level of Educational Attainment of the Both Father and Mother of the Parents of the Learner									
19 responses from 26 population									
Sample with Tablet Use									
Level of Education	Father			Mother			Grand Total		
	Total	%	Cum	Total	%	Cum	Total	%	Cum
No Education	1	5.3	5.3	0	0	0	1	2.6	2.6
Some Elementary Education	4	21	28.3	1	5.3	5.3	5	13.2	15.8
Elementary Graduate	0	0	28.3	0	0	5.3	0	0	15.8
Some High School Education	4	21	49.3	10	52.6	57.9	14	36.8	52.6
High School Graduate	4	21	70.3	3	15.8	73.7	7	18.4	71.0
Some College Education	5	26.3	96.6	3	15.8	89.5	8	21.1	92.1
College Graduate	0	0	0	1	5.3	94.8	1	2.6	94.7
Vocational Course	1	5.3	100	1	5.3	100	2	5.3	100
Total	19	100	100	19	100	100	38	100	100



Analysis:

The data is showing that:

- Just over half of the parents, 52.6% have education up to some level in high school. Or, half of the parents have graduated high school and have reached some level of college education or vocational course. One parent even completed college.
- Just over a third of the parents, 36.8% have reached some level of high school.

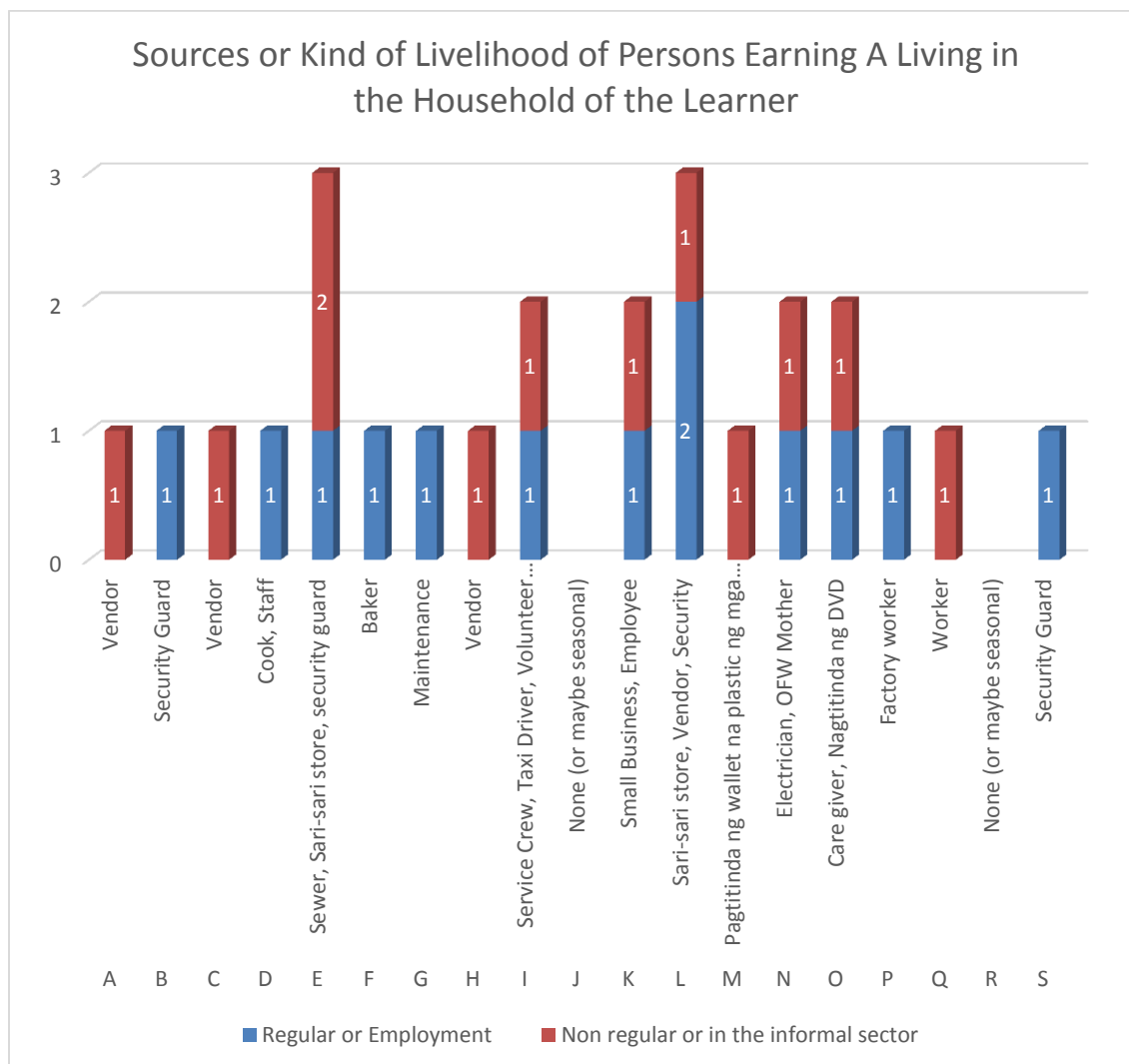
Family Size, Persons in School, Persons with Livelihood, Dependency Ratio in the Household of the Learner 19 responses from 26 population Class Sample with Tablet Use																						
Learner/ Parameter	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	Mean	Median	Mode
Number of Persons in Households	6	4	6	4	7	5	3	4	8	6	5	13	5	4	4	6	5	4	4	5.4	5	4
Number of Persons in Households who are still in school	4	2	4	1	3	1	1	1	3	2	1	2	1	1	1	3	1	1	2	1.8	1	1
Number of Persons in Households with Livelihood	1	1	1	3	3	1	1	2	3	0	2	3	3	2	2	1	1	1	1	1	1	1
Dependency Ratio	6	4	6	1.3	2.3	5	3	2	2.7	0	2.5	4.3	1.7	2	2	6	5	4	4	3.4	6	3.5

Analysis:

The data is showing that:

- The more frequent occurrence would be a learner with a family of 4, having one child in school and having one of the parents working, the other parent, probably the mother stays and take care of household related matters.
- There is one household where there is no source of income during the conduct of the survey, indicating that some seasonality in work or employment.

