Michigan's K-12

Virtual Learning Effectiveness Report

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Michigan Virtual Learning Research INSTITUTE™

A Division of MVU

About Michigan Virtual Learning Research Institute

In 2012, the Governor and Michigan Legislature passed legislation requiring the *Michigan Virtual University*® (*MVU*®) to establish a center for online learning research and innovation, and through this center, directed *MVU* to work on a variety of projects. The center, known formally as the *Michigan Virtual Learning Research Institute*™ (*MVLRI*™), is a natural extension of the work of *MVU*. Established in 1998, *MVU*'s mission is to serve as a catalyst for change by providing quality Internet-based programs that strengthen teaching and learning for K-12 education. Toward that end, the core strategies of *MVLRI* are:

- Research — Expand the K-12 online and blended learning knowledge base through high-quality, high-impact research;
- Policy — Inform local, state, and national public education policy strategies that reinforce and support online and blended learning opportunities for the K-12 community;
- Innovation — Experiment with new technologies and online learning models to foster expanded learning opportunities for K-12 students; and
- Networks — Develop human and web-based applications and infrastructures for sharing information and implementing K-12 online and blended learning best practices.

MVU dedicates a small number of staff members to *MVLRI* projects as well as augments its capacity through a Fellows program drawing from state and national experts in K-12 online learning from K-12 schooling, higher education, and private industry. These experts work alongside *MVU* staff to provide research, evaluation, and development expertise and support.

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Front Matter

ABSTRACT

Based on pupil completion and performance data reported by school entities to the Michigan Department of Education (MDE) or the Center for Educational Performance and Information (CEPI), this report highlights enrollment totals, completion rates, and the overall impact of virtual courses on K-12 pupils. Through this report, the authors sought to 1) expose and explore the variability that exists in the use of and performance in virtual courses and 2) develop a more nuanced understanding of K-12 virtual learning in the state of Michigan. Statistics shared in the report must be interpreted with care due to concerns about the accuracy of data reported to the state about virtual enrollments during the first three years of its collection. Findings include an apparent growth in the number of students and schools participating in virtual courses, with the majority of virtual enrollments coming in the core subject areas. Students taking virtual courses in a supplemental capacity appear to be more successful when they take only a few virtual enrollments a year. Developing practices to better support students who take higher amounts of virtual enrollments should be a priority.

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DISCLOSURE

Please note that the *Michigan Virtual University* is the parent organization of both the *Michigan Virtual School* and the *Michigan Virtual Learning Research Institute*.

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Introduction

OVERVIEW

MVU was asked by the Legislature through Public Act 201 of 2012 to use data reported to the Michigan Department of Education (MDE) or Center for Educational Performance and Information (CEPI) to analyze the effectiveness of online delivery models. Specifically, Public Act 201 states:

> *Based on pupil completion and performance data reported to the department [MDE] or the Center for Educational Performance and Information [CEPI] from cyber schools and other online course providers operating in this state, analyze the effectiveness of online learning delivery models in preparing pupils to be college- and career-ready and publish a report that highlights enrollment totals, completion rates and the overall impact on pupils. The report shall be submitted to the house and senate appropriation subcommittees on state school aid, the state budget director, the house and senate fiscal agencies and the department not later than December 31, 2013.*

This report presents final findings from this project. Initial findings were submitted in December 2013.

BACKGROUND

The question of whether online learning is as good as face-to-face learning has existed for some time. Researchers have reported conflicting conclusions; some have found positive effects for face-to-face conditions while others have found better results for online learners. A couple of important meta-analyses have been published that offer a quantitative synthesis of the K-12 online learning literature, allowing for a better understanding of effectiveness across multiple studies. In 2005, Cavanaugh, Gillian, Kromrey, Hess, and Blomeyer[1] examined 116 effect sizes from 14 K-12 web-delivered distance education programs and found the results to be as effective as classroom instruction. Due to the number of studies in the meta-analysis, the researchers pointed out that the results should be interpreted as providing "indications of tendencies rather than prescriptions of practice" (p. 16).

In 2010, Means et al.[2] conducted a meta-analysis on research articles published between 1996 and July 2008. The researchers identified over a thousand empirical studies dealing with online learning (both within K-12 and beyond) and used the following criteria to narrow the publications used in their study:

> a) contrasted an online to a face-to-face condition,
>
> b) measured student learning outcomes,
>
> c) used a rigorous research design, and
>
> d) provided adequate information to calculate an effect size (p. ix).

Their meta-analysis included 50 independent effects from which the researchers concluded that "on average, students in online learning conditions performed modestly better than those receiving face-to-face instruction" (p. ix). However, like Cavanaugh et al., they, too, recommended caution be used in generalizing to K-12 populations since the majority of the effects came from higher education.

Finally, Means, Toyama, Murphy, and Bakia (2013)[3] recently published an article from the same research effort as their 2009 publication restating their finding that "purely online learning has been equivalent to face-to-face instruction in effectiveness, and blended approaches have been more effective than instruction offered entirely in face-to-face mode"(p. 35). Like Clark (1983), the authors resist the idea that the medium itself is responsible for the outcomes, but rather see it as "the combination of elements in the treatment conditions, especially the inclusion of different kinds of learning activities, that has proved effective across studies" (p. 36). It is from this perspective that researchers like Ferdig (2011)[4] resist the temptation to approach effectiveness from the standpoint of a dichotomous yes or no question, instead advocating for asking "under what conditions is online learning effective?"

Introduction

Toward this aim, *MVU* developed several research questions which sought to 1) expose and explore the variability that exists (for instance in student performance or by gender, poverty, subject area, etc.) and 2) develop a more nuanced understanding of online learning in the state of Michigan. Instead of employing quasi-experimental research methods designed to compare groups, this study used descriptive data drawn from MDE and CEPI to, for the first time, describe the variability of online learning in the state.

DATA COLLECTION AND SHARING

MVU worked with MDE and CEPI to develop a memorandum of understanding to exchange data for the analyses to be conducted. These rich data sets – combining information from the Michigan Student Data System, the Educational Entity Master (EEM), the Michigan Student Data System Teacher-Student Data Link (TSDL), MDE Test Scores Database, and a list of *Michigan Virtual School®* (*MVS®*) students – included over a million enrollment records and allowed for a range of analyses to be conducted.

Enrollment records from three student subsets were drawn from:

1) Michigan students who took at least one online course with *MVS*. *MVS* is a state-supported supplementary virtual school program that was created by Public Act 230 of 2000;

2) Michigan students who attended a cyber school. Cyber schools provide full-time instruction through online learning. Cyber schools were first created through Public Act 205 of 2009. Public Act 129 of 2012 expanded the number of cyber school contracts that could be issued in the state; and

3) Michigan students who had taken at least one virtual course. Virtual course providers for students in this subset ranged from district-created solutions to non-*MVS* third party offerings.

Data records that met the above inclusion criteria for the 2010-11, 2011-12, and 2012-13 school years were identified and shared with *MVU*.

DATA CONCERNS

Readers of this report should exercise caution when interpreting findings. *MVU* believes that the accuracy of the virtual delivery flag tied to student enrollments through the TSDL is less than optimal. *MVU* bases this conclusion on a couple of findings. First, the TSDL began in 2010, and the data in this report came from data collected by the state and was reported by districts from these initial years. Second, a large number of students known to have taken online courses with *MVS* had zero enrollments flagged by their schools as being delivered virtually. Third, searches for phrases such as "virtual" or "online" or those that included common online provider names in the local course title field revealed thousands of enrollments that were not marked as having been delivered virtually. While it is possible that the virtual flag setting is more accurate than the local course title field, we do not believe that possibility is likely. For this reason, the research team adjusted the virtual flag data for enrollments where analysis of the local title provided reason to suggest they were delivered virtually.

The lack of known virtual students having enrollments marked as being delivered virtually and the disconnect between local title information and the virtual flag information suggests there is likely considerable underreporting of virtual coursework. Since the collection of this variable by the state has only taken place for a few years, *MVU* expects that through increased attention and training, data accuracy is likely to improve in subsequent years.

RESEARCH CATEGORIES

For this report, findings are included that address each of the three categories requested by the legislature: pupil and enrollment totals, completion rates, and overall impact. Please note that in some tables and figures, the percentage data may not sum to 100% due to rounding.

Pupil and Enrollment Totals

PUPIL AND ENROLLMENT TOTALS

Based on data reported to the state for the 2012-13 school year, the number of Michigan K-12 students taking a virtual course has grown steadily over the past three years. As mentioned in the Data Concerns section above, these counts likely reflect underreporting given the data accuracy concerns.

