



Cornell University
ILR School

Cornell University ILR School
DigitalCommons@ILR

CAHRS Working Paper Series

Center for Advanced Human Resource Studies
(CAHRS)

June 2001

Strengthening Incentives for Student Effort and Learning: Michigan's Merit Award Program?

John H. Bishop

Cornell University, jhb5@cornell.edu

Follow this and additional works at: <http://digitalcommons.ilr.cornell.edu/cahrswp>

Thank you for downloading an article from DigitalCommons@ILR.

Support this valuable resource today!

This Article is brought to you for free and open access by the Center for Advanced Human Resource Studies (CAHRS) at DigitalCommons@ILR. It has been accepted for inclusion in CAHRS Working Paper Series by an authorized administrator of DigitalCommons@ILR. For more information, please contact hlmdigital@cornell.edu.

Strengthening Incentives for Student Effort and Learning: Michigan's Merit Award Program?

Abstract

[Excerpt] One of the primary reasons American students learn a good deal less during secondary school than students in other industrialized nations is that they devote less time and intellectual energy to the task.¹ Accountability systems designed to get teachers to try harder and set higher standards will not produce more student learning if [as one high school teacher put it] “students are sitting back in their desks, arms crossed, waiting for their teachers to make them smart (Zoch, 1998, p. 70).”

Learning is not a passive act; it requires the time and active involvement of the learner. In a classroom with 1 teacher and 25 students, there are 25 learning hours spent for every hour of teaching time. Learning takes work and that work is generally not going to be as much fun as hanging out with friends or watching TV. If students cannot be motivated to give up some time socializing or watching TV so that they can learn difficult material and develop high level skills, the time and talents of teachers will be wasted.

Keywords

American, student, learn, secondary school, school, teacher, program, state

Comments

Suggested Citation

Bishop, J. H. (2001). *Strengthening incentives for student effort and learning: Michigan's merit award program?* (CAHRS Working Paper #01-10). Ithaca, NY: Cornell University, School of Industrial and Labor Relations, Center for Advanced Human Resource Studies.
<http://digitalcommons.ilr.cornell.edu/cahrswp/73>

WORKING PAPER SERIES

Strengthening Incentives for Student Effort and Learning: Michigan's Merit Award Program?

John H. Bishop

Working Paper 01 – 10



Strengthening Incentives for Student Effort and Learning: Michigan's Merit Award Program?

John H. Bishop

Industrial and Labor Relations School

Cornell University

Ithaca, NY 14853-3901

Phone: (607) 255-2742

Fax: (607) 255-1836

Jhb5@cornell.edu

<http://www.ilr.cornell.edu/cahrs>

This paper has not undergone formal review or approval of the faculty of the ILR School. It is intended to make results of Center research available to others interested in preliminary form to encourage discussion and suggestions.

Strengthening Incentives for Student Effort and Learning: Michigan's Merit Award Program?

One of the primary reasons American students learn a good deal less during secondary school than students in other industrialized nations is that they devote less time and intellectual energy to the task.¹ Accountability systems designed to get teachers to try harder and set higher standards will not produce more student learning if [as one high school teacher put it] "students are sitting back in their desks, arms crossed, waiting for their teachers to make them smart (Zoch, 1998, p. 70)."

Learning is not a passive act; it requires the time and active involvement of the learner. In a classroom with 1 teacher and 25 students, there are 25 learning hours spent for every hour of teaching time. Learning takes work and that work is generally not going to be as much fun as hanging out with friends or watching TV. If students cannot be motivated to give up some time socializing or watching TV so that they can learn difficult material and develop high level skills, the time and talents of teachers will be wasted.

An important reason for establishing the Michigan Merit Award program is to motivate secondary school students to take their studies more seriously. Other states have chosen to tackle the student motivation problem by requiring students to pass a battery of minimum competency examinations (MCES) before they get a high school diploma. This approach was challenged in *Debra P. vs. Turlington*, 644F.2d 397 (5th Circuit 1981) and in *GI Forum et. al. vs. Texas Education Agency*. The implementation of Florida's graduation requirement was delayed, but was eventually allowed. The Texas case was decided in the state's favor on January 7, 2000.

Michigan chose not to go down this path largely because it wanted the MEAP HST to reflect more challenging learning goals than would be possible if the MEAP exams were being used to set minimum standards for high school graduation.² It also probably did not want to take the risk that an MCE would lower high school graduation rates and college attendance rates. Instead it took the modest step of putting MEAP HST scores on high school transcripts,

something, for example, that Connecticut does with its CAPT, Ohio does with its 12th grade Tests and New York and North Carolina do with their end-of-course exams.

In 1999 Michigan took the further step of offering a one year \$2500 scholarship to students who meet or exceed “Michigan standards” on four MEAP HST tests: Reading, Mathematics, Science and Writing. The Merit Award is intended:

First...to recognize and reward Michigan students who play by the rules, study hard, achieve on their tests and meet high standards. Second, by making postsecondary education more affordable, it encourages students to stay in school and pursue additional education and training after high school. Third, as the “Michigan Merit Award becomes a “household name” in Michigan, even more students will be inspired to raise their performance because they will know the scholarship is available to anyone who is willing to study hard and achieve. Finally, by creating a meaningful incentive for schools to excel and by motivating parents to demand a high quality education for their children, the scholarship program will promote improved school performance in the state.³

This is an ambitious set of objectives for a program whose annual budget is considerably less than 1 percent of total spending on K-12 education in the state of Michigan.⁴ Nevertheless, it is well designed for simultaneously achieving all four of these objectives. It has every chance of significantly raising student effort levels, increasing high school completion and college attendance rates, improving the educational climate in most schools and strengthening the resolve of parents and teachers to improve school performance. The key design decision that allows the program to simultaneously serve all four objectives is the decision to base awards on MEAP achievement examinations that reflect the state’s recommended curriculum and are graded by the state’s teachers. If the awards had been based on a predictive aptitude test like the ACT that is poorly aligned with the state’s curriculum, the demand for Kaplan ACT prep courses would

have risen but parental pressure for educational excellence would not have been stimulated and school climate would not improve. If awards had been based on high school GPA, objectives 1 and 2 might have been served to some degree, but many students would have responded by choosing unchallenging courses where A's are easy to get. Most importantly, there would be no incentive for schools to become better and for teachers to set higher standards. To the contrary, pressure on teachers to inflate grades would have intensified.