Sources or Kind of Livelihood of Persons Earning A Living in the Household of the Learner 19 Respondents of 26 total population Class Sample With Use of Tablet			
Leaner	Kind of Livelihood of Those Earning a Living in the Household	Regular or Employment	Non regular or in the informal sector
A	Vendor		1
B	Security Guard	1	
C	Vendor		1
D	Cook, Staff	1	
E	Sewer, Sari-sari store, security guard	1	2
F	Baker	1	
G	Maintenance	1	
H	Vendor		1
I	Service Crew, Taxi Driver, Volunteer Worker	1	1
J	None (or maybe seasonal)	0	0
K	Small Business, Employee	1	1
L	Sari-sari store, Vendor, Security	2	1
M	Pagtitinda ng wallet na plastic ng mga kape		1
N	Electrician, OFW Mother	1	1
O	Care giver, Nagtitinda ng DVD	1	1
P	Factory worker	1	
Q	Worker		1
R	None (or maybe seasonal)	0	0
S	Security Guard	1	
Total		13	12



Analysis:

The data is showing that:

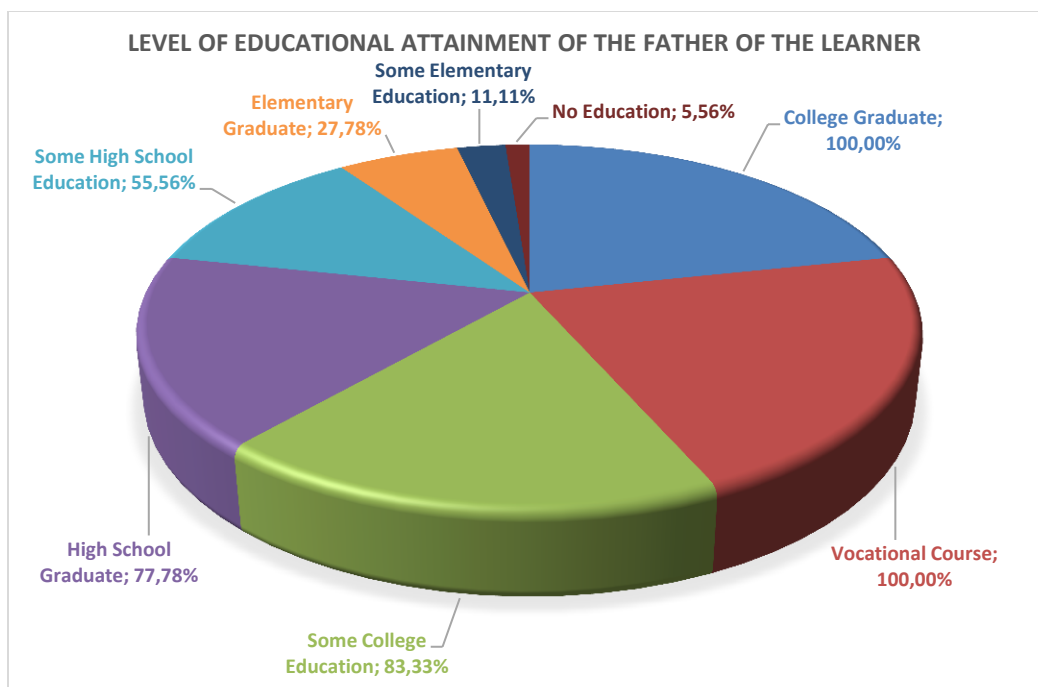
- Those who have regular employment would be those that use mostly labor intensive skills such as security, factory work and service crew of food establishments.
- Those who have livelihood that are not regular employment would be those that have small to micro enterprises such as sari-sari stores and trading of basic consumables which in most cases would be related to food consumption.