Table 1. Count of Michigan K-12 Students Taking a Virtual Course by Grade Level and School Year

Grade Level	School Year		
	2010-11	2011-12	2012-13
K	78	171	175
1	76	206	199
2	88	196	273
3	92	212	206
4	140	173	213
5	145	180	291
6	356	609	744
7	616	857	1,155
8	1,384	1,760	2,259
9	4,359	6,749	7,661
10	7,848	11,369	12,101
11	8,595	11,885	12,061
12	12,706	18,173	18,286
Total	**36,348**	**52,219**	**55,271**

Note: Because some students took courses across multiple grade levels for a single year, an individual student may be counted toward more than one grade level for a given school year. The total row, however, reflects the number of unique students for the year, and therefore may differ from the number one would get by summing the rows.

According to the data, 185,053 K-12 course enrollments were delivered virtually in 2012-13. The 2012-13 count is more than twice the number reported for the 2010-11 school year. This discrepancy may expand as schools also have the ability to continue to report summer enrollment data during the next data collection cycle.

Table 2. Count of Michigan K-12 Virtual Course Enrollments by Grade Level and School Year

Grade Level	School Year		
	2010-11	2011-12	2012-13
K	150	550	541
1	224	825	682
2	154	807	1,037
3	238	788	1,193
4	352	785	1,176
5	275	909	1,511
6	1,084	1,689	3,170
7	1,492	2,980	4,868
8	2,453	4,697	7,267
9	10,734	17,654	23,262
10	19,589	34,016	40,604
11	20,830	33,194	38,111
12	32,346	54,689	61,631
Total	**89,921**	**153,583**	**185,053**

Pupil and Enrollment Totals

Around 90% of the virtual enrollments each year came from students in grades 9-12. This number may be trending down a bit – it was about 93% in 2010-11, 91% in 2011-12, and 88% in 2012-13; however, given the reservations about the accuracy of the data reported and incompleteness of the 2012-13 summer data, the research team is resistant to drawing definitive conclusions.

As evidenced by Table 3, virtual enrollments during the last three years occurred in each of the subject areas recorded by the state. Mathematics consistently accounted for the largest percentage of virtual enrollments with approximately 20% of virtual enrollments each of the past three years. Other core subjects like English Language and Literature, Social Sciences and History, and Life and Physical Sciences, as well as Miscellaneous were other subject areas that equaled or exceeded 10% of the virtual enrollments for a school year.

Table 3. Count and Percentage of Michigan K-12 Virtual Course Enrollments by Subject Area and School Year

	School Year					
	2010-11		2011-12		2012-13	
Subject Area	**# of Enrolls**	**% of Enrolls**	**# of Enrolls**	**% of Enrolls**	**# of Enrolls**	**% of Enrolls**
Agriculture, Food and Natural Resources	31	0%	<10	0%	45	0%
Architecture and Construction	12	0%	88	0%	147	0%
Business and Marketing	736	1%	1,533	1%	2,030	1%
Communication and Audio/Visual Technology	291	0%	624	0%	1,151	1%
Computer and Information Sciences	2,196	2%	5,252	3%	5,851	3%
Engineering and Technology	409	0%	535	0%	940	1%
English Language and Literature	15,788	18%	29,011	19%	33,697	18%
Fine and Performing Arts	2,148	2%	4,411	3%	5,819	3%
Foreign Language and Literature	2,980	3%	5,157	3%	7,023	4%
Health Care Sciences	244	0%	1,140	1%	1,545	1%
Hospitality and Tourism	<10	0%	161	0%	236	0%
Human Services	83	0%	47	0%	109	0%
Life and Physical Sciences	13,117	15%	22,059	14%	27,001	15%
Manufacturing	<10	0%	21	0%	<10	0%
Mathematics	18,747	21%	32,712	21%	36,259	20%
Military Science	<10	0%	<10	0%	-	-
Miscellaneous	11,161	12%	13,808	9%	18,948	10%
Nonsubject Specific	480	1%	1,051	1%	1,327	1%
Physical, Health and Safety Education	3,990	4%	7,848	5%	10,063	5%
Public, Protective, and Government Service	55	0%	277	0%	423	0%
Religious Education and Theology	<10	0%	<10	0%	<10	0%
Social Sciences and History	16,907	19%	27,208	18%	31,438	17%
State Approved CTE Course	516	1%	182	0%	619	0%
Transportation, Distribution and Logistics	20	0%	443	0%	366	0%
Total	**89,921**	**100%**	**153,583**	**100%**	**185,053**	**100%**

Note: Enrollment counts for subject areas included both secondary (9-12) and prior-to-secondary (K-8) enrollments. Cells with low enrollment counts are displayed as <10 to address student confidentiality concerns.

Despite the diversity of subject areas in which students were enrolled, virtual enrollments were concentrated in the core subject areas of English Language and Literature, Life and Physical Science, Mathematics, and Social Studies and History. This may reflect the use of virtual courses for credit recovery purposes, but may also reflect a gravitation toward these subjects even for elective coursework. Deeper analysis in this area is recommended for next year's report as the data needed to investigate further was not asked for by the research team as part of the MOU.

Table 4 on page 5 includes subject area data on the count and percentage of males and females enrolling in virtual coursework each year. For the most part, there is little difference in the percentage of males and females enrolling in virtual courses within a particular subject area.

Pupil and Enrollment Totals

Table 4. Count and Percentage of Michigan K-12 Virtual Course Enrollments by Subject Area, School Year, and Gender

Subject Area	School Year											
	2010-11				2011-12				2012-13			
	#M	#F	%M	%F	#M	#F	%M	%F	#M	#F	%M	%F
Agriculture, Food and Natural Resources	18	13	0%	0%	<10	<10	0%	0%	17	28	0%	0%
Architecture and Construction	<10	<10	0%	0%	88	0	0%	0%	<147	<147	0%	0%
Business and Marketing	365	371	1%	1%	741	792	1%	1%	949	1,081	1%	1%
Communication and Audio/Visual Technology	138	153	0%	0%	265	359	0%	0%	549	602	1%	1%
Computer and Information Sciences	1,274	922	3%	2%	3,127	2,125	4%	3%	3,299	2,552	3%	3%
Engineering and Technology	221	188	0%	0%	371	164	0%	0%	692	248	1%	0%
English Language and Literature	8,866	6,922	19%	16%	15,910	13,101	19%	18%	18,134	15,563	19%	18%
Fine and Performing Arts	1,007	1,141	2%	3%	2,152	2,259	3%	3%	2,720	3,099	3%	3%
Foreign Language and Literature	1,245	1,735	3%	4%	2,247	2,910	3%	4%	3,046	3,977	3%	4%
Health Care Sciences	76	168	0%	0%	421	719	1%	1%	393	1,152	0%	1%
Hospitality and Tourism	<10	<10	0%	0%	105	56	0%	0%	110	126	0%	0%
Human Services	25	58	0%	0%	17	30	0%	0%	27	82	0%	0%
Life and Physical Sciences	7,122	5,995	15%	14%	12,071	9,988	15%	14%	14,302	12,699	15%	14%
Manufacturing	<10	<10	0%	0%	<21	<21	0%	0%	<10	<10	0%	0%
Mathematics	10,214	8,533	21%	20%	17,999	14,713	22%	20%	19,313	16,946	20%	19%
Military Science	<10	<10	0%	0%	<10	<10	0%	0%	0	0	0%	0%
Miscellaneous	5,732	5,429	12%	13%	6,931	6,877	8%	10%	9,774	9,174	10%	10%
Nonsubject Specific	266	214	1%	1%	539	512	1%	1%	711	616	1%	1%
Physical, Health and Safety Education	2,001	1,989	4%	5%	3,998	3,850	5%	5%	5,097	4,966	5%	6%
Public, Protective, and Government Service	23	32	0%	0%	152	125	0%	0%	208	215	0%	0%
Religious Education and Theology	<10	<10	0%	0%	<10	<10	0%	0%	<10	<10	0%	0%
Social Sciences and History	8,748	8,159	18%	19%	13,987	13,221	17%	18%	16,082	15,356	17%	17%
State Approved CTE Course	281	235	1%	1%	89	93	0%	0%	299	320	0%	0%
Transportation, Distribution and Logistics	20	0	0%	0%	<443	<443	1%	0%	<366	<366	0%	0%
Total	**47,654**	**42,267**	**100%**	**100%**	**81,667**	**71,916**	**100%**	**100%**	**96,237**	**88,816**	**100%**	**100%**

Note: Enrollment counts for subject areas included both secondary and prior-to-secondary enrollments. Cells with low enrollment counts are displayed as <[#] to address student confidentiality concerns. Suppressed cells with larger values (e.g, <147, <366) correspond to the data presented in Table 3 above. M = Males. F = Females.

