

Running Head: Mass Customized Learning and One to One Computing

ATTITUDES AND PERCEPTIONS ABOUT MASS CUSTOMIZED LEARNING AND ONE  
TO ONE COMPUTING

By

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## ABSTRACT

The purpose of this study was to determine the attitudes and perceptions of mass customized learning and one to one computing within a Midwest suburban school district with two high schools. The study group consisted of teachers at the high schools as well as junior and senior students from the aforementioned high schools. Data in the form of survey responses were compiled and analyzed using chi-square analysis. The research suggests that teachers and students feel that student achievement will increase if the students have accessibility to one to one computing. Findings from this study show the perception that there is a significant increase in student achievement with one to one computing.

## INTRODUCTION

### *Background, Issues, Concerns*

The Midwest school district is concerned with the high amount of money that is spent per child, relative to the rest of the state. Exploring different options as to how LPS can reduce per pupil expenditure, but still have high student achievement, is under constant evaluation.

Neighboring school districts have implemented programs and initiatives that allow their per pupil cost to stay relatively low and student achievement is comparable with LPS. One program option is to equip all students at the secondary level with a computer. Before this program is put into place, careful evaluation should be given to the attitudes and perceptions of teachers and students who would be directly affected.

### *Practice under Investigation*

The practice under investigation was to evaluate the use of one to one computing for students in the secondary schools. An investigation to determine the attitudes and perceptions of students and teachers in regards to one to one computing.

### *School Policy to be Informed by study*

Currently, school policy allows students to bring outside devices into the buildings but limited connectivity to school resources is allowed unless authorization is given by the district technology department. The need to bring personal devices would decrease if the district implemented one to one computing, allowing for easier monitoring and protection of the technology equipment.

### *Conceptual Underpinning*

Students have the ability to access information from cell phones, iPads, computers and many other technological devices for news, education or entertainment purposes. Not all students use or understand the vast capabilities of these devices because of the variety of devices that are available. Providing students with a computer with appropriate programming and training would allow them to grow and learn in a manner that is consistent with the ever changing society. One to one computing could increase student achievement by allowing students to have access to their educational materials twenty four hours a day seven days a week. Students would be able to stay connected with the curriculum by having the computer be an extension of the classroom and allow for students to work and learn at times other than the school day.

### *Statement of the Problem*

To best utilize school resources, accurate information regarding attitudes and perceptions needs to be presented to the cabinet administration and the school board. By providing accurate information it will allow the leaders to allocate appropriate resources and operate in a fiscally responsible manner while ensuring student achievement is not compromised. The problem of this study is to determine the attitudes and perceptions of both teachers and students toward one to one computing.

### *Purpose of the Study*

The purpose of the research study is to evaluate the opinions of students and teachers in reference to one to one computing. Mass customized learning allows students to learn in a personally customized way, different from the traditional school system.

*Research Question(s)*

Is there a difference between teacher and student opinion regarding one to one computing increasing student achievement?

*Null Hypothesis*

There is no difference between teacher and student opinion regarding one to one computing increasing student achievement?

*Anticipated Benefits of the Study*

The benefits of this study will allow building principals and school district officials to evaluate their personnel needs relative to the possibility of using on-line learning as an alternative to the traditional classroom model.

Additional benefits of the study will aid in the development of 9-12 curriculums and allow a more comprehensive review of the amount of money that is spent per student.

*Definition of Terms*

ASP: A Statistical Package

MCL: Mass Customized Learning

*Summary*

A study was conducted to see if there was a significant difference in the opinions of students and teachers on how student achievement would be affected by one to one computing. If the chi-square analysis concludes there was a significant difference, the school district should

take a look at the options of implementing a practice that provided students with their own portable computing device. Society is changing at a rapid pace and education must continue to change with the world to help prepare students for the ever changing society they will enter as working adults.

## REVIEW OF LITERATURE

The iPad has been a wildly popular item sold by Apple. As people go and purchase the device, they all would purchase the same device. However, once it is in their possession is when the real customization takes place. Apple's design of the iPad fits the demand of society, which requires personalization and customization. Perhaps there is no more important organization or system than the education system, but it currently lags behind in being creative, innovative and personal. "Adaptation of mass customization concepts in education holds the promise of preparing human resources needed in the 'new' evolving society, in a humanistic, interesting and cost-effective manner." (Sokolov, 2001, p. 205)

Young people are always looking for ways to learn. The manner in which students were taught in the classroom in the mid 1970's might not be as applicable today. "The advantages for students are potentially more compelling, given the widespread enthusiasm among young people for using technology to create and consume media" (Manzon, 2010, p. 20). Student learning is going to take place in schools, but how student learning takes place is a topic for debate. With the excitement and knowledge that students have about technology in today's society, it is important for districts to capitalize on it and use it as a daily resource to help students grow and mature.