Level of Educational Attainment of the **Father** of the Learner

18 Respondents

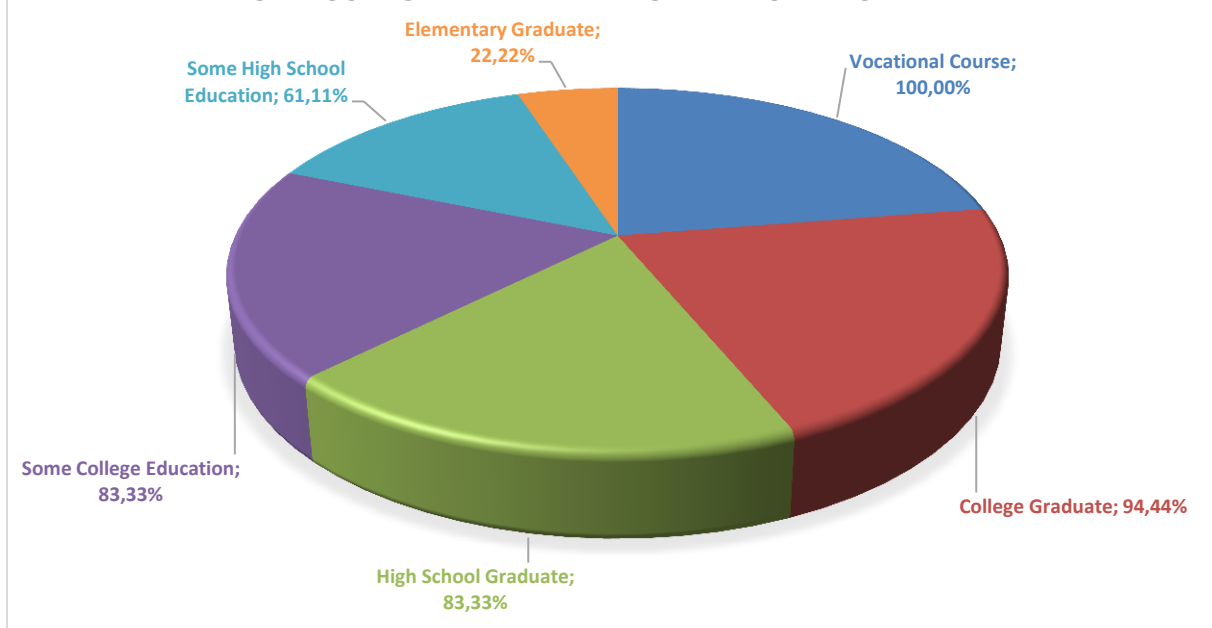
Sample without Tablet Use

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	Total	%	Cum
No Education																	1		1	5,56%	5,56%
Some Elementary Education										1									1	5,56%	11,11%
Elementary Graduate			1					1										1	3	16,67%	27,78%
Some High School Education	1						1							1	1	1			5	27,78%	55,56%
High School Graduate		1			1							1	1						4	22,22%	77,78%
Some College Education						1													1	5,56%	83,33%
College Graduate				1					1	1									3	16,67%	100,00%
Vocational Course																			0	0,00%	100,00%
Total																			18		



Level of Educational Attainment of the Mother of the Learner																					
18 Respondents																					
Sample without Tablet Use																					
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	Total	%	Cum
No Education																			0	0,00%	0,00%
Some Elementary Education																			0	0,00%	0,00%
Elementary Graduate						1					1				1			1	4	22,22%	22,22%
Some High School Education	1	1	1				1	1						1		1			7	38,89%	61,11%
High School Graduate				1					1			1	1						4	22,22%	83,33%
Some College Education																			0	0,00%	83,33%
College Graduate					1					1									2	11,11%	94,44%
Vocational Course																	1		1	5,56%	100,00%
Total																	1		18		

LEVEL OF EDUCATIONAL ATTAINMENT OF THE MOTHER OF THE LEARNER

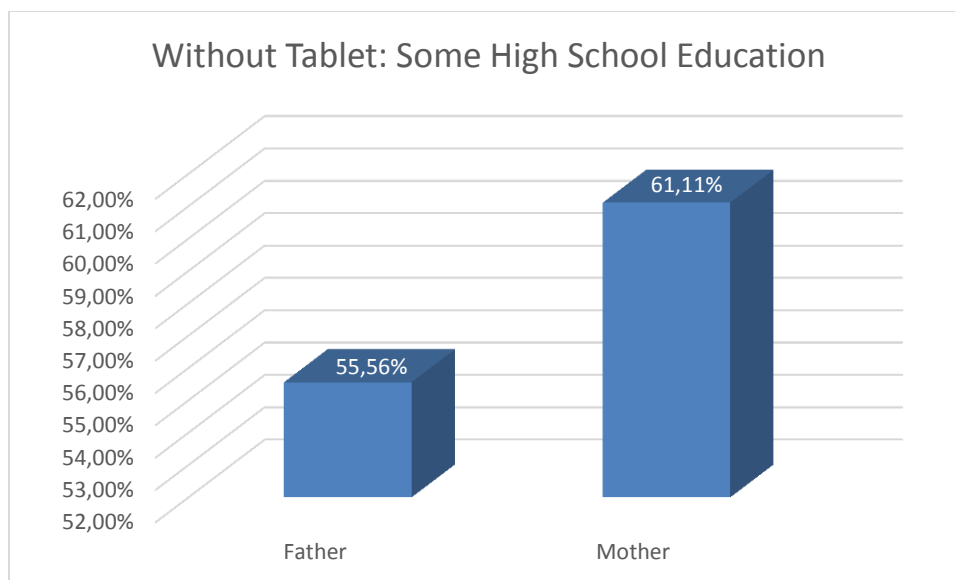


Level of Educational Attainment of the **Both Father and Mother of the Parents** of the Learner

19 responses from 26 population

Sample with Tablet Use

Level of Education	Father			Mother			Grand Total		
	Total	%	Cum	Total	%	Cum	Total	%	Cum
No Education	1	5,56%	5,56%	0	0,00%	0,00%	1	2,78%	2,78%
Some Elementary Education	1	5,56%	11,11%	0	0,00%	0,00%	1	2,78%	5,56%
Elementary Graduate	3	16,67%	27,78%	4	22,22%	22,22%	7	19,44%	25,00%
Some High School Education	5	27,78%	55,56%	7	38,89%	61,11%	12	33,33%	58,33%
High School Graduate	4	22,22%	77,78%	4	22,22%	83,33%	8	22,22%	80,56%
Some College Education	1	5,56%	83,33%	0	0,00%	83,33%	1	2,78%	83,33%
College Graduate	3	16,67%	100,00%	2	11,11%	94,44%	5	13,89%	97,22%
Vocational Course	0	0,00%	100,00%	1	5,56%	100,00%	1	2,78%	100,00%
Total	18			18			36		



Family Size, Persons in School, Persons with Livelihood, Dependency Ratio in the Household of the Learner