Similarly, Table 5 on page 6 presents data on the percentages of enrollments in each subject area according to the locale (rural, town, suburb, or city) in which the school is located. It appears as though the percentages are fairly consistent across locales as well as across school years. The largest variation observed in the 2012-13 school year seems to exist in the Miscellaneous (5% difference between town and rural locales) and Mathematics (6% difference between suburbs and towns) subject areas.

Pupil and Enrollment Totals

Table 5. Percentage of Michigan K-12 Virtual Course Enrollments by Subject Area, School Year, and Locale

Subject Area	School Year											
	2010-11				2011-12				2012-13			
	Rural	Town	Sub	City	Rural	Town	Sub	City	Rural	Town	Sub	City
Agriculture, Food and Natural Resources	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Architecture and Construction	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Business and Marketing	1%	1%	1%	0%	1%	2%	1%	1%	1%	2%	1%	1%
Communication and Audio/Visual Technology	0%	1%	0%	0%	0%	1%	0%	0%	0%	1%	0%	0%
Computer and Information Sciences	4%	4%	2%	1%	4%	4%	2%	4%	4%	4%	2%	2%
Engineering and Technology	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%
English Language and Literature	15%	18%	18%	19%	17%	16%	20%	19%	16%	17%	19%	18%
Fine and Performing Arts	3%	1%	1%	4%	3%	2%	2%	2%	3%	3%	2%	2%
Foreign Language and Literature	5%	5%	2%	2%	5%	5%	2%	3%	5%	5%	4%	3%
Health Care Sciences	0%	1%	0%	0%	0%	0%	1%	2%	0%	0%	0%	1%
Hospitality and Tourism	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Human Services	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Life and Physical Sciences	13%	12%	17%	14%	14%	14%	14%	14%	15%	14%	14%	14%
Manufacturing	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Mathematics	19%	17%	23%	22%	19%	19%	24%	22%	19%	18%	24%	19%
Military Science	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Miscellaneous	14%	20%	12%	9%	11%	14%	9%	7%	10%	15%	11%	12%
Nonsubject Specific	0%	0%	0%	2%	0%	0%	0%	3%	0%	0%	0%	4%
Physical, Health and Safety Education	5%	3%	4%	5%	6%	5%	5%	3%	6%	4%	5%	5%
Public, Protective, and Government Service	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%
Religious Education and Theology	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Social Sciences and History	18%	16%	19%	20%	17%	19%	19%	17%	18%	18%	17%	17%
State Approved CTE Course	1%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Transportation, Distribution and Logistics	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Note: Enrollment counts for subject areas included both secondary and prior-to-secondary enrollments. Enrollments that did not include locale information (46,852 for 2012-13, 22,605 for 2011-12, and 3,058 for 2010-11) were not included in the table.

The data indicate that the number of virtual enrollments per school entity varies considerably. For instance, in 2012-13, 40% of schools that had students enrolled in virtual courses reported 100 or more enrollments (see Table 6 on page 7). The second most likely grouping, however, was that the school had less than 10 virtual enrollments for the year – something reported by 25% of the entities. What is also interesting about Table 6 is that while the number of entities with students taking virtual courses continues to grow – from 625 in 2010-11 to 850 in 2011-12 to 906 in 2012-13 – the percentage of entities in each enrollment count group seems to be fairly stable. That is, the percentage of schools that reported 1 to 9 virtual enrollments for the year went from 23% in 2010-11 to 25% in 2012-13. Schools reporting 100+ virtual enrollments went from 35% in 2010-11 to 40% in 2012-13. The research team cautions again, however, not to make too much of this finding due to the data reporting concerns.

Pupil and Enrollment Totals

Table 6. Count and Percentage of Michigan K-12 Virtual Course Enrollments by School Total and School Year

# of Virtual Enrollments per School	School Year					
	2010-11		2011-12		2012-13	
	# of Entities	% of Entities	# of Entities	% of Entities	# of Entities	% of Entities
1 to 9	153	23%	196	23%	228	25%
10 to 19	55	8%	76	9%	70	8%
20 to 29	59	9%	51	6%	60	7%
30 to 39	37	6%	47	6%	32	4%
40 to 49	28	4%	30	4%	30	3%
50 to 59	22	3%	29	3%	36	4%
60 to 69	21	3%	28	3%	22	2%
70 to 79	19	3%	14	2%	22	2%
80 to 89	15	2%	20	2%	25	3%
90 to 99	14	2%	19	2%	17	2%
100+	231	35%	340	40%	364	40%
Total	**654**	**100%**	**850**	**100%**	**906**	**100%**

As may have been anticipated, entities with larger numbers of enrollments tended to come from cities and suburbs (see Table 7). This seems sensible given the likelihood of larger numbers of students per school entity.

Table 7. Percentage of Michigan K-12 Virtual Course Enrollments by Entity Total, School Year, and Locale

# of Virtual Enrollments per School	School Year											
	2010-11				2011-12				2012-13			
	Rural	Town	Sub	City	Rural	Town	Sub	City	Rural	Town	Sub	City
1 to 24	41%	33%	29%	31%	37%	41%	30%	38%	37%	40%	34%	31%
25 to 49	19%	12%	13%	9%	17%	8%	10%	10%	13%	8%	8%	13%
50 to 74	9%	13%	10%	3%	8%	6%	9%	4%	10%	6%	8%	7%
75 to 99	8%	4%	6%	1%	7%	5%	2%	4%	6%	6%	5%	5%
100+	24%	38%	43%	55%	31%	39%	49%	44%	34%	40%	45%	45%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Note: Enrollments that did not include locale information (46,852 for 2012-13, 22,605 for 2011-12, and 3,058 for 2010-11) were not included in the table.

Completion Rates

COMPLETION RATES

When examining the completion rate tables in this section, please keep in mind that "Completed/Passed" status may be somewhat misleading. Consider, for instance, the completion status of "Audited (No Credit Issued)." As is evident in Table 8, 5% of the virtual enrollments for the 2012-13 school year fell into that category. These virtual enrollments are not "failures;" yet if these 8,756 enrollments are included in the total counts for calculating completion rates, it lowers the percentage of each of the other completion statuses including the virtual enrollments that were marked as "Completed/Passed."

Another complicating factor is the fact that the data may not present the entire picture of virtual courses taken over the summer. To illustrate, consider that one school that uses *MVS* had over 500 enrollments marked as "Incomplete." Upon closer inspection, almost all of these enrollments represent summer enrollments. In looking at *MVS* records, the final grades for those enrollments suggest the majority of these enrollments will result in "Completed/Passed" statuses when the final summer data is reported, yet at present they count against the percentage of "Completed/Passed" by inflating the percentage of "Incomplete" published below.

Finally, it is unclear how to best treat enrollments with a Withdrawn status. For instance, 3% of the virtual enrollments in 2012-13 were marked as "Withdrawn/Passing," meaning that the student was passing the course at the time the student was withdrawn. Should these enrollments be counted as failures that should be taken into account in completion rate formulas? What about students whose enrollments were marked as "Withdrawn/Exited?" There is no way to determine whether that exiting occurred in the first few weeks of class or the final weeks of class. The data do not provide insight into whether the student was reenrolled in a different course or whether it was too late for reenrollment in a credit-bearing opportunity for the student.

The research team raises these issues because they represent questions that the team discussed, but for which there are no definitive answers. In the end, the team decided to present the data as is, providing readers with the entire data picture to draw their own conclusions and own formulas for calculating completion rates.

Table 8 is illustrative of the challenge with the completion data. Table 8 shows that the percentage of virtual course enrollments that were marked as ending in a "Completed/Passed" status has hovered in the mid-to-low 60s for the past three years.

Table 8. Count and Percentage of Michigan K-12 Virtual Course Enrollments by Completion Status

	School Year					
	2010-11		2011-12		2012-13	
Completion Status	# of Enrolls	% of Enrolls	# of Enrolls	% of Enrolls	# of Enrolls	% of Enrolls
Audited (No Credit Issued)	363	0%	4,858	3%	8,756	5%
Completed/Failed	17,562	20%	26,159	17%	23,644	13%
Completed/Passed	59,654	66%	94,654	62%	111,811	60%
Incomplete	3,588	4%	8,524	6%	15,471	8%
Testing Out	22	0%	126	0%	93	0%
Withdrawn/Exited	5,505	6%	11,030	7%	16,075	9%
Withdrawn/Failing	1,687	2%	4,412	3%	3,047	2%
Withdrawn/Passing	1,540	2%	3,820	2%	6,156	3%
Total	**89,921**	**100%**	**153,583**	**100%**	**185,053**	**100%**

Whereas Table 8 shows completion status outcomes for virtual courses, for comparison purposes, Table 9 on page 9 shows the completion status for the non-virtual enrollments from this same population of students (those who had taken at least one virtual course). Whereas the percentage of "Completed/Passed" in virtual courses was in the low 60s, Table 9 shows their non-virtual coursework percentage to be in the mid-to low-70s.