The paper is organized in four sections. In the first section I document the lack of engagement of American secondary school students and compare the time they devote to schoolwork to the time their overseas counterparts spend on schoolwork. Section 2 assesses the social costs of student disengagement and lack of effort. Students who blow off high school pay a very high price; a much larger price than they imagine when they are in school. They imagine they will be able to go to college regardless of low grades, regardless of low achievement. But, in fact, their chances of completing a degree program are almost zero. They are also unaware that applying themselves in high school helps them get jobs that offer training and promotion opportunities and eventually higher wage rates. Section 3 analyzes the structure of the Merit Award program and shows how it attacks the problem of motivating students to become more engaged in their studies. Section 4 provides evidence on the likely effects of the program by reviewing studies of other moderate stakes external examination systems in other states and in a number of Canadian provinces.

I. The Student Motivation Problem

No matter how you look at it, American secondary schools have a serious student motivation problem. At the completion of his study of American high schools, TheodoreSizer (1984) characterized students as, "*All too often docile, compliant, and without initiative* (p. 54)." John Goodlad (1983) described: "*...a general picture of considerable passivity among*

students...(p. 113)." The high school teachers surveyed by Goodlad ranked "lack of student interest" as the most important problem in education.

Time on Task: The low effort levels of American students also evidence themselves in studies of time on task. Classroom observation studies have found that students actively engage in a learning activity for only about half the time they are scheduled to be in school. A study of schools in Chicago found that public schools with high-achieving students averaged about 75 percent of class time for actual instruction; for schools with low achieving students, the average was 51 percent of class time (Frederick, 1977). Overall, Frederick, Walberg and Rasher (1979) estimated 46.5 percent of the potential learning time is lost due to absence, lateness, and inattention.

Studies of time allocation using the reliable time diary method have found that the average number of hours per week in school is 25.2 hours for primary school pupils, 28.7 hours for junior high students and 26.2 hours for senior high students. The comparable numbers for Japan are 38.2 hours for primary school, 46.6 hours for junior high school and 41.5 hours for senior high school (Juster and Stafford 1990). Since studies have found learning to be strongly related to time on task (Wiley 1986; Walberg 1992), these large differentials in time committed to learning are an important reason for the lag of American students behind Japanese students in math and science.

Homework: Harris Cooper's (1989) meta-analysis of randomized experimental studies found that students assigned homework scored about one-half a standard deviation higher on post tests than students not receiving homework assignments. The impact of homework on the rate at which middle school students learn was also significant, though somewhat smaller. There was no evidence of diminishing returns as the amount of homework assigned increased.

Nonexperimental studies indicate that the relationship between homework and learning is linear.

Nevertheless, homework is not even assigned in some classes. Arthur Powell describes one school he visited:

Students were given class time to read The Scarlet Letter, The Red Badge of Courage, Huckleberry Finn, and The Great Gatsby because many would not read the books if they were assigned as homework. Parents had complained that such homework was excessive. Pressure from them might even bring the teaching of the books to a halt...[As one teacher put it] "If you can't get them to read at home, you do the next best thing. It has to be done....I'm trying to be optimistic and say we're building up their expectations in school."(Powell, Farrar and Cohen 1985, p.81)

In the High School and Beyond Survey, students reported spending an average of only 3.5 hours per week on homework (National Opinion Research Corporation 1982). Time diaries yielded similar estimates for the early 1980s: 3.2 hours for junior high school and 3.8 hours for senior high school. Time diaries for Japanese students reveal that they spent 16.2 hours per week studying outside of school in junior high school and 19 hours a week studying in senior high school (Juster and Stafford 1992).

Homework assignments have increased since the early 1980s but hours spent doing homework remain low. In a 1991 survey, 29 percent of American 13 year olds said they were doing two or more hours of homework daily. The proportion doing more than two hours of homework was equally low in Canada and Portugal and even lower in Scotland and Switzerland. In most countries the proportion was higher: 79 percent in Northern Italy, 63-64 percent in Ireland and Spain, 50-58 percent in Israel, Hungary, France, Jordan and the former Soviet Union and 41-44 percent in Brazil, Korea, Taiwan and China (NCES 1992b Table 387).

A remarkably large number of students do not do the homework they are assigned. In the Educational Excellence Alliance's (EEA) survey of 21,535 students in Connecticut, Massachusetts, New Jersey and Pennsylvania, only 55 percent said they did all their homework, 29 percent said they did most of their homework and 16 percent said they did none or only some

of their homework. When we analyzed who has a high GPA, the single best predictor was the share of homework done, not race, parents education or self reported ability.

Other Uses of Time: When homework is added to engaged time at school, the total time devoted to study, instruction, and practice in the U.S. is only 18-22 hours per week – between 16 and 20 percent of the student's waking hours during the school year. By way of comparison, the typical high school senior spent nearly 10 hours per week in a part-time job (NORC 1982) and 19.6 hours per week watching television. Thus, TV occupies as much time as learning.

While some students are overscheduled and find it difficult to fit homework into their busy schedule, most have lots of free time. In the EEA survey 58 percent of students said they spend two or more hours per day watching TV. Fifty-two percent said they spend two or more hours a day talking with friends and hanging out.

Numerous studies conducted in a variety of countries have found that time spent watching TV is negatively correlated with student performance in school (IAEP 1992). In Table 1 we can see that secondary school students in other industrialized nations watch much less television: 55 percent less in Finland, 70 percent less in Norway and 44 percent less in Canada. Note that in

**Table 1—
Time Use By Students**

	<u>Hours Watching T.V per Week</u>		<u>Reading Time per Week</u>
	Students	Adults	Students
U.S.	19.6	15.9	1.4
Austria	6.3	10.6	4.9
Canada	10.9	13.3	1.5
Finland	9.0	9.0	6.0
Netherlands	10.6	13.4	4.3
Norway	5.9	7.2	4.3
Switzerland	7.7	9.0	4.8

Source: Hours spent per week on each activity derived from time diary studies. Organization of Economic Cooperation and Development, Living Conditions in OECD Countries, 1986, Tables 18.1 & 18.3.

other countries high school students watch less TV than adults; in the United States they watch more. Reading takes up 6 hours of a Finnish student's non-school time per week, 4.8 hours of Swiss and Austrian students time but only 1.4 hours of an American students time.