18 Respondents

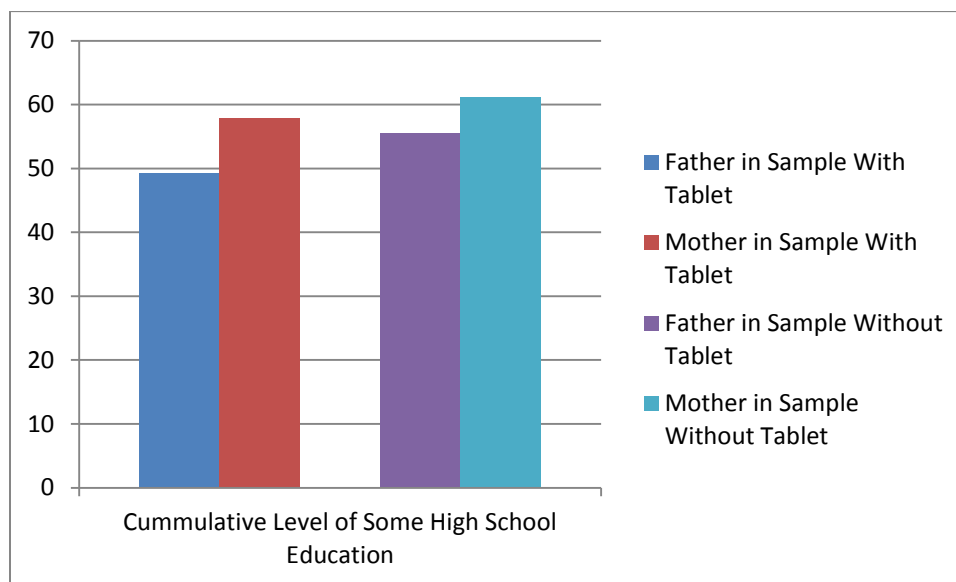
Class Sample without Tablet Use

Learner/ Parameter	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	Mean	Median	Mode
Number of Persons in Households	6	4	12	12	6	2	6	4	7	9	4	10	4	4	8	3	0	6	5,9	6	6
Number of Persons in Households who are still in school	1	1	6	6	3	1	3	0	2	3	2	4	2	1	5	1	1	2	2,4	2	1
Number of Persons in Households with Livelihood	2	1	2	2	1	0	1	1	1	3	1	2	1	1	2	1	0	2	1,3	1	1
Dependency Ratio	3	4	6	6	6	0	6	4	7	3	4	5	4	4	4	3	0	3	4,0	6	4

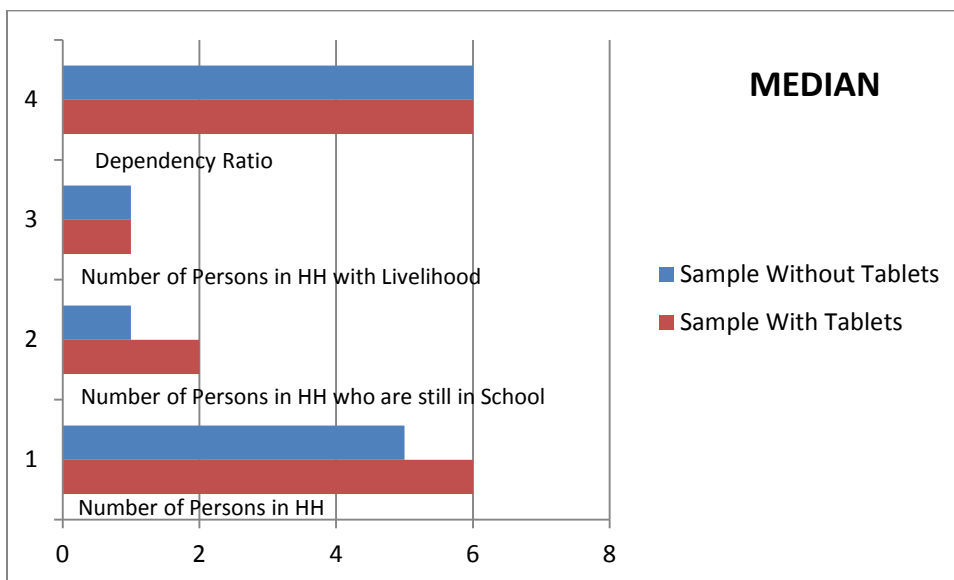
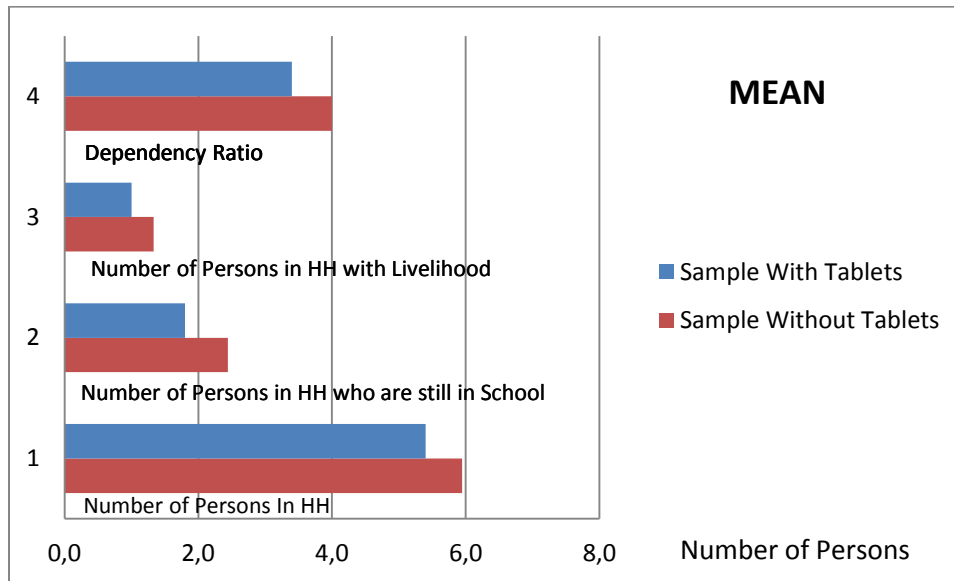
Sources or Kind of Livelihood of Persons Earning A Living in the Household of the Learner			
18 Respondents			
Class Sample Without Use of Tablet			
Learner	Kind of Livelihood of Those Earning a Living in the Household	Regular or Employment	Non regular or in the informal sector
A	Driver	1	
B	Vendor		1
C	Sari-sari store, Employee	1	1
D	Sari-sari store, Employee	1	1
E	Employee	1	
F	Construction Worker		1
G	Side walk Vendor(vegetables)		1
H	Vendor		1
I	Security Guard	1	
J	Employee	1	
K	Vendor		1
L	Welder, Cook	1	1
M	Construction Worker		1
N	Tricycle Driver		1
O	Driver, kasambahay	1	1
P	Construction Worker		1
Q	Vendor		1
R	Stylist, Caretaker		2
Total		8	15