Completion Rates

Table 9. Count and Percentage of Michigan K-12 Non-Virtual Course Enrollments for Students Enrolled in at Least One Virtual Course by Completion Status

	School Year					
	2010-11		2011-12		2012-13	
Completion Status	# of Enrolls	% of Enrolls	# of Enrolls	% of Enrolls	# of Enrolls	% of Enrolls
Audited (No Credit Issued)	305	0%	16,759	3%	16,010	3%
Completed/Failed	57,767	18%	72,852	15%	69,609	14%
Completed/Passed	239,220	74%	358,141	72%	367,405	72%
Completed/Special Ed Only	0	0%	0	0%	226	0%
Incomplete	2,237	1%	5,031	1%	6,144	1%
Ongoing Enrolled/Special Ed	0	0%	0	0%	11	0%
Testing Out	85	0%	141	0%	415	0%
Withdrawn/Exited	15,610	5%	27,214	5%	32,104	6%
Withdrawn/Failing	4,336	1%	6,042	1%	5,714	1%
Withdrawn/Passing	5,842	2%	10,310	2%	12,133	2%
Total	**325,402**	**100%**	**496,490**	**100%**	**509,771**	**100%**

Upon closer inspection of the data, the difference in "Completed/Passed" percentages between how students perform in the non-virtual courses and how they perform in their virtual courses appears strongly tied to the virtual learning model itself. Figure 1 displays the completion status for the 2012-13 school year in which three different virtual learning models are compared against the non-virtual course completion status data. The *MVS* bars represent the performance of students whose enrollments (13,185) were attributed to the *Michigan Virtual School*. The Cyber School bars represent the performance of students whose enrollments (14,375) were attributed to cyber schools. The Other Virtual bars represent the performance of students whose virtual enrollments (157,493) did not occur with the *Michigan Virtual School* or a cyber school. The providers for the virtual enrollments in this category range from district-created solutions to non-*MVS* third party offerings. Finally, for comparison purposes, the Non-Virtual bars represent the non-virtual enrollments (509,771) for 2012-13 from the same students who are represented by the *MVS*, Cyber School, and Other Virtual bars in the chart.

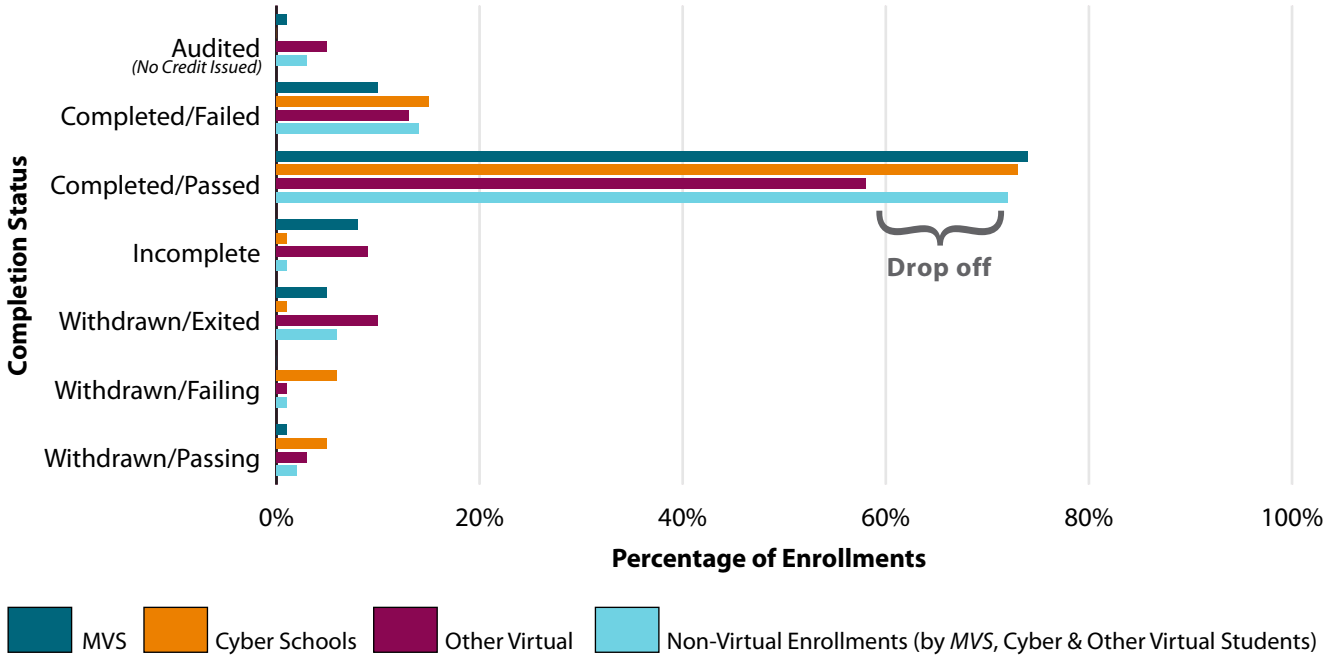

Figure 1. Completion Status Comparison between Virtual and Non-Virtual Enrollments Taken by the Same Students in 2012-13

Note: Figure 1 does not display "Completed/Special Ed," "Ongoing Enrolled/Special Ed," and "Testing Out" as each of them rounded to 0% of the enrollments per virtual model.

Completion Rates

At face value, Figure 1 appears to indicate that the 12% drop in the percentage of enrollments with a completion status of "Completion/Passed" during the 2012-13 school year between the non-virtual courses taken by students and the virtual courses taken by those same students is the result of poor peformance in the Other Virtual model. According to the chart, the Non-Virtual enrollments yielded a "Completion/Passed" rate of 72% whereas the Other Virtual enrollments yielded a 58% rate. Given that 87% of the enrollments in the data set are accounted for in those two percentages, poor performance in the Other Virtual model overwhelmingly explains the 12% difference observed.

However, what is not readily visible through the above chart is the fact that the "Completed/Passed" percentage for *MVS* virtual courses, which exceeds the Non-Virtual percentage (74% versus 72%), actually displays the same drop-off effect when restricting the *MVS* comparison group to only those non-virtual courses taken by students who took one or more *MVS* virtual courses. In Figure 2, this drop-off becomes visible.

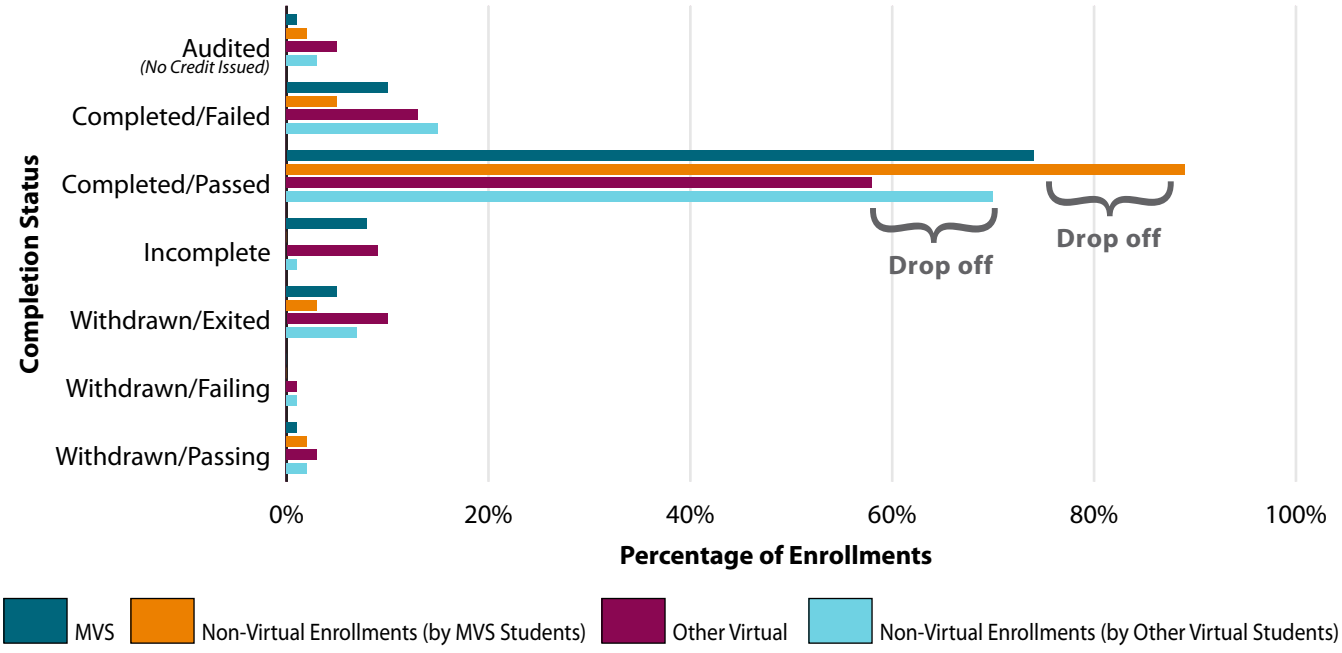

Figure 2. Completion Status Comparison between Virtual and Non-Virtual Enrollments Taken by the Same Students in 2012-13