II. The Social Costs Of Student Disengagement And Lack Of Effort

Who suffers when students fail to devote sufficient time and effort to learning in high school? Not corporate America, they can respond to shortages of skilled workers by moving critical functions abroad and simplifying the jobs that stay in the U.S.. Profits need not decline. It is the students who lose. They lose in two ways.

First, their college aspirations end up not being fulfilled. Just about everybody wants to go to college—even those with poor grades and low test scores. Completing a college program, however, depends on the quality of the student's preparation in high school. For high school sophomores who tested in the top quartile in 1980, 62 percent actually got a bachelors degree in the next 12 years and another 7.2 percent got an associates degree. What about students in the bottom quartile of the test score distribution? Seventy five percent of them said, when they were high school sophomores, that they intended to go to college. But, twelve years later only 3.3 percent of them had actually obtained a bachelors degree and only 4.1 percent had gotten an Associates degree. Other student background characteristics—parent's education, race, socio-economic status also influence the probability of going to and completing college but none has as powerful an effect on actual outcomes.⁵ Many students appear to believe that they do not need to apply themselves in high school to achieve their goal of going to and completing college. They know that a local college will admit them even if they don't know how to spell or write a coherent paragraph. What they do not realize is that if they have not developed these and other basic skills in high school, actually completing a degree program is going to be extremely difficult.⁶

Low achievers will also pay a price by having to work in low wage jobs offering little job security and few chances for advancement. We seldom measure the actual literacy levels of adults but when we do we find that literacy has at least as big an effect on earnings and unemployment as years of schooling. Table 2 presents evidence for this assertion from the National Adult Literacy Survey. Adults in the bottom prose literacy group earn one-third as much as those in the top literacy group and were 6.5 times more likely to be unemployed. High school

dropouts, by contrast, earned 43 percent of what college graduates earn and were 2.6 times more likely to be unemployed.⁷

**Table 2—
Impact of Literacy and Schooling on the Earnings and Unemployment of Males**

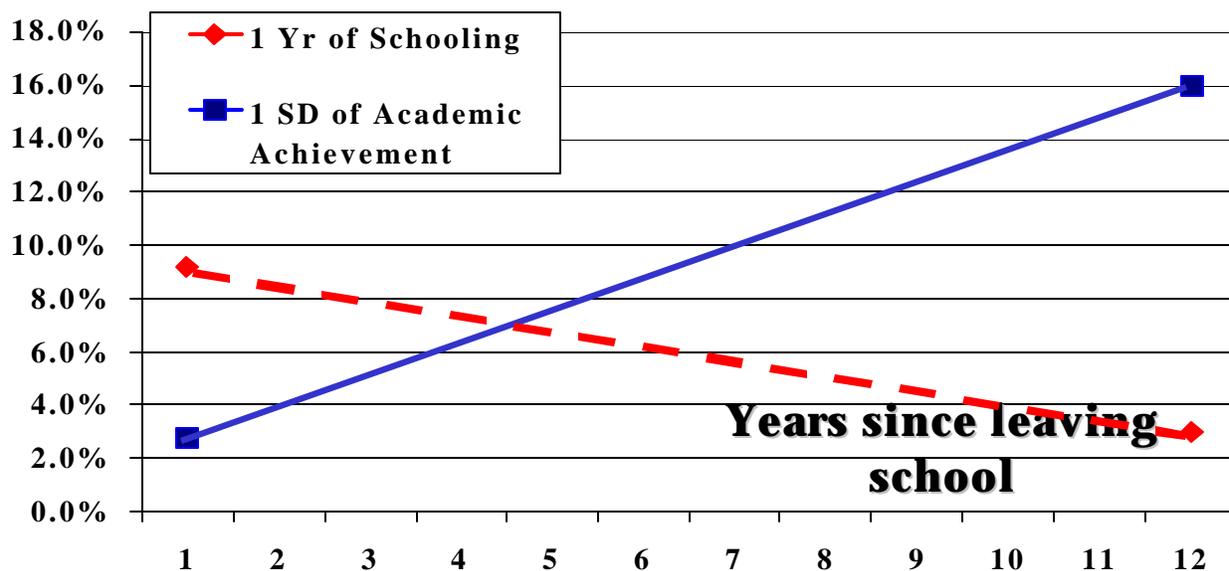
<u>Prose Literacy</u>	<u>Earnings</u>	<u>Unemployment Rate--1992</u>	<u>Schooling</u>	<u>Earnings</u>	<u>Unemployment Rate--1992</u>
Level 1	\$48,965	2.3 %	BA or more	\$38,115	4.8 %
Level 2	\$39,941	4.1 %	Assoc. Degree	\$31,855	5.5 %
Level 3	\$29,610	6.4 %	13-15 Yrs	\$27,279	7.4 %
Level 4	\$22,046	11.5 %	12 Yrs	\$22,494	8.2 %
Level 5	\$15,755	14.9 %	9-11 Yrs	\$16,194	12.4 %

Source: National Adult Literacy Survey of 1992, National Center for Education Statistics, Literacy in the Labor Force,

Altonji and Pierret's study of how scores on the Armed Forces Qualification Test (AFQT) taken while a teenager effect subsequent labor market success provides estimates of the magnitude of the effects of literacy and basic skills in the late 1980s and early 1990s. They are presented in Figure 1. Controlling for a contemporaneous measure of completed schooling, they found that a one standard deviation (4-5 grade level equivalent) higher AFQT score was associated with only a 2.8 percent increase in wage rates the first year out of school but a **16 percent** increase 11 years later.⁸ By contrast, the percentage impact of a year of schooling decreased with time out of school from 9.2 percent for those out just one year to 3 percent for those out for 12 years.