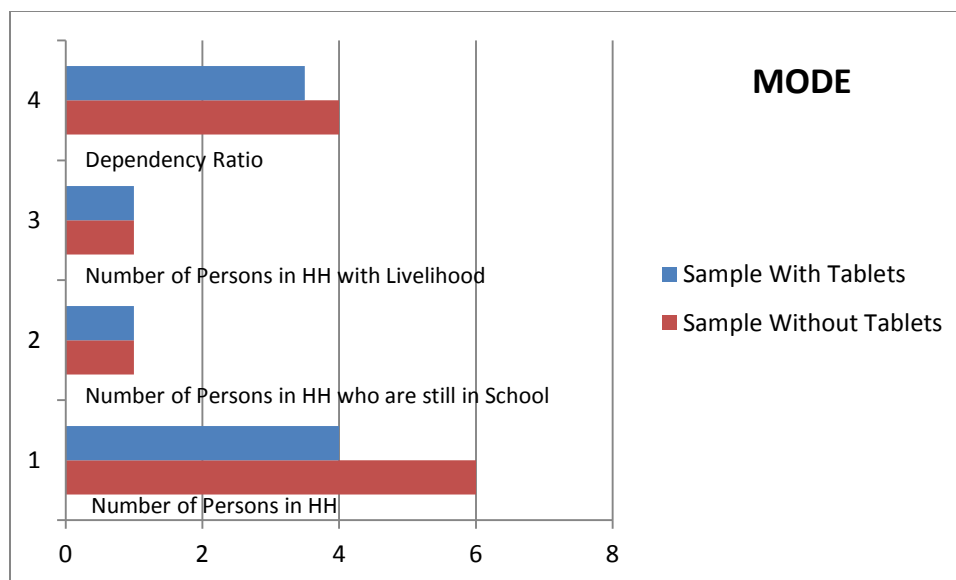
Comparative Information of Extent of High School Education of Two Samples				
Sample	With the Tablet		Without the Tablet	
Parent	Father	Mother	Father	Mother
Some High School Education	49.3	57.9	55.56	61.11

Comparative Level of Education of Samples With and Without the Tablet



Household Characteristics





Body Mass Weight Index

	With Tablet			Without Tablet		
	Male	Female	Total	Male	Female	Total
Undernourished	67%	50%	59%	50%	38%	44%
Ideal	33%	50%	41%	50%	46%	48%
At Risk	0%	0%	0%	0%	15%	8%
Total	100%	100%	100%	100%	100%	100%

The class with the tablet has more undernourished learners, predominantly boys where a third are not at the proper weight for their age compared to half of the boys in the class without the tablet.

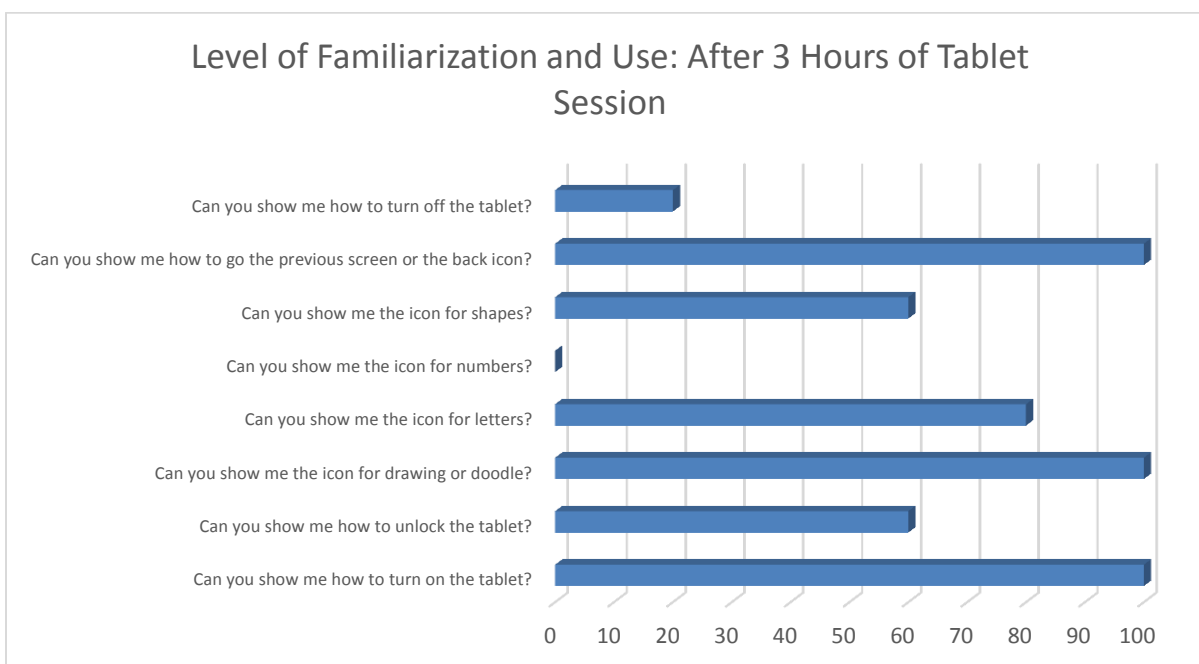
F.2 Results of End of Two Weeks (July 08 to 19, 2013, After 8 days at 30 minutes each day of tablet use session) Diagnostics on the How To's of the Tablet. Conduct 18 July 2013 Thursday morning

Population: 21 child learners

Random, Probability Sample: 5 child learners or approximately 24% of the population

Note that the tablet icon and the menu instructions are all in English words, not in the mother tongue of the learners in the sample.