In education and in life "change is the only constant." (White & Greenwood, 2004, p. 42). It is important for school districts, especially at the secondary level, to make the necessary changes to help prepare young adults as they enter their post-secondary career options. "An education and a curriculum tailored to the needs and abilities of each student is absolutely critical to the future of education and our society" (Worzel, 2010, p. 5). Just as the iPad is customized, all students should have the ability to have their educational needs met in the most personalized

way. Mass customized learning allows “a completely different paradigm of education, one that is customized to meet each student’s needs and potential” (Reigeluth, 2010, p. 84). Meeting the needs of the student is critical not only to student achievement in school, but future achievement in careers.

A similar study to the one that is conducted in this paper was done by a group, ProjectRED. The hypothesis that properly implemented technology initiatives could increase student achievement was proven to be correct (One-to-One Institute, 2012). Not only did the schools who implemented this outperform other schools, but there was opportunity to improve return on investment (One-to-One Institute, 2012). With all of these items being true, the shift that has to take place requires “a different role for teachers, students, and, yes, technology” (Reigeluth, 2010, p. 84). Instead of technology being a processing system for students to type papers that an English teacher provided the instruction for, technology may be providing the instruction as well as allowing the processing to take place. “Rather than integrating technology into the classroom, we should be using technology to transform what goes on in the classroom.” (Reigeluth, 2010, p. 84)

Students do not just learn during the time that they attend school. If student achievement is ultimately one of the high priorities of educators, then it should not be limited to the time frame that students are in schools. Providing technology that has on-line resources would allow students to learn in different settings than school. “We will then be linking the educational environment to the learning that takes place within that environment” (Pesaneli, 2005, p. 61). The best learning environment for some students might be their bedroom with their computer, while for others it might be the school library. Providing students with choices will allow them to be more invested in their own personal learning. “Mass customized education is not based on



frontal teaching, and can therefore be suited to the student's most convenient time" (Sokolov, 2001, p. 201). Once the student leaves their math course, their ability to learn math should not be taken away from them. A customized education program that provides students tools and accessibility to curriculum is imperative to high student achievement. "The use of technology in education should be based on what we know about how students learn best and how we can best facilitate that learning" (Reigeluth, 2010, p. 84).

Leaders of organizations, including school districts, often talk about being able to provide a sustainable program. Student achievement is a high priority, but preparing students for post-secondary careers is also an important part of today's educators, "in a world where social skills are permanent but the knowledge base is ever shifting" (Sokolov, 2001, p. 205). The options that on-line learning provide expands the possibilities of course work for the students. "Distance education has enjoyed a rapid growth in the United States in recent years and continues to expand." (Saba, 2005, p. 255) With the continuing expansion of distance education and on-line learning, it is important for districts to find where they fit in the growing trend. There are many fantastic school districts that are doing good things. Distance education and on-line learning will allow those districts to go from good to great as mass customized learning and one to one computing allow school districts to personally connect with each individual student.

## RESEARCH METHODS

### *Research Design*

A Chi-Square analysis was conducted to find the attitudes and perceptions of one to one computing. The independent variable was whether the person responded to the survey as a teacher or a student. The dependent variable was a yes or no answer to the statement given in the survey.

### *Study Group Description*

Teachers from two local high schools as well as junior and seniors students of both buildings were the individuals studied. The suburban high school has 11,078 students attending grades K-12. 84.6% of the students are white, the next biggest population is African American, which is 5.9%. 20.3% are Free/Reduced lunch students.

### *Data Collection and Instrumentation*

An email survey was distributed to teachers at both high school buildings. The survey was distributed via email on November 15<sup>th</sup> and final data collection was pulled from the document on November 20<sup>th</sup>. In addition to the teachers, students who are juniors or seniors at both buildings were also emailed the survey to complete through a Google document.