Literacy's effect on wages is initially small because employers seldom know which job applicants have the literacy skills they seek. Over time, however, employers learn which employees are the most competent by observing job performance. Those judged most competent are more likely to get further training, promotions and good recommendations when they move on. Poor performers are encouraged to leave. Since academic achievement in high school is correlated with job performance,⁹ the sorting process results in basic skills assessed during high school having a much larger effect on the labor market success of 30 year olds than of 19 year olds.¹⁰

Fig. 1--The Effect of Schooling and Academic Achievement on Wage Rates-- (Altonji & Pierret)



Source: Analysis of NLSY data by Altonji & Pierret 1997

The long delays before the benefits of academic achievement in high school start accruing send students the wrong signal. Teenagers know that college educated adults have good jobs and live in large attractive houses. That's why so many want to go to college. They do not know whether the successful adults they see in their community took rigorous courses and studied hard in high school. As we saw above they will observe almost no relationship between academic achievement of their older siblings/friends and the quality of their jobs. So it would be reasonable for youngsters to conclude that while credentials are rewarded by employers, learning is not. If that is the conclusion they draw, many will pursue a strategy of studying just hard enough to get the diploma and be admitted to college, but no harder.

III. Motivating Students To Pay Attention In Class And Study Harder ?

How can incentives for classroom engagement and hard study be increased? Lets begin by examining what student say motivates them to work hard in school. In 1998/99 the Educational Excellence Alliance (EEA) surveyed 35,000 students in 135 high schools in New York, New Jersey, Massachusetts, Connecticut and Pennsylvania. Students were asked **“When you work really hard in school, which of the following reasons are most important for you?”**

The most frequently cited reasons were extrinsic and future oriented.

- “I need the grades to get into college” 79 %
 - “Help me get a better job”..... 58 %
- Parents came in second:
- “To please or impress my parents”..... 55%
 - “My parents put pressure on me”..... 44%
- Intrinsic motivation placed third.
- “The subject is interesting” 42 %
- Teachers came in fourth:
- “My teachers encourage me to work hard”... 31 %
 - “The teacher demands it”..... 22 %
 - “To please or impress my teacher”..... 22 %

Multiple regression analysis of the EEA data confirmed the finding that prospects of going to college were the single most important reasons for working in high school. Holding other characteristics of the student body constant, schools with large numbers of students citing “need the grades to get into college” as their reason for working hard tended to have higher levels of classroom engagement and fewer students not doing their homework.

Some have proposed to strengthen incentives to study in high school by raising the minimum academic standard students must reach before they will be admitted to any post-secondary institution. This would be unwise for three reasons. Most people feel that society should offer everyone, no matter their age or how many mistakes they have made in the past, the opportunity to go back to school and try to make something better out of the rest of their life. The adolescent culture of high schools makes them alien territory for adults. Only colleges with open door admissions policies can serve this 2nd chance, 3rd chance function. Secondly, Michigan has

set a goal of expanding participation in post-secondary education. Ending open-door admissions policies might prevent that objective from being realized. Finally, denying admission to all colleges [not just one particular college] is clearly a high stakes decision. One would not want to base such an important decision solely on test scores from a single battery of tests.

Michigan has chosen a much wiser course. It's Merit Award program is well designed to simultaneously induce parents and teachers to set higher standards, induce students to study harder and increase college attendance rates. It has a number of positive features.

1. Conditioning awards on achievement makes absolutely transparent what students and parents must do to seize the opportunity. Students are being urged to study harder and to sign up for more demanding courses. The extra learning this produces benefits the student regardless of whether she ends up getting a merit award. By contrast, need-based financial aid programs often send no signal, a murky signal or the wrong signal and stimulate undesirable behavior. The rules for determining eligibility for need-based financial aid are highly complex and vary from institution to institution. Many low and moderate income parents are not aware that generous need-based financial aid will be forthcoming if their child is admitted to University of Michigan or Michigan State University, so they do not urge their children to set their sights high and to build the kind of academic record that would get them into the state's flagship institutions. At the other end of the spectrum are the growing number of savvy parents who arrange their finances to maximize their eligibility for financial aid. Here are some of the strategies recommended by the financial aid guide books:
 - < Do not create an education trust fund in your child's name. Financial aid formulas tax such assets at an extremely high rate.
 - < Put as many as possible of your own assets into 401k plans and IRAs. These are not counted as assets in financial aid formulas.
 - < In the year before your child enters college, Minimize your adjusted gross income on your federal tax return by having a Schedule C business with lots of deductible expenses.

2. Scholarship eligibility is open ended. The award goes to every student who meets or exceeds the absolute standard. Everyone in the school has the potential of getting the scholarship; not just the best student in French or Music or the students who rank in the top 10 percent of the graduating class. These other kinds of merit scholarships have the dysfunctional effect of pitting classmates against each other. Students who win these traditional merit scholarships are honored by their parents, but their classmates see them as nerds, suck ups or “Oreos.” That is why many schools stopped awarding these honors at compulsory daytime school assemblies. There were too many incidents of cat calls mixed with unenthusiastic applause. The Merit Award, by contrast, helps to reduce anti-nerd peer pressure. Students who joke around in class or try to get the teacher off track will no longer be honored and rewarded by peers because their disruptions make it harder for the rest of the class to get the \$2500 award.
3. Basing the Merit Award on an external assessment brings the educational goals of students, parents and teachers into alignment. Prior to the Merit Award program students and parents benefited little from administrative decisions opting for higher standards, more qualified teachers or a heavier student work load. The immediate consequences of such decisions -- higher taxes, more homework, having to repeat courses, lower GPA's, complaining parents, a greater risk of being denied a diploma--were negative. As a result, parents pressured teachers to be easy graders and were reluctant to vote higher tax levies so more highly qualified high school teachers could be recruited. The Merit award program will make parents stronger advocates of higher standards and better teaching.
4. The Merit Award standard was set at a level that is achievable by almost all students. The cut point is in the fat middle part of the distribution of student achievement, so incentive effects are maximized. Few will feel the HST tests are so difficult, they have no chance of being recognized for meeting Michigan standards.