Question	Response Metric : 1 for Yes or able to do the operation and, Zero for No or not able to do the operation					Total	%
1 Can you show me how to turn on the tablet?	1	1	1	1	1	5	100
2 Can you show me how to unlock the tablet?	1	1	0	0	1	3	60
3 Can you show me the icon for drawing or doodle?	1	1	1	1	1	5	100
4 Can you show me the icon for letters?	1	1	1	0	1	4	80
5 Can you show me the icon for numbers?	0	0	0	0	0	0	0
6 Can you show me the icon for shapes?	1	0	0	1	1	3	60
7 Can you show me how to go the previous screen or the back icon?	1	1	1	1	1	5	100
8 Can you show me how to turn off the tablet?	0	1	0	0	0	1	20
Total	6	6	4	4	6	26	65
Percentage	75	75	50	50	75	65	



Analysis of the Data

At the end of the second week of use of the tablet, the data is showing that:

- Overall, there is 65% level of skill on how to operate the tablet and know or identify the major features of the tablet.
- 100% or all learners know how to open or turn on the tablet, show the icon for drawing and the back icon for the back menu. On the other hand, only 20% of the learner knows how to turn off the tablet.

- On the letters, only 80% of the learners are able to identify this icon, which is quite a high score. The icon was probably clearly understood on top of the fact that the lesson on letter was included during the last two weeks.
- More than half or 60% of the learner are able to show the icon with the numbers and the shapes.
- Zero or no learner is able to show the icon for number. There could be a problem with the icon since the lesson number 1 has been taken up within the last two weeks.
- Only 20% of the learner is able to close the tablet. There could be a problem with the on/off bottom as well as with the icon on 'ok.'

Three observation events during the first week also revealed the lack of skills in 'pressing' hard versus soft, light touch with the icon. The familiarity with the level of touch, soft rather than hard press, had improved remarkably although there is the sudden burst of hard pressing when the reaction of the tablet is a bit slower or that the level of excitement or the short attention span in the learner is still difficult to manage and change. This excitement is revealed several times in another exercise: sitting down and standing up, where all learners seem to be in hurry to execute the acts with roughness and brusqueness associated with seeming lack of time or a competition for the shortest time to do it, rather than be, as the teacher termed it – princess or prince-like in behavior, slow, with elegance and graceful in demeanor.

Interim Conclusions

In distributing the tablet, there was no instruction that was given on it, like the method used by Mr. Mitra in the experiment of Hole in the Wall. The natural curiosity of the learner was enough to push the boundaries of knowledge with tinkering with the tablet.

There are other observations whose analysis and conclusion is still a work in progress. These are:

- One learner was able to open the tablet within a few seconds after hand over. There is still no explanation if this was pure luck, there is already a level of familiarity with the unit or just simple natural intelligence of the particular child.
- One learner cried in the middle of the first session of the use of the tablet. On the second day, this learner refused to have the tablet and wishes to play with other things, such as the building blocks. On the third session, he still refuses to have a tablet and the teacher sat down and guided him on its features. On the fourth session, the learner was hesitating to accept the tablet and wishes for the teacher to be there to show the operation. On the fifth session, there was no more problem with the learner.

When inquired from the teacher as to this particular behavior, the response was the learner did not have that self-confidence on the gadget. This begs the question as to the source of this lack of self-confidence and can still be explored if an informant interview is done with the adults that are with the learner outside of the classroom.

This report will not be able to explore them. The conclusion for the moment is that the assumption is not totally correct on that all learners will positively welcome a new gadget as the level of self-confidence is also a parameter that can show itself at some point in the early phase of the hand over the gadget, resulting in the emergence of emotions related to sadness and the outburst of cries. The teacher or the adult should be there to address and show the way to overcome this emotion.

- Perhaps the obvious question with the result of the sample diagnostic is how did these learners get to this point of operating the tablet given zero knowledge of the gadget at the beginning? The aspect of socializing was obvious as learners started to interact with each other seeking the help of their seatmate or classmate on the ways to get to a certain program or details on how to steps. This is the manner by which social production or collaborative consumption of learning is made possible: peer to peer sharing and cooperation.
- One salient observation during the sessions with the tablet use is that the learners are able to be quiet given the exploration of the tablet. This indicates the mostly favorable reactions on the affective domain of the learner, or, that the learners are highly interested and embracing the use of technology. Except for the negative emotion of one learner who cried at the beginning of tablet use, all the learners show very positive feedback on tablet use.