### *Statistical Analysis Methods*

To analysis the data, a Google form was created and data was directly entered by the teachers and students and captured within the author's student email account provided by the school district. Once that data was provided, it was exported to Microsoft Excel. Data was recoded while in Microsoft Excel to the specifications needed for ASP. While using ASP, a

frequency plot, Chi-Square analysis as well as a cross tab contingency matrix was used to get accurate data.

FINDINGS

To determine the attitudes and perceptions of teachers and students, all respondents were required to answer a question that identified themselves as either a teacher or a student.

FIGURE 1

VARIABLE: I am responding as

	FRQ.	CUM.	%	CUM.	FREQUENCY PLOT
x < 1	0	0	0	0	
x = 1	153	153	28.6	28.6	*****
x = 2	382	535	71.4	100	*****
x > 2	0	535	0	100	
TOTAL	535		100		

Key for plot #1= Teacher #2= Student

Total Respondents = 535

Number of Teachers = 153

Teachers are 28.6 % of respondents

Number of Students = 382

Students are 71.4 % of respondents

As shown in FIGURE 1, 535 responses were recorded. Of those responses, 153 were teachers responding, while 382 were students responding. 71.4% of the respondents were from students as compared to 28.6% of the responses are from teachers.

FIGURE 2-1

Research Question #1

VARIABLE: One to one computing will increase student achievement?

	FRQ.	CUM.	%	CUM.	FREQUENCY PLOT
x < 1	0	0	0	0	
x = 1	440	440	82.2	82.2	*****
x = 2	95	535	17.8	100	*****
x > 2	0	535	0	100	
<b>TOTAL</b>	<b>535</b>		<b>100</b>		

**Key for plot #1=Yes #2= No**

**Frequency of #1 = 440 Percentage of #1 = 82.2%**

**Frequency of #2 = 95 Percentage of #2 = 17.8%**

The research question, which was phrased as a statement, showed 440 of the respondents thought that the statement “one to one computing will increase student achievement” was correct and chose yes as their answer. 95 of the respondents answered no to the statement, one to one computing would increase student achievement. 82.2% of the respondents said yes, compared to 17.8% of the respondents who said no.