5. The special long term financing of the program means that parents of 9 year olds can be confident it will be there for their child when she finishes high school. This maximizes incentive effects because confidence in the future availability of the Merit Award improves student attitudes and effort throughout their school career not just during the junior and senior year of high school. This is one of the reasons why “I Have a Dream” programs often have such salutary effects on student motivation and success.¹¹ Studies of the impacts of need-based financial aid have found strong effects on which college students attend, but they have not been able to establish that it has large effects on the overall college attendance rates. One reason for this second finding may be that key decisions are made in middle school about courses taken and how hard to try and middle school students from low income families are unaware that they will be eligible for generous financial aid if they build a solid academic record.
6. The centralized grading of the extended answer portions of MEAP exams by Michigan teachers is a very positive feature of the program. Having to agree on what constituted excellent, good, poor, and failing responses to essay questions or open-ended math problems results in a sharing of perspectives and teaching tips that the teachers find very helpful. In May 1996 I interviewed a number of teachers union activists about the examination system in the Canadian province of Alberta. They universally reported that serving on grading committees was “...a wonderful professional development activity (Bob, 1996).”
7. The scholarship is modest in size and lasts for only one year. Consequently the selection of scholarship winners is a low or moderate stakes decision not a high stakes decision.¹² Because the stakes are moderate not high, the APA’s recommendation that decisions be made on the basis of multiple indicators does not apply to the award of merit awards on the basis of MEAP test scores.¹³

8. No one is made worse off. In fact, those who do not meet Michigan standards and do not get a Merit award will find it easier to get conventional need-based aid. Michigan colleges will tend to be redirect their budgets for student assistance towards those not eligible for Merit awards.

9. The Merit Award Program is a small part of an integrated and balanced system of financing higher education and assisting students to attend college. Many of the other components of this funding system target their funds on disadvantaged and minority students. Families with incomes below \$100,000 are eligible for a federal tax credit of up to \$1500 for each student going to college. This probably yielded Michigan families about \$366,000,000 in tax credits last year.¹⁴ In addition to the tax credits, federal student aid programs provided Michigan undergraduates \$235,206,000 in need based grants and interest subsidies in fiscal 1997 (NCES, 1998, Table 365, p. 416). Institutions of higher education in Michigan awarded \$466,289,000 in scholarships and grants in fiscal 1996

Table 3

New York State Student Achievement compared to other States in the early 1990s

	NYS	Participation Rate	Parents Educ. Index	Prop. Black	Prop. Hispanic	Prop. Foreign Born	Prop. In Poverty	Prop. Private School	Prop. Large School	Prop. 3+ Math Courses	Prop. 3+ Eng. Courses	R Sq/ RMSE	Mean/ Std Dev
1992 NAEP Math 8 th Grade	9.6 (2.1)**		68** (2.7)	-32*** (6.1)	-1 (.1)	-66*** (3.2)	-.52** (2.5)					.831 4.23	
Total SAT	46** (2.7)	-.68** (2.6)	370*** (6.4)	-.135 (3.2)				60 (1.6)	-44* (1.8)	85 (1.3)	-36 (.3)	.926 14.8	925 55
SAT Independent Variables--Mean	.027	.414	.581	.078				.207	.120	.617	.797		
Std. Deviation	.164	.240	.097	.064				.082	.113	.067	.038		

Source: Analysis of 1991 state average scores on the NAEP mathematics assessment and the summed math and verbal SAT-I tests. The mean and standard deviation for the variables used in the SAT analysis are in rows 5 and 6 of the table. NAEP test results are reported on a scale where a grade level equivalent is about 10 points.

- *** p < .01 on a two tail test
- ** p < .05 on a two tail test
- * p < .10 on a two tail test

much of which was need-based and went to undergraduates. The Merit Award program adds about \$100,000,000 annually to the student aid pot, less than one-tenth of the total. In addition, state and local government appropriated \$1,927,812,000 to support higher education institutions in fiscal 1996.¹⁵ Almost all of these funds support the instructional function of these institutions and directly benefited students. The state funding was roughly \$4,727 per student. Without these state funds, tuition would have doubled or tripled, pricing many low and moderate income students out of college. College students also benefit from a host of other state and federal subsidies: the deductibility gifts to higher education and the tax exempt status of land and buildings and endowment income. Thus the Merit Award program is just a tiny piece--3.4 percent--of total public subsidies of higher education in the state of Michigan. It's the merit piece of an overall higher education funding plan that devotes more than six times as much money to need-based student financial aid.

The Merit Award program is well designed to achieve its objectives of stimulating greater student effort and raising academic standards. What do the experiences of other states and nearby Canadian provinces tell us about its likelihood of success. We turn now to a review of that evidence.

IV. The Effects of Moderate Stakes Curriculum-Based External Exit Exams on Student Achievement and High School Climate

How has the Merit Award program changed the incentives faced by Michigan students? Prior to the Merit Award program, the measures of student competence that were rewarded were ACT test scores and grade point averages. MEAP HSTs were no-stakes exams and many student were blowing them off. What has changed? First, the rewards for learning increased. Second, the Merit Awards changed how student achievement was defined and rewarded.. ACTs

scores and GPAs still matter but now state-developed curriculum -based external assessments of achievement matter as well. By this step Michigan created a low/moderate stakes curriculum -based external exit exam system. What's a curriculum -based external exit exam system (CBEEES)? It:

1. **Produces signals of student accomplishment that have real consequences for the student.**
2. **Defines achievement relative to an external standard, not relative to other students in the classroom or the school.** Fair comparisons of achievement across schools and across students at different schools are now possible. Costrell's (1994) analysis of the optimal setting of educational standards concluded that more centralized standard setting (state or national achievement exams) results in higher standards, higher achievement and higher social welfare than decentralized standard setting (i.e. teacher grading or schools graduation requirements).
3. **Is organized by discipline and keyed to the content of specific course sequences.**
This focuses responsibility for preparing the student for particular exams on one (or a small group of) teacher/s.
4. **Signals multiple levels of achievement in the subject.** If only a pass-fail signal is generated by an exam, the standard will have to be set low enough to allow almost everyone to pass and this will not stimulate the great bulk of students to greater effort (Kang 1985; Costrell 1994).
3. **Sponsored by and developed to the specifications of the department that funds and regulates elementary and secondary education in the state.** External exit exams must be aligned with the state's curriculum. State control facilitates curriculum reform because coordinated changes in instruction and in exams are feasible. The exams are more likely to be used for school accountability and this magnifies it's effects on school culture and student effort.. Tests established and mandated by other organizations serve the interests of other

masters. America's most influential high stakes exams--the SAT-I and the ACT—serve the needs of colleges to sort students by aptitude not the needs of high schools to reward students who have learned what the school is trying to teach. When state government has developed the exam, it is more likely to take responsibility for how much students learn and make the necessary changes in school funding, teacher licensing and professional development regulations.