F.3 Assessment of the Cognitive Domain

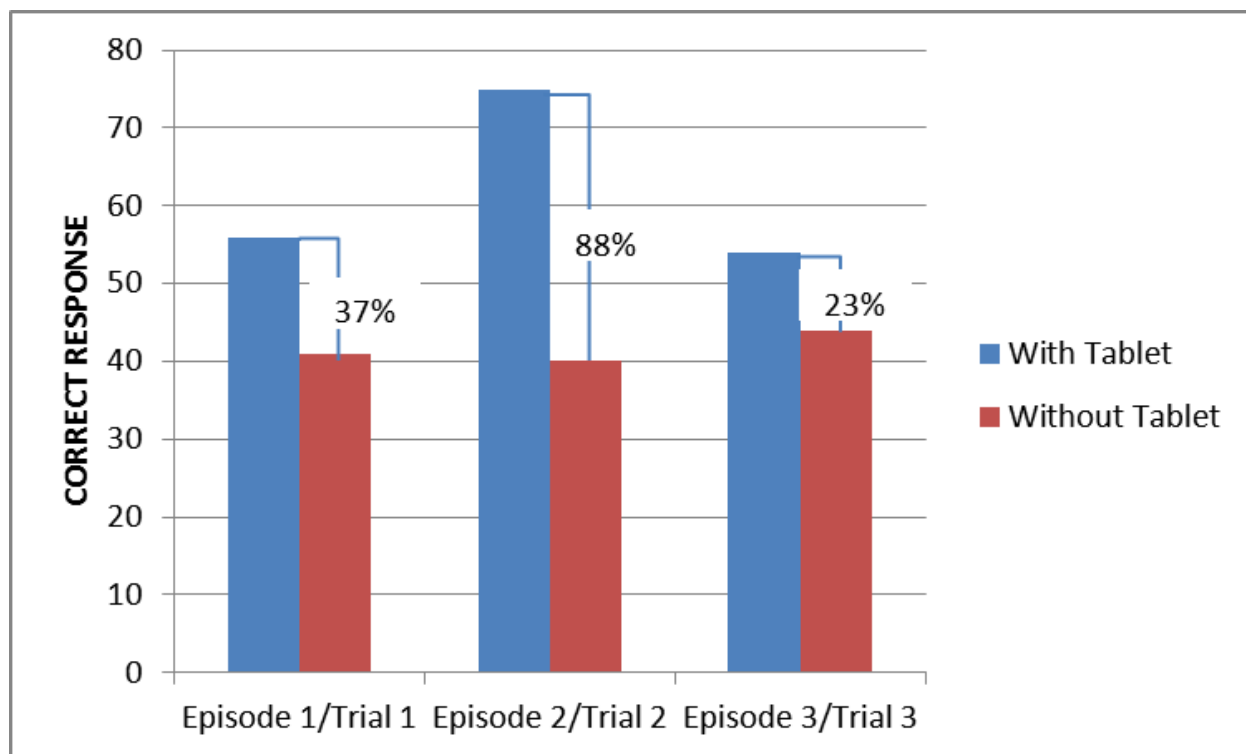
If the affective and psycho-motor domain of the learners is not a major challenge to the use of the tablet, the cognitive domain remains to prove that tablet use is indeed helpful in increasing the possibility that learning takes place.

The assessment of the cognitive domain was done using the same material that is in the mother tongue. To eliminate the variable of the teacher's style and methodology, at the same time mimicking the one-size-fits-all conventional pedagogy, the television with compact disk player was used in the class without the tablet to show the same content that will be seen by those in the class with the tablet.

The choice of the content in both media proved to be no minor challenge. As much as possible, the content has to reflect the curriculum that was implemented during the last two and a half months: storytelling, numbers, colors, and shapes. The lesson on letters is still to be taken up in the succeeding quarter and therefore cannot be part of the assessment.

In effect, the content and the assessment have to be blended and synchronized with the curriculum. This decision on the content and the assessment was reached with the class teacher and the master teacher for kindergarten, with the use of a local TV program that is in the mother tongue. Another dimension of the decision is on the number of trials, eventually agreeing on having three trials using three episodes. The assessment has to include questions related to numbers, colors, the ability of the learner to speak several words to describe the content, and, a question on critical thinking: how would the learner do things if she/he were the person in the story.

The results revealed the following:

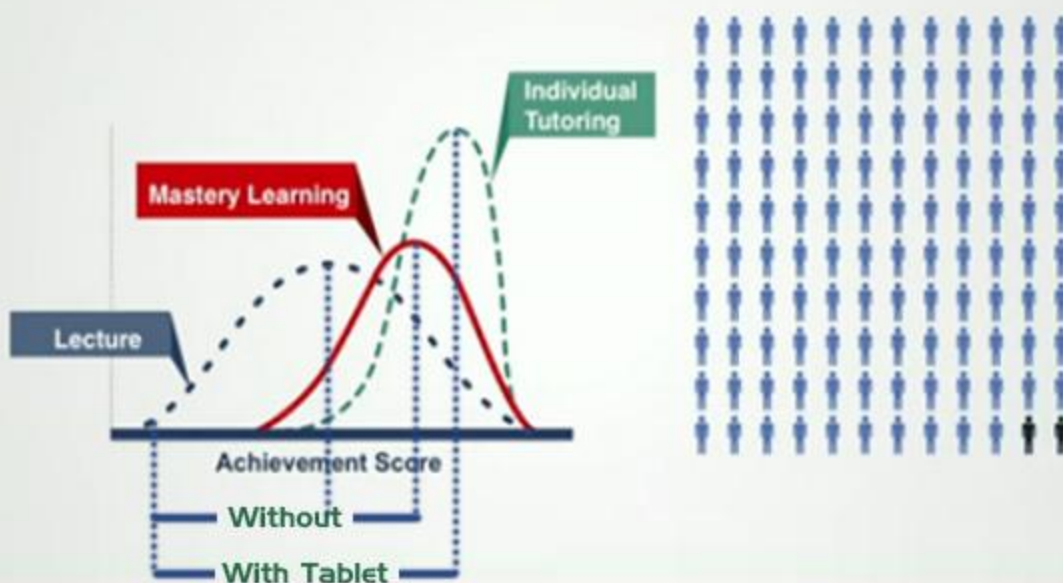


On average, there is a difference in cognitive abilities ranging from a low of 23% to a high of 88% in favor of the learners who use the tablet.

Interim Conclusion

If the use of the tablet is reflective of the pedagogy of one-to-one with a tutor, mentor or teacher, then it has the ability to improve the results of the cognitive domain. The visual representation that best show the comparative result made use of a presentation material from the TED Talk of Dr. Daphne Koller, the co-founder of the MOOC Coursera:

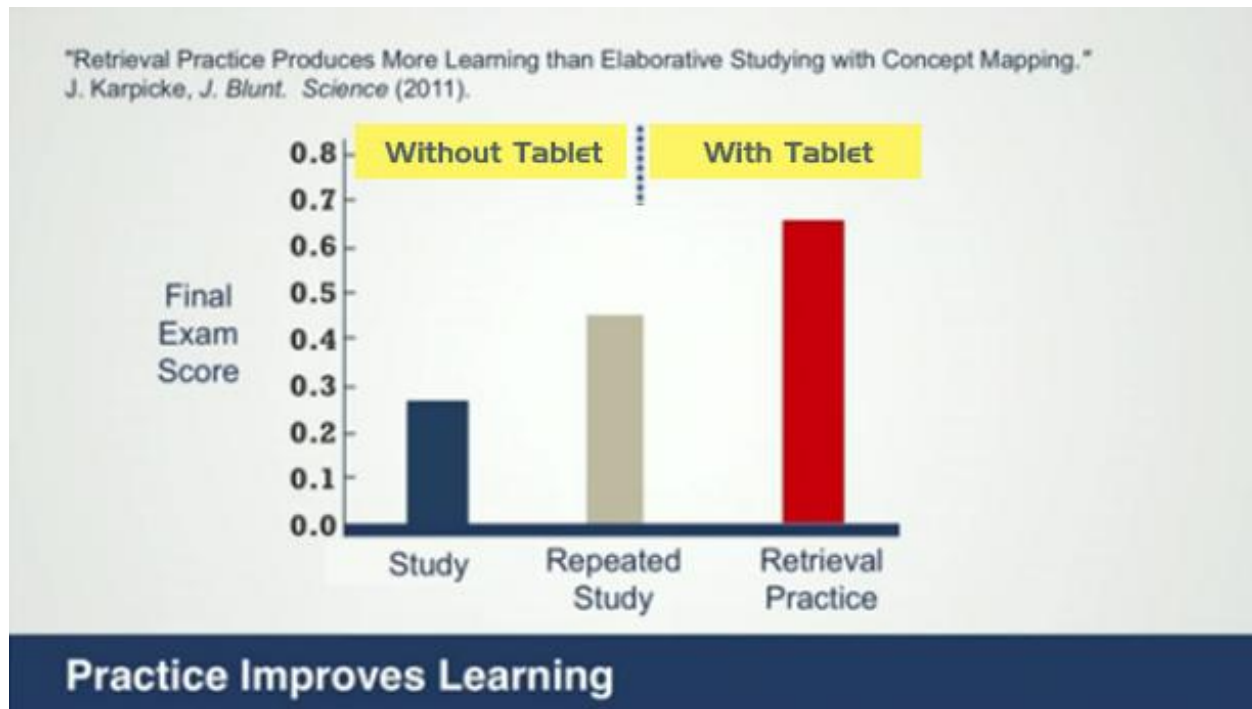
"The 2 Sigma Problem: The Search for Methods of Group Instruction as Effective as One-to-One Tutoring." B. Bloom, *Educational Researcher* (1984).



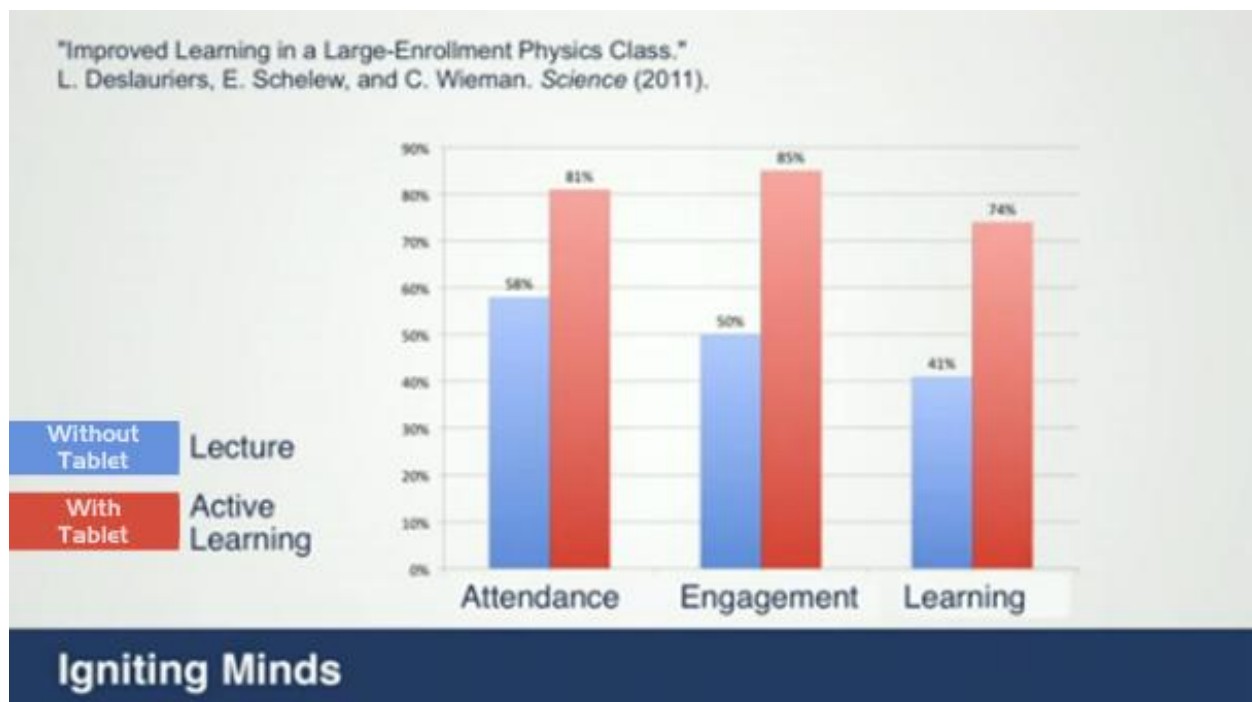
The 2 Sigma Problem

The difference between the mastery learning and individual tutoring is 11%. This increase is quite conservative to the results that have been obtained from this study, the range of 23% to 88%.

By inference, using the same presentation of Dr. Koller, the use of the tablet provided the same opportunity of repeated practice in such skills as drawing of letters and numbers, as well as, repeated replays of games with numbers and letter as the main content and in the mother tongue.



Another inference is made on the presentation of Dr. Koller, on the ability of technology to ignite the mind with the use of the tablet.



Both the two previous slides are only inferences and are therefore two hypotheses that infer that the tablet use and the content that it can deliver maybe to explain increases in favorable learning outcomes.

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