Note: Figure 2 does not display "Completed/Special Ed," "Ongoing Enrolled/Special Ed," and "Testing Out" as each of them rounded to 0% of the enrollments per virtual model.

So even though the *MVS* virtual enrollments actually raise the overall virtual "Completed/Passed" percentage, this appears to be due to the fact that the students who are presently taking virtual courses with *MVS* are higher performing students than the average virtual learner in Michigan.

While the above explanation seems to make sense and account for the 12% drop, consider a different explanation. Though it is true that Tables 8 and 9 show a 12% drop in the percentage of enrollments ending with a "Completed/Passed" status, what is also curiously true is that the "failure" rates of the two populations is the same. Of the various completion statuses, only two of the statuses indicate failure – "Completed/Failed" and "Withdrawn/Failing." In the 2012-13 data for virtual students, 13% of the enrollments ended with a "Completed/Failed" status and an additional 2% with a status of "Withdrawn/Failing." Thus, 15% of the virtual enrollments in 2012-13 were classified as failing. Interestingly enough, this matches the failure rate for the non-virtual courses. In their case, 14% of the enrollments ended in "Completed/Failed" with another 1% being classified as "Withdrawn/Failing." This 12% drop, then, can also be accounted for by differences in the percentage of enrollments in the "Audited (No Credit Issued)," "Incomplete," "Withdrawn/Exited," and "Withdrawn/Passing" statuses.

Completion Rates

Now that the complex nature of interpreting the completion status data is better understood, Table 10 provides subject area "Completed/Passed" rates of virtual enrollments for each of the last three years.

Table 10. Percentage of "Completed/Passed" Michigan K-12 Virtual Course Enrollments by Subject Area and School Year

Subject Area	School Year		
	2010-11	2011-12	2012-13
Agriculture, Food and Natural Resources	97%	88%	69%
Architecture and Construction	33%	47%	50%
Business and Marketing	79%	77%	74%
Communication and Audio/Visual Technology	82%	73%	63%
Computer and Information Sciences	73%	68%	62%
Engineering and Technology	81%	79%	68%
*English Language and Literature	64%	59%	58%
Fine and Performing Arts	72%	68%	64%
Foreign Language and Literature	78%	79%	73%
Health Care Sciences	69%	50%	51%
Hospitality and Tourism	33%	49%	56%
Human Services	82%	77%	83%
*Life and Physical Sciences	64%	61%	60%
Manufacturing	33%	100%	86%
*Mathematics	63%	56%	56%
Military Science	100%	100%	-
*Miscellaneous	71%	61%	57%
Nonsubject Specific	80%	90%	86%
Physical, Health and Safety Education	72%	70%	65%
Public, Protective, and Government Service	84%	57%	65%
Religious Education and Theology	33%	100%	67%
*Social Sciences and History	65%	61%	63%
State Approved CTE Course	59%	77%	74%
Transportation, Distribution and Logistics	75%	45%	46%
Total	**66%**	**62%**	**60%**

The five subject areas marked with an asterisk in Table 10 reflect those subject areas that were identified in Table 3 on page 4 as accounting for 10% or more of the virtual enrollments for that year. For the 2012-13 school year, it appears as though virtual students in the core subjects of English Language and Literature and Mathematics tended to have lower "Completed/Passed" rates than students in Science and Social Sciences and History subject areas.

The research team cautions, however, against concluding that English or Math are more difficult subjects to learn virtually. One critical piece of data that the team did not have is why students were taking virtual courses. Think about the fact that face-to-face coursework is the default educational condition. Something unusual – scheduling conflict, course not available locally, the student failed the course face-to-face – typically happens in order to bring about the change to virtual. Additionally, for the academic periods reviewed in this report, the ability provided by the Michigan Legislature in 2013 for parents/students to choose up to two online courses per academic period was not yet in place. Rather, schools determined the rules for who could take a virtual course, or under what conditions virtual courses can be taken. In short, students' assignment to virtual courses did not occur at random.

Table 11 on page 12 looks at how the completion rates change by locale. In the past two years, the highest percentage of "Completed/Passed" statuses were from students in rural schools. In line with the argument above, the conclusion that rural students are better suited for virtual learning is questionable. Other factors, such as the reason for taking the virtual course, the kinds of students permitted to take a virtual course, or the supports these schools tend to provide are more likely key factors in their increased performance.

Completion Rates

Table 11. Percentage of "Completed/Passed" Michigan K-12 Virtual Course Enrollments by Locale and School Year

Locale	School Year		
	2010-11	2011-12	2012-13
Rural	69%	71%	72%
Town	68%	65%	58%
Suburb	71%	58%	61%
City	61%	59%	59%
MISSING	40%	52%	53%
Total	**66%**	**62%**	**60%**

These factors mentioned above likely play a role in explaining the variation in pass rates observed for entities. As Tables 12 and 13 display, some schools are very good at implementing quality virtual learning models. For instance, in 2012-13 about one third of schools (271) had "Completed/Passed" rates of 90% or better for their virtual enrollments. Unfortunately, some schools appear to struggle with implementing virtual learning.

Table 12. Count and Percentages of Entities by School "Completed/Passed" Rate Categories and School Year

School "Completed/ Passed" Rate	School Year					
	2010-11		2011-12		2012-13	
	# of Entities	% of Entities	# of Entities	% of Entities	# of Entities	% of Entities
0% to <10%	44	7%	71	8%	86	9%
10% to <20%	19	3%	26	3%	35	4%
20% to <30%	23	4%	36	4%	34	4%
30% to <40%	32	5%	38	4%	54	6%
40% to <50%	27	4%	57	7%	51	6%
50% to <60%	51	8%	83	10%	90	10%
60% to <70%	62	9%	103	12%	94	10%
70% to <80%	73	11%	80	9%	78	9%
80% to <90%	81	12%	101	12%	113	12%
90% to 100%	242	37%	255	30%	271	30%
Total	**654**	**100%**	**850**	**100%**	**906**	**100%**

Table 13. Percentages of Schools by School "Completed/Passed" Rate Categories, School Year, and Locale

School "Completed/ Passed" Rate	School Year											
	2010-11				2011-12				2012-13			
	Rural	Town	Sub	City	Rural	Town	Sub	City	Rural	Town	Sub	City
0% to <20%	9%	7%	7%	17%	8%	12%	12%	11%	11%	12%	12%	10%
20% to <40%	5%	5%	7%	11%	7%	9%	11%	6%	9%	10%	10%	10%
40% to <60%	9%	13%	13%	17%	13%	20%	16%	23%	13%	19%	17%	17%
60% to <80%	19%	26%	22%	21%	23%	20%	17%	25%	20%	19%	18%	24%
80% to 100%	58%	49%	51%	33%	48%	40%	44%	35%	47%	39%	43%	39%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Completion Rates

One of the areas where schools appear to struggle is supporting students who take a large percentage of virtual courses. Table 14 shows how the average number of virtual enrollments per student taking at least one virtual course for a school is related to schools' "Completed/Passed" rates. About 38% of the low ratio schools (schools with an average of less than two virtual courses per student taking at least one virtual course) for the 2012-13 school year had a "Completed/Passed" rate of 90% to 100%. Twenty-two percent of schools with medium ratios achieved the 90% to 100% rate and only 18% of high ratio schools.