5. **Covers all or almost all secondary school students.**
6. **Assess a major portion of what students studying a subject are expected to know or be able to do.** It is, however, not essential that the external exam assess every instructional objective. Teachers can be given responsibility for evaluating dimensions of performance that cannot be reliably assessed by external means.

High stakes curriculum based external exam systems are found throughout East Asia and in much of Europe—e.g. England, Scotland, Ireland, France, Italy, Denmark, Finland, Hungary, Poland, Russia, the Czech Republic and the Slovak Republic. Careful empirical analysis of data from the 40 nation Third International Mathematics and Science Study (TIMSS) has found that teaching is more rigorous and students learn more in nations with CBEEES.¹⁶ Analysis of data from TIMSS found that students from countries with CBEEE systems outperform students from other countries at a comparable level of economic development by **1.3** U.S. grade level equivalents in science and by **1.0** U.S. grade level equivalent in mathematics. A similar analysis of International Assessment of Educational Progress data on achievement in 1991 of 13 year olds in 15 nations found that students from countries with CBEEES outperformed their counterparts in countries without CBEEES by about 2 U.S. grade level equivalents in math and about two-thirds of a US grade level equivalent in science and geography. Analysis of data from the International Association for the Evaluation of Educational Achievement's study of reading literacy of 14 year olds in 24 countries found that students in countries with CBEEES were about **1.0** U.S. grade level

equivalent ahead of students in nations at comparable levels of development that lacked a CBEEES.¹⁷

In some of these nations the stakes attached to exam results are extremely high. It is quite legitimate to question how relevant these findings are for predicting the likely effects of low and moderate stakes CBEEES systems like the one in Michigan. While most nations with CBEEESs have gone the high stakes route, some have not—e.g. Canada and the Netherlands. We will look at Canada. In addition, two American states—New York and North Carolina—have had moderate stakes CBEEES for many years. CBEEES systems are being phased in elsewhere in the U.S. but none of these states had a system up and running in the late 1990s that combined scale with student consequences.

Evidence from Canada: In 1990-91 Alberta, British Columbia, Newfoundland, Quebec and Francophone New Brunswick had curriculum-based provincial examinations in Language Arts during junior year and second language, mathematics, biology, chemistry, and physics during the senior year of high school. The other provinces did not have curriculum-based provincial external exit examinations. The exams were developed by teachers selected by the Ministry of Education and graded by teachers in centralized locations. Exam scores accounted for 50 percent of that year's final grade in Alberta, Newfoundland and Quebec and 40 percent in British Columbia. While exam results appeared on transcripts, college admissions decisions were based almost entirely on high school grades and were generally made before the senior year exams were graded.

I assessed the effects of these diploma exam systems by analyzing 1991 International Assessment of Educational Progress data on mathematics and science achievement of 8th graders in 1362 Canadian schools. I found that controlling for the size and structure of the school and social background of its students, schools in provinces with CBEEES were a statistically significant one-half of a U.S. grade level equivalent ahead in math and science of comparable schools in provinces without CBEEES.¹⁸

The impacts of CBEEES on school policies and instructional practices were also studied. CBEEES were not associated with higher teacher-pupil ratios or greater spending on K-12 education. They were, however, associated with higher teacher salaries, a greater likelihood of having middle school teachers specialize in teaching one subject in middle school and a greater likelihood of hiring teachers who have majored in the subject they will teach. Schools in CBEEES provinces devoted more hours to math and science instruction and built and equipped better science labs. The number of computers and library books per student were unaffected by CBEEES.¹⁹

Fears that CBEEES would cause the quality of instruction to deteriorate appear to be unfounded. Students in CBEEES jurisdictions were less likely to say that memorization was the way to learn the subject and more likely to do experiments in science class. Apparently, teachers subject to the subtle pressure of an external exam four years in the future adopted strategies that are conventionally viewed as "best practice," not strategies designed to maximize scores on multiple choice tests. Quizzes and tests were more common, but in other respects a variety of indicators of pedagogy were no different in CBEEES jurisdictions. Students were not less likely to like the subject and they were more likely to agree with the statement that science is useful in every day life. Students also talked with their parents more about school work and reported their parents had more positive attitudes about the subject.

New York and North Carolina's Moderate Stakes CBEEES: Begun in the 1860s, New York State's curriculum-based Regents Examination System is the oldest American example of end-of-course examinations (EOCE). A college bound student taking a full schedule of Regents courses would typically take Regents exams in mathematics and earth science at the end of 9th grade; mathematics, biology and global studies exams at the end of 10th grade; mathematics, chemistry, American history, English and foreign language exams at the end of 11th grade and a physics exam at the end of 12th grade. For students the stakes attached to Regents exams were pretty modest. Each district decided whether Regents exam grades were to

be a part of the course grade and how much weight to assign to them. While almost all districts counted Regents exam results as a final exam grade, teachers or departments generally gave their own final as well so when grades on finals were averaged in with quarterly marking period grades, Regents exam scores seldom accounted for more than an eighth of the student's final grade in a course. Eligibility for a "Regents" as opposed to a local diploma depended on passing the Regents exams, but the benefits of getting a "Regents" diploma have declined and have been small for the last two decades. During the 1950s and 60s Regents exam scores were used to select winners of Regents scholarships. Regents exam grades also appeared on high school transcripts, but in recent years college admissions decisions depended primarily on grades and SAT scores, not Regents exam scores or Regents diplomas.²⁰

North Carolina introduced End-Of-Course (EOC) tests for Algebra 1 and 2, Geometry, Biology, Chemistry, Physics, Physical Science, U.S. History, Social Science and English 1 between 1988 and 1991. Except for a four year interlude in which some tests were made a local option, all students taking these courses were required to take the state tests. Easier versions of these courses not assessed by a state test do not exist, so virtually all North Carolina high school students take at least six of these exams. Test scores are reported separately on the student's transcript. Most teachers have been incorporating EOC exam scores into their course grades and a state law now mandates that, starting in the year 2000, the EOCE test scores must have at least a 25% weight in the final course grade.