FIGURE 2-2 – Bar graph comparing Yes/NO responses

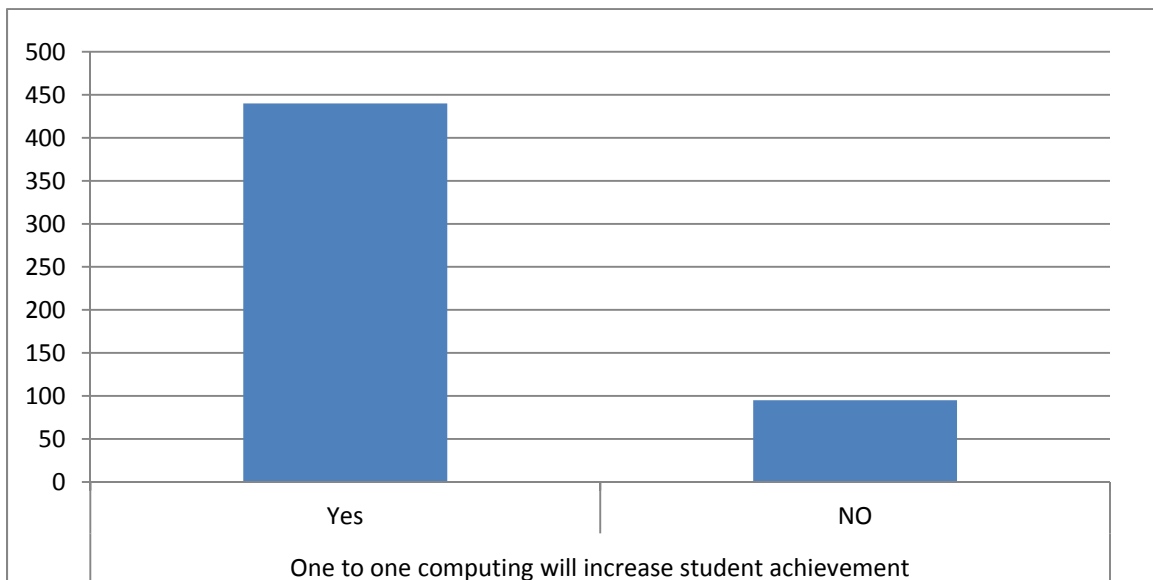


Figure 2-3 – Pie Chart comparing Yes/No responses

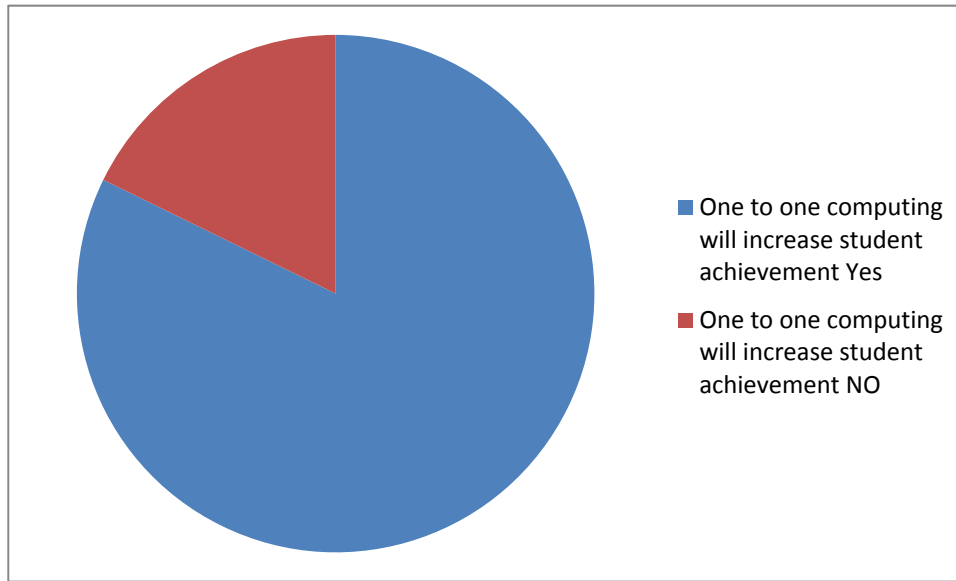


FIGURE 3

Table 1					
Summary of Chi Square Analysis					
Source	Teachers	Students	Chi Sq	df	p-value
Yes	73.2% (112)	85.9% (328)			
No	26.8% (41)	14.1% (54)	11.99	1	0.53E-3
Sign = or < 0.25					

**The p-value is 0.000534338 or 0.53 E-3      The alpha level is 0.25**

**The null hypothesis is rejected**

**The conclusion is there is a significant difference.**

Teachers favor one to one computing 73.2% over 26.8% when comparing their responses. Students, they favor one to one computing 85.9% to 14.1%. There are more students than teachers who responded to this survey, but the percentage of students who say that one to one computing would increase student achievement is 10% higher than the percentage of teachers who responded to the survey. When completing the cross tab contingency matrix, a significant difference is shown therefore the null hypothesis “one to one computing will not increase student achievement” is rejected. Both students and teachers were of the opinion that one to one computing would increase student achievement. While both were of the opinion, significantly more students than teachers thought one to one computing would increase achievement.

## CONCLUSIONS AND RECCOMENDATIONS

The results of the research show there is a significant difference as to the opinion of one to one computing being able to help increase student achievement. The null hypothesis, one to one computing will not increase student achievement, should be rejected because the data points out that there is a significant difference. Receiving 535 responses shows an active participation amongst the teachers and students who were surveyed, further adding to the validity of the study. As stated in conceptual underpinning, students who have access to one to one computing are better equipped to handle careers in an ever changing technological society. Teachers overall opinion of one to one computing showed a favorable response, with 73.2% of the 112 respondents agreeing that one to one computing would increase student achievement. Students were significantly in favor of one to one computing. Of the 328 surveyed, 85.9% were in favor of one to one computing. With the perception of a significant amount of students in favor of one to one computing the students are showing an opinion that there learning and achievement would increase with one to one computing. The perception of student achievement increasing is a very important piece because it has the opportunity to make the students apply themselves and is therefore more likely to help students learn.

LPS should conduct an in-depth analysis at the possibility of becoming a one to one student to computer school district at the secondary level. A team from LPS should two local places who have recently instituted this practice. During these visits the team should analyze the cost of implementation of such a program as well as the potential savings in eliminating textbooks and other more traditional classroom resources in favor of some 21<sup>st</sup> century items. Additional access and flexibility of coursework should also be studied by the assembled team Included on this team should be a member of the cabinet administration, director of technology,



building principals, two to three high school level teachers and a member or two of the board of education.

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