Table 14. Percentage of Schools by School "Completed/Passed" Rates, School Year, and Virtual Usage

School "Completed/ Passed" Rate	School Year								
	2010-11			2011-12			2012-13		
	Low	Med	High	Low	Med	High	Low	Med	High
0% to <10%	6%	8%	9%	10%	5%	9%	11%	7%	8%
10% to <20%	2%	4%	6%	1%	6%	5%	2%	4%	9%
20% to <30%	3%	4%	9%	3%	5%	7%	2%	7%	4%
30% to <40%	3%	7%	10%	2%	7%	11%	3%	8%	10%
40% to <50%	3%	3%	11%	5%	9%	10%	2%	9%	12%
50% to <60%	6%	12%	9%	8%	13%	10%	8%	14%	10%
60% to <70%	8%	13%	12%	12%	15%	10%	10%	11%	11%
70% to <80%	12%	11%	5%	9%	9%	13%	10%	7%	5%
80% to <90%	13%	12%	10%	14%	10%	7%	14%	10%	10%
90% to 100%	43%	27%	20%	37%	22%	18%	38%	22%	18%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Note: Schools with a virtual course-to-virtual student ratio of two or less were classified as "Low." Schools with a ratio greater than two but less than or equal to four were classified as "Medium," and schools with ratios greater than four were classified as "High."

Student factors were also examined. As would seemingly follow from Table 14 above, students who took virtual courses as supplements to their non-virtual curriculum (all virtual enrollments except for cyber students) tended to do worse the more virtual courses they took in a year. On average, students had the highest "Completed/Passed" rates in their virtual courses when they took one to two virtual courses in a year (categorized as "Low" use). Students who took five or more virtual courses in a year (categorized as "High" use) tended to have lower "Completed/Passed" rates (see Table 15).

Table 15. Percentage of "Completed/Passed" Rates for Supplemental Virtual Learning by School Year and Virtual Usage

Student Level of Virtual Usage	School Year					
	2010-11		2011-12		2012-13	
	# of Enrolls	% Comp/Passed	# of Enrolls	% Comp/Passed	# of Enrolls	% Comp/Passed
Low	33,568	70%	45,673	67%	44,634	68%
Medium	17,098	62%	26,390	58%	31,182	59%
High	37,340	64%	70,335	58%	94,862	55%
Total	**88,006**	**66%**	**142,398**	**61%**	**170,678**	**59%**

Note: "Low" usage was classified as students taking two or fewer virtual courses in a school year. "Medium" usage was classified as students taking three to four virtual courses in a school year. "High" usage was classified as students taking more than five virtual courses in a school year.

The percentage of "Completed/Passed" also varied based on student grade level. For instance, in 2012-13, students in grades K-5 had "Completed/Passed" rates in the upper 80s to low 90s. Students in grades 9-10, on the other hand, showed a decline in this rate compared to the virtual students in other grade levels (see Table 16 on page 14).

Completion Rates

Table 16. Count and Percentage of "Completed/Passed" Michigan K-12 Virtual Course Enrollments by Grade Level and School Year

	School Year					
	2010-11		2011-12		2012-13	
Grade Level	# of Enrolls	% of Enrolls	# of Enrolls	% Comp/Pass	# of Enrolls	% Comp/Pass
K	150	95%	550	81%	541	91%
1	224	90%	825	91%	682	87%
2	154	77%	807	87%	1,037	94%
3	238	94%	788	87%	1,193	90%
4	352	66%	785	86%	1,176	92%
5	275	69%	909	82%	1,511	92%
6	1,084	83%	1,689	80%	3,170	77%
7	1,492	84%	2,980	78%	4,868	70%
8	2,453	82%	4,697	71%	7,267	72%
9	10,734	53%	17,654	48%	23,262	47%
10	19,589	60%	34,016	54%	40,604	52%
11	20,830	66%	33,194	60%	38,111	60%
12	32,346	72%	54,689	67%	61,631	65%
Total	**89,921**	**66%**	**153,583**	**62%**	**185,053**	**60%**

When it comes to completion status and gender, females seemed to fare a little better than males in virtual courses – though no statistical confirmation was run given the data reporting concerns. Other factors, such as specific titles taken, poverty levels, or the data reporting concerns could account for the discrepancies. It will be important to look at how this issue trends over time.

Table 17. Count and Percentage of Michigan K-12 Virtual Course Enrollments by Completion Status, School Year, and Gender

	School Year											
	2010-11				2011-12				2012-13			
Completion Status	#M	#F	%M	%F	#M	#F	%M	%F	#M	#F	%M	%F
Audited (No Credit Issued)	198	165	0%	0%	2,830	2,028	3%	3%	4,685	4,071	5%	5%
Completed/Failed	9,945	7,617	21%	18%	14,774	11,385	18%	16%	13,196	10,448	14%	12%
Completed/Passed	31,074	28,580	65%	68%	49,134	45,520	60%	63%	57,333	54,478	60%	61%
Incomplete	1,815	1,773	4%	4%	4,612	3,912	6%	5%	7,718	7,753	8%	9%
Testing Out	10	12	0%	0%	60	66	0%	0%	46	47	0%	0%
Withdrawn/Exited	2,898	2,607	6%	6%	5,858	5,172	7%	7%	8,419	7,656	9%	9%
Withdrawn/Failing	932	755	2%	2%	2,385	2,027	3%	3%	1,682	1,365	2%	2%
Withdrawn/Passing	782	758	2%	2%	2,014	1,806	2%	3%	3,158	2,998	3%	3%
Total	**47,654**	**42,267**	**100%**	**100%**	**81,667**	**71,916**	**100%**	**100%**	**96,237**	**88,816**	**100%**	**100%**

While the gender of the student may or may not be associated with completion status, the data clearly indicate that students who were identified as living in poverty did not perform as well as their non-poverty peers. In the 2012-13 data, 66% of the virtual enrollments from students not flagged as living in poverty achieved the completion status of "Completed/Passed" whereas only 52% of the virtual enrollments from students flagged as living in poverty achieved the same completion status (see Table 18 on page 15).

Completion Rates

Table 18. Percentage of Michigan K-12 Virtual Course Enrollments by Completion Status, School Year, and Poverty Indicator

	School Year					
	2010-11		2011-12		2012-13	
Completion Status	%Yes	%No	%Yes	%No	%Yes	%No
Audited (No Credit Issued)	0%	1%	3%	3%	5%	4%
Completed/Failed	23%	17%	20%	15%	15%	11%
Completed/Passed	60%	71%	55%	67%	52%	66%
Incomplete	5%	3%	6%	5%	10%	7%
Testing Out	0%	0%	0%	0%	0%	0%
Withdrawn/Exited	8%	5%	9%	6%	11%	7%
Withdrawn/Failing	2%	2%	4%	2%	2%	1%
Withdrawn/Passing	2%	2%	3%	2%	4%	3%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Note: The "%Yes" column presents data on enrollments from students living in poverty. The "%No" column presents data on enrollments from students who were not living in poverty.

The peformance decline observed for virtual students based on poverty level is also mirrored in the non-virtual enrollments in the data. As seen in Table 19, the "Completed/Passed" rate for the non-virtual enrollments taken by students who took at least one virtual course shows a 15% drop for students living in poverty.

Table 19. Percentage of Michigan K-12 Non-Virtual Course Enrollments for Students Enrolled in at Least One Virtual Course by Completion Status, School Year, and Poverty Indicator

	School Year					
	2010-11		2011-12		2012-13	
Completion Status	%Yes	%No	%Yes	%No	%Yes	%No
Audited (No Credit Issued)	0%	0%	3%	4%	3%	3%
Completed/Failed	24%	15%	21%	12%	20%	11%
Completed/Passed	65%	78%	62%	77%	62%	77%
Completed/Special Ed Only	0%	0%	0%	0%	0%	0%
Incomplete	1%	1%	1%	1%	2%	1%
Ongoing Enrolled/Special Ed	0%	0%	0%	0%	0%	0%
Testing Out	0%	0%	0%	0%	0%	0%
Withdrawn/Exited	6%	4%	8%	4%	10%	5%
Withdrawn/Failing	2%	1%	2%	1%	2%	1%
Withdrawn/Passing	2%	2%	2%	2%	3%	2%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Note: The "%Yes" column presents data on enrollments from students living in poverty. The "%No" column presents data on enrollments from students who were not living in poverty.

Like poverty level, students identified as seat time waiver students – which lifts the requirement for them to be physically in attendance at the school facility and lifts the cap on the number of online courses a student can take – experienced lower levels of success as measured by the "Completed/Passed" rate. Less than half of the virtual enrollments from seat time waiver students in the 2012-13 school year yielded a completion status of "Completed/Passed" compared with 65% from non-seat time waiver students (see Table 20 on page 16).