How are North Carolina and New York doing? Did student test scores go up in North Carolina after they implemented their end-of course exams. Yes they did. In fact according to Grissmer, Flanagan, Kawata and Williamson (2000), 4th and 8th grade test scores rose more rapidly from 1990 to 1996 in North Carolina than in any other state.²¹ While suggestive, such a finding is not conclusive. North Carolina was introducing other accountability policies--rewards for school improvement and sanctions for poor performance--at the same time, so the increase in 8th grade test scores could be due to these efforts not the CBEEES.

New York has had the Regents exams for more than one hundred years, so there is no reason to expect particularly rapid test score gains. The effects of the Regents exam system can be studied by examining cross section data as was done in the international and Canadian studies described above.

New York's students are more disadvantaged, more heavily minority and more likely to be foreign born than students in most other states. Consequently, when one compares student achievement levels, family background must be taken into account. Considering the high incidence of at-risk children, New York students do remarkably well. Table 3 presents the results of a linear regressions predicting 1992 NAEP math scores and 1991 mean SAT-M + SAT-V test scores for all states for which data are available. With the exception of the dummy variable for New York State, all right hand side variables are proportions --generally the share of the test taking population with the characteristic described. In the analysis of 8th grade math scores the controls for student background were: the proportion of people under age 18 who live in poverty, a schooling index for the adult population, percent foreign born, percent public school students who are black and percent public school students who are Hispanic, parent's education, the poverty rate, percent black and percent foreign born all had significant effects on math achievement in the expected direction. New York State's mean NAEP math score was a statistically significant 9.6 points (or about one grade level equivalent) above the level predicted by the regression model.

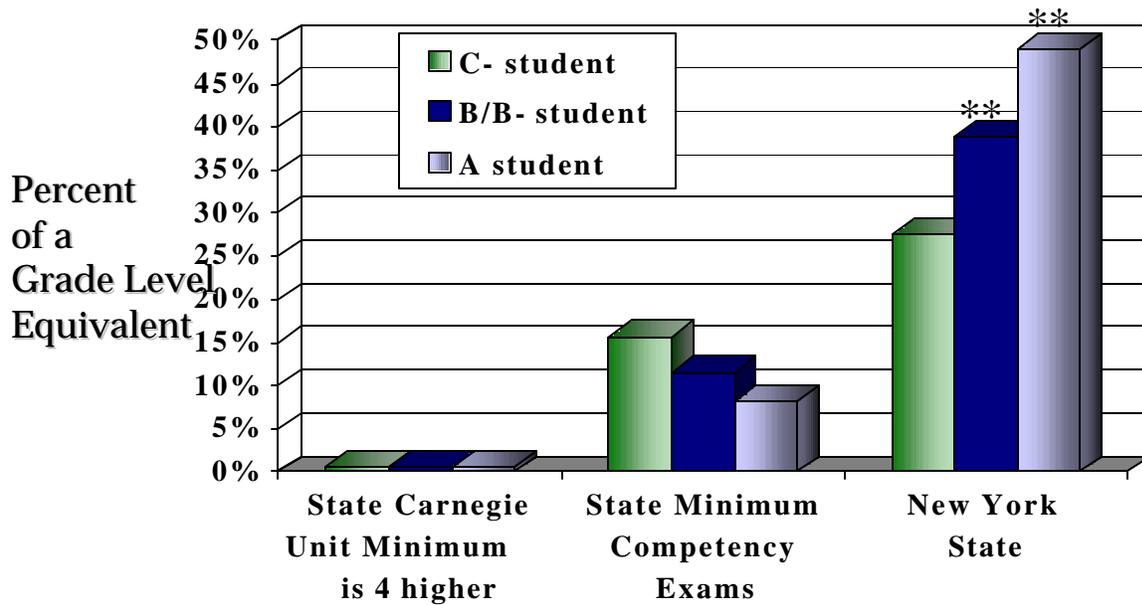
[Table 3 about here]

In the analysis of SAT test score means, the control variables were a parents' education index, percent black, percent in private schools, percent in large schools, percent who had taken 3 or more courses in math and English and the percent of high school graduates who take the SAT. New Yorkers did significantly better (46 points better) on the SAT than students of the same race and social background living in other states. For individuals the summed SAT-V + SAT-M has a standard deviation of approximately 200 points. Consequently, the differential between New York State's SAT mean and the prediction for New York based on outcomes in the other 36 states is

about 20 percent of a standard deviation or about three-quarters of a grade level equivalent (Bishop, Mane and Moriarty 2000).

Further evidence on the effect of New York’s CBEEES system comes from an analysis of test score gains between 8th and 12th grade that will appear shortly in the Brookings Papers on Education Policy. The results of our analysis of NELS:88 data are presented in Figure 2. We found significantly larger test score gains (about 40 % of a grade level equivalent) by students in New York (Bishop, Mane, Bishop and Moriarty 2001). Increases in the number of courses required to graduate and minimum competency exams did not have significant effects on test score gains.

Figure 2--Effects of Graduation Requirements on 8th to 12th Grade Test Score Gains by GPA in 8th Grade



Source: Analysis of NELS:88 data--controls for attitudes, socio-economic status, GPA in 8th grade, state & high school characteristics.