Completion Rates

Table 20. Percentage of Michigan K-12 Virtual Course Enrollments by Completion Status, School Year, and Seat Time Waiver Status

Completion Status	School Year					
	2010-11*		2011-12**		2012-13	
	%Yes	%No	%Yes	%No	%Yes	%No
Audited (No Credit Issued)	0%	0%	2%	3%	4%	5%
Completed/Failed	16%	20%	16%	17%	12%	13%
Completed/Passed	61%	68%	55%	64%	48%	65%
Incomplete	12%	3%	10%	5%	18%	5%
Testing Out	0%	0%	0%	0%	0%	0%
Withdrawn/Exited	9%	5%	16%	5%	15%	6%
Withdrawn/Failing	1%	2%	1%	3%	1%	2%
Withdrawn/Passing	1%	2%	1%	3%	2%	4%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

** 5,691 enrollments were excluded due to missing seat time waiver data.*
*** 2,894 enrollments were excluded due to missing seat time waiver data.*

We speculated that because virtual enrollments are not random occurrences, the students who take them may be different than the K-12 student population at large. Figure 3 presents important insight into the veracity of such speculation. The green bars in Figure 3 represent the percentage of Michigan students in 2012-13 who met the ACT benchmarks in English, Math, and Science. These data come from publicly available data (retrieved from http://www.michigan.gov/mde/0,4615,7-140-22709_35150_47474-306702--,00.html#print) and represent the population of all Michigan students who took the ACT in 2012-13 (regardless of whether or not they took virtual courses). In contrast, the light blue bars represent the performance of virtual students in the data set who did not take virtual courses in that subject area in 2011-12 or 2012-13. The differences between these two bars – 6.6% less in English from virtual students who didn't take English virtually, 5.3% less for Math from virtual students who didn't take Math virtually, 1.1% more for Science from virtual students who didn't take Science virtually – provide evidence that indeed, on average, students who are taking virtual courses in Michigan at present tend to reveal below average academic performance.

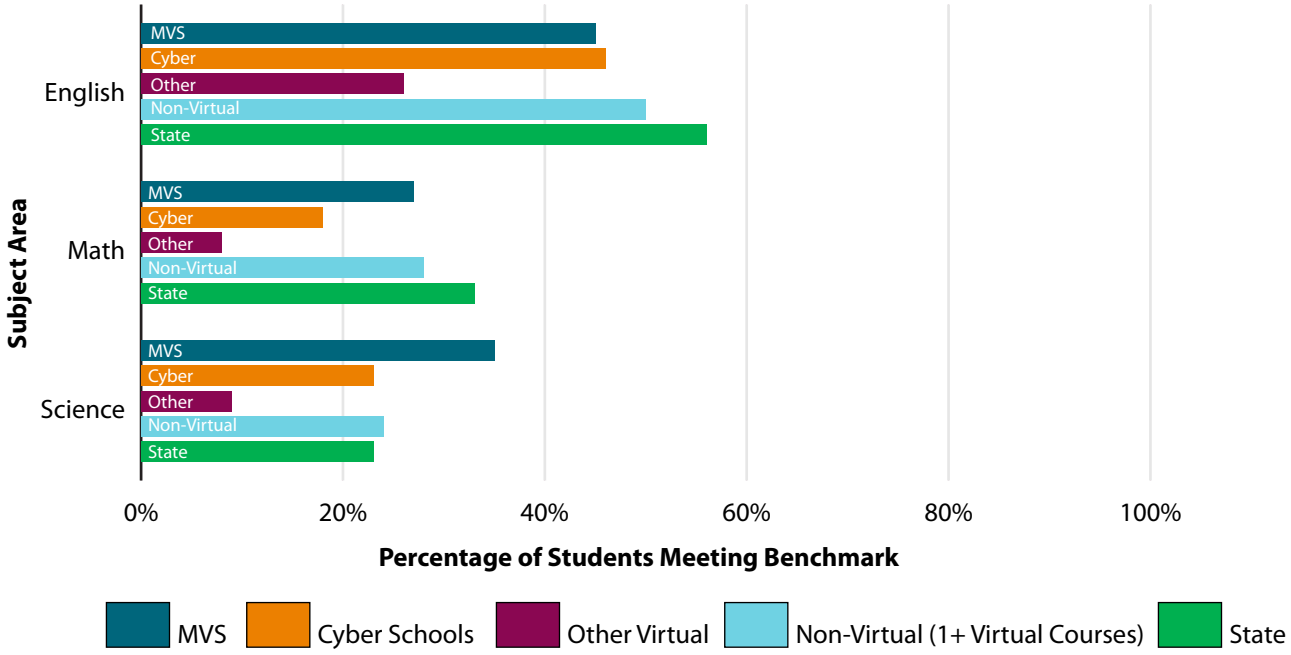

Figure 3. 2012-13 ACT College Readiness Benchmark Distributions

These findings ought not to be much of a surprise. Most anecdotal data indicate that schools emphasize virtual learning for credit recovery purposes. Unfortunately, Figure 3 seems to indicate that while those recovery efforts may be fruitful in helping students earn credit, the content in these courses is likely not being recovered or retained adequately to demonstrate it on the ACT exam.

Overall Impact

OVERALL IMPACT

There are multiple ways of measuring overall impact. One way to measure is to look at the percentage of Michigan students per grade level that took at least one virtual course per school year (see Table 21).

Table 21. Percentage of Michigan K-12 Students Taking a Virtual Course by Grade Level and School Year

Grade Level	School Year								
	2010-11			2011-12			2012-13 **		
	Virtual	All*	%	Virtual	All*	%	Virtual	All*	%
K	78	121,112	**0.06%**	171	122,558	**0.14%**	175	122,496	**0.14%**
1	76	116,105	**0.07%**	206	112,458	**0.18%**	199	113,047	**0.18%**
2	88	112,746	**0.08%**	196	113,885	**0.17%**	273	110,939	**0.25%**
3	92	113,022	**0.08%**	212	111,985	**0.19%**	206	113,332	**0.18%**
4	140	115,831	**0.12%**	173	112,465	**0.15%**	213	112,068	**0.19%**
5	145	117,168	**0.12%**	180	115,682	**0.16%**	291	112,720	**0.26%**
6	356	117,235	**0.30%**	609	117,692	**0.52%**	744	116,465	**0.64%**
7	616	119,068	**0.52%**	857	117,802	**0.73%**	1,155	118,538	**0.97%**
8	1,384	118,940	**1.16%**	1,760	118,628	**1.48%**	2,259	117,640	**1.92%**
9	4,359	132,231	**3.30%**	6,749	129,664	**5.20%**	7,661	128,118	**5.98%**
10	7,848	133,455	**5.88%**	11,369	130,291	**8.73%**	12,101	128,153	**9.44%**
11	8,595	121,569	**7.07%**	11,885	119,616	**9.94%**	12,061	117,464	**10.27%**
12	12,706	123,190	**10.31%**	18,173	120,862	**15.04%**	18,286	118,907	**15.38%**

** Total headcount data was obtained from the MISchoolData website (https://www.mischooldata.org/).*

*** Does not include all enrollment information for courses taken over the summer.*

The percentage of pupils in each of grades K-7 that are reported to have taken a virtual course remained below 1% for each of the last three years. High school students have considerably higher percentages of students taking virtual courses with about 15% of seniors in each of the past two years taking a virtual course.

Another way to measure overall impact is the percentage of overall enrollments that were delivered virtually. As evidenced by Table 22, the overall percentage of virtual courses is about 1% or less for each of the past three years, though this may be increasing. Although *MVU* did not obtain overall grade-level enrollment data to differentiate the percentage by grade-level, based on other findings, it seems safe to conclude that the percentage likely fluctuates considerably by grade-level with high school grades more likely to see larger percentages of virtual enrollments.

Table 22. Percentage of Michigan K-12 Virtual Enrollments by School Year

School Year	Virtual Enrollments	All Enrollments	% Virtual
2010-11	89,921	14,439,944	0.62%
2011-12	153,583	16,371,977	0.94%
2012-13	185,053	16,780,152	1.10%

Overall impact can also be measured by looking at subgroups such as gender, poverty, and seat time waiver. Considering gender first, in each of the past three school years, males accounted for a greater percentage of the virtual courses (see Table 23 on page 18).

Overall Impact

Table 23. Count and Percentage of Michigan K-12 Virtual Enrollments by Grade Level, School Year, and Gender

Grade Level	School Year														
	2010-11					2011-12					2012-13 *				
	#M	#F	Total	%M	%F	#M	#F	Total	%M	%F	#M	#F	Total	%M	%F
K	81	69	150	54%	46%	303	247	550	55%	45%	287	254	541	53%	47%
1	108	116	224	48%	52%	420	405	825	51%	49%	351	331	682	51%	49%
2	60	94	154	39%	61%	459	348	807	57%	43%	588	449	1,037	57%	43%
3	123	115	238	52%	48%	385	403	788	49%	51%	662	531	1,193	55%	45%
4	225	127	352	64%	36%	408	377	785	52%	48%	585	591	1,176	50%	50%
5	162	113	275	59%	41%	436	473	909	48%	52%	787	724	1,511	52%	48%
6	573	511	1,084	53%	47%	895	794	1,689	53%	47%	1,639	1,531	3,170	52%	48%
7	841	651	1,492	56%	44%	1,776	1,204	2,980	60%	40%	2,594	2,274	4,868	53%	47%
8	1,346	1,107	2,453	55%	45%	2,422	2,275	4,697	52%	48%	3,985	3,282	7,267	55%	45%
9	6,058	4,676	10,734	56%	44%	9,673	7,981	17,654	55%	45%	12,674	10,588	23,262	54%	46%
10	10,655	8,934	19,589	54%	46%	18,738	15,278	34,016	55%	45%	20,773	19,831	40,604	51%	49%
11	10,832	9,998	20,830	52%	48%	17,490	15,704	33,194	53%	47%	19,212	18,899	38,111	50%	50%
12	16,590	15,756	32,346	51%	49%	28,262	26,427	54,689	52%	48%	32,100	29,531	61,631	52%	48%
Total	**47,654**	**42,267**	**89,921**	**53%**	**47%**	**81,667**	**71,916**	**153,583**	**53%**	**47%**	**96,237**	**88,816**	**185,053**	**52%**	**48%**

** Reminder that 2012-13 school year does not include final enrollment information for courses taken over the summer.*

The data also show the percentage of students in poverty who took virtual courses was lower than the statewide average. For example, in the 2012-13 school year, roughly 50% of all Michigan K-5th grade pupils qualified for free or reduced lunch, but only about 30% of 3rd- and 4th-graders who took virtual courses were labeled as living in poverty. Caution should be exercised, however, since the low number of K-5th grade virtual students makes their estimates less stable. The high school percentages are more stable and still suggest grade level gaps of 6% to 7%.

Table 24. Michigan K-12 Virtual Enrollments by Grade Level, School Year, and Poverty Percentage

Grade Level	School Year					
	2010-11		2011-12		2012-13*	
	Virtual Pupils	MI Pupils	Virtual Pupils	MI Pupils	Virtual Pupils	MI Pupils
K	53%	47%	52%	51%	42%	52%
1	47%	52%	48%	54%	36%	54%
2	42%	52%	44%	53%	41%	53%
3	40%	51%	48%	52%	35%	52%
4	43%	51%	45%	51%	29%	51%
5	42%	49%	47%	50%	31%	50%
6	35%	49%	38%	50%	40%	50%
7	41%	47%	44%	49%	39%	48%
8	26%	46%	35%	47%	31%	47%
9	46%	45%	45%	47%	44%	47%
10	41%	42%	43%	44%	44%	44%
11	35%	38%	35%	40%	33%	40%
12	32%	35%	31%	38%	32%	38%
Total	**36%**	**46%**	**37%**	**48%**	**37%**	**48%**

Note: The percentage of total MI pupils in poverty per grade level were calculated from Fall free and reduced lunch count data available publicly from http://www.michigan.gov/cepi/0,4546,7-113-21423_30451_36965---,00.html

** May not include all final enrollment information for courses taken over the summer.*

Overall Impact

About 40% of the virtual course enrollments during each of the past three years were taken by students living in poverty (see Table 25).

Table 25. Count and Percentage of Michigan K-12 Virtual Enrollments by Poverty Level and School Year

Poverty Level	2010-11		2011-12		2012-13	
	# of Enrolls	% of Enrolls	# of Enrolls	% of Enrolls	# of Enrolls	% of Enrolls
In Poverty	36,909	41%	64,420	42%	76,223	41%
Not In Poverty	53,012	59%	89,163	58%	108,830	59%
Total	**89,921**	**100%**	**153,583**	**100%**	**185,053**	**100%**

For the 2012-13 school year, approximately 27% of the virtual courses were taken by seat time waiver students (see Table 26).

Table 26. Count and Percentage of Michigan K-12 Virtual Enrollments by Seat Time Waiver Status and School Year

Seat Time Waiver Status	2010-11		2011-12		2012-13	
	# of Enrolls	% of Enrolls	# of Enrolls	% of Enrolls	# of Enrolls	% of Enrolls
Yes	9,320	10%	28,567	19%	49,440	27%
No	74,910	83%	122,122	80%	135,613	73%
MISSING	5,691	6%	2,894	2%	-	-
Total	**89,921**	**100%**	**153,583**	**100%**	**185,053**	**100%**

Finally, the number of educational entities that have students who took a virtually delivered course is another measure of overall impact. Table 27 below shows the number of entities growing by about 39% from 2010-11 to 2012-13. While the percentage of Michigan K-12 entities that reported students taking virtual courses is in the low 20% range, this percentage masks variation by school level. Based on the data presented in Table 21 on page 17, the percentage of high school entities would likely be higher than this figure, whereas the percentage for elementary entities would likely be lower.

Table 27. Count of Michigan K-12 Educational Entities with Virtual Coursework

School Year	# of Entities	# of MI Entities*	% of Entities
2010-11	654	3,656	18%
2011-12	850	3,625	23%
2012-13	906	3,748	24%

Note: Some enrollments from 2011-12 and 2012-13 school years did not have district codes or building codes. Therefore, the number of entities for these years are under-reported.

** The percentage of all MI entities reported come from the Fall building-level pupil headcount data for each year that is available publicly from http://www.michigan.gov/cepi/0,4546,7-113-21423_30451_30460---,00.html*

Conclusion

CONCLUSION

This report provides findings on the pupil and enrollment totals, completion status, and overall impact of students taking virtual courses. In doing so, it provides a never possible before glimpse into K-12 virtual learning in Michigan. While this report represents a significant step forward in better understanding the impact of K-12 virtual learning in the state, there are many more steps that need to be taken to realize the potential of this educational delivery model.

First, while the report is based on a robust data set, the research team has been reticent to interpret the data due to concerns about the accuracy of the data presently being reported to the state for virtual enrollments. While the current state reporting requirements make it possible for schools to mark an enrollment as being delivered virtually, examination of the local course titles makes it clear that thousands of enrollments are likely not reporting proper data for this variable. Focusing awareness and training toward the proper reporting procedures could go a long way toward helping to improve data quality.

Second, even if the accuracy of the data shared with the state about virtual enrollments improves, the current data collection process does not allow for differentiation on other important variables. For instance, the current data collection process contains data on what school students were attending when they took the virtual course, but does not contain information on what school or third-party provided the content for the virtual course (or the instructor for the virtual course). The research team also does not have data on why the student chose to take the virtual course in the first place (was it for credit recovery, the course wasn't available locally, scheduling conflict, etc.). Such limitations are a recognized constraint when dealing with data reported to the state. Without such data, however, critical information for better understanding the successes and failures of virtual models is missing.

Third, the data that the research team does have represents a mixture of outcomes. On the one hand, there is evidence within this report that may lead some to claim that K-12 virtual learning simply is not working in Michigan. Detractors could cite lower completion rates for virtual enrollments, or they could focus on the finding that the results for students in poverty are not on par with students who are not. On the other hand, there is evidence that virtual learning is clearly working. Proponents could cite that about 40% of Michigan schools had an 80% or higher completion rate for their virtual enrollments. Or that students who take one or two virtual courses a year have a completion rate of almost 70%. Both statistics seem like even more significant accomplishments given that the data indicate schools tend to limit virtual learning options for students, seeing it more as a credit recovery option than as an initial credit solution.

Regardless, the findings presented here are not intended to further polarize along the lines of virtual learning either working or not working, but rather to aid in understanding under what conditions virtual learning can work and in doing so, with an understanding of the current educational climate and educational demands of the 21st century, change the collective mindset from "if" to "how." Existing research indicates, and the research team knows from experience, that virtual learning is far more likely to yield the desired results when the course content is high-quality, the virtual instructor is skilled at teaching online, and the student has wrap-around support including active local mentors and parents.

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