This paper also analyzed 1996 and 1998 state cross section data on 8th grade NAEP reading, mathematics and science test scores. Our models included controls for the following demographic characteristics of the students attending school in the state: the share of children living in poverty, parental education, the share of public school students who are African-

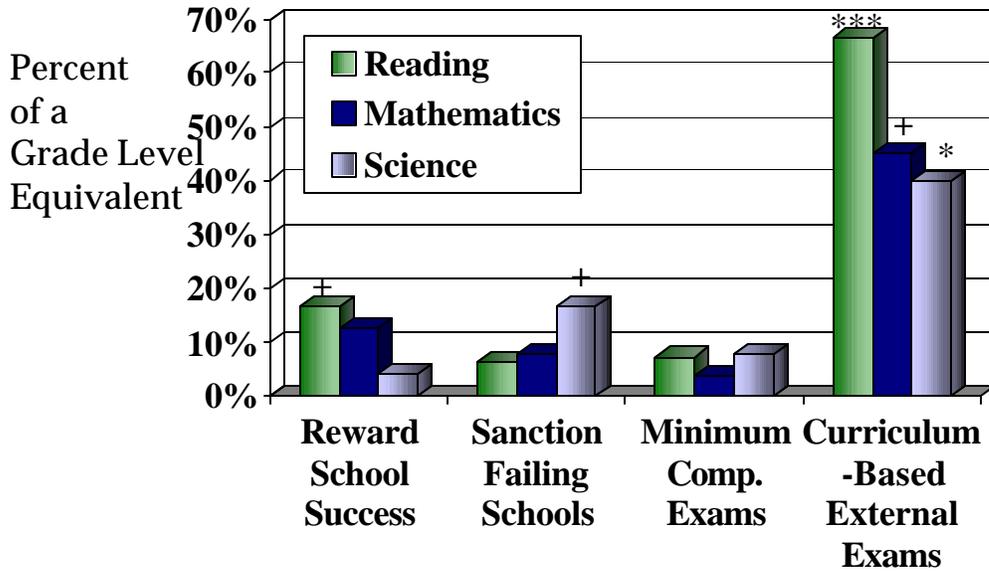
American, the share who are Hispanic and the share who are Asian-American. States that have moderate or high stakes tests for students tend to have also adopted school accountability systems that reward high achieving schools or sanction failing schools that do not improve during the early 1990s. This means that unbiased estimates of the effect of minimum competency exams and CBEEES are possible only when the presence or absence of other standards-based reform initiatives is taken into account. We, therefore, studied the impact of four different policies:

1. Rewards for schools that improve on statewide tests or exceed targets set for them
2. Sanctions for failing schools—closure, reconstitution, loss of accreditation etc.
3. Minimum competency exams
4. Moderate Stakes Curriculum-based External Exit Exam System—i.e. the New York/North Carolina stakes for students policy mix during the 1990s²²

Results of the analysis are presented in Figure 3. The policy that clearly had the biggest effects on test scores is the moderate-stakes curriculum-based external exit exam system. In science and mathematics 8th graders in New York and North Carolina were one-half of a grade level equivalent (GLE) ahead of comparable students in states without minimum competency exams or CBEEES. They were also a 63 percent of a GLE ahead in reading.

Stakes for teachers and schools also had significant effects on all three measures of 8th grade achievement. Students living in states that in 1996/7 were both rewarding successful schools and threatening to sanction failing schools were about 28 percent of a GLE ahead in all three subjects of students in states that did neither. Public reporting is necessary for the implementation of these other policies but on its own it had no discernable effect on student achievement. Point estimates for the impact of minimum competency exams were positive but small and only one of the three coefficients was significant at the 10 percent level on a one tail test.

Figure 3--Effects of Standards-Based Reform Initiatives on 1996-98 NAEP 8th Grade Test Scores



Michigan—first year effects of the Merit Award program: What does the behavior of the first cohort of students eligible for Michigan Merit Awards, the class of 2000, tell us about the effects of the program. Table 4 presents data collected from the Michigan Department of Education, the State Budget Office and the Merit Award program tracking the number of people taking and passing MEAP HST exams. The first two columns of the table report the number of students who took and passed the MEAP HST during the spring of 1998 and 1999. Governor Engler proposed the Merit Award program in January 1999, four months before the high school juniors were supposed to take the HST test in May. While the authorizing legislation didn't pass until a couple of months later, passage was expected throughout the spring and most students were aware that taking and passing all the HST tests would probably result in their getting a \$2500 scholarship. Consequently, the very large (11,316) increase between 1998 and 1999 in the numbers taking the reading HST was at least in part due to the announcement of the program.

The third column of the table gives counts for the graduating class of 2000. Most of these students first took the HST in spring 1999. The 10,473 increase in numbers taking the reading HST are students who took the HST in either fall 1999 or Spring 2000 after not taking the test in spring 1999. This number would almost certainly been a lot smaller in the absence of the Merit Award program.

Not only did the number of students taking the exam go up, the number of students demonstrating that they met or exceeded Michigan's education goals rose dramatically. In reading, for example, the number of students meeting standard increased by 13,733 between spring 1998 and spring 1999 and then by another 8032 by the time the class of 2000 had completed senior year. The proportion of test takers meeting the goals went up significantly.

Did college attendance go up? Data is not available on the college attendance rate of students in the Class of 2000. There is data, however, on trends in the number of students in each graduating class who took the ACT test and how they did on the test. Since the ACT test is the college admissions test used by almost all Michigan colleges and universities, the count of

Table 4: Michigan Public School Students Who Met or Exceeded State Standards on the MEAP High School Tests

		Spring 1998	Spring 1999	Class of 2000
Math	Endorsed (% of Tested)	60.5 %	63.6 %	64.8 %
	Number Endorsed	43,122	53,632	59,592
	Increase from Previous Year		10,510	5,960
Reading	Endorsed (% of Tested)	58.9 %	67.3 %	69.4 %
	Number Endorsed	42,216	55,949	63,981
	Increase from Previous Year		13,733	8,032
Science	Endorsed (% of Tested)	51.7 %	51.0 %	55.6 %
	Number Endorsed	36,559	41,911	50,723
	Increase from Previous Year		5,352	8,812
Writing	Endorsed (% of Tested)	56.6 %	52.5 %	58.4 %
	Number Endorsed	39,104	41,868	51,608
	Increase from Previous Year		2,764	9,740
# Public School Students who took the High School Test in Reading		70,401	81,717	92,190
Number of Students in graduating class Eligible for Merit Award				42,000

Data for 1998 and 1999 are for first-time test takers in the Spring administration of the MEAP HST. Source: It is from "MEAP Scores Reflect At Least 20,000 Students Eligible for Merit Scholarships" at www.meritaward.state.mi.us/whatsnew/newsrel/1999/092899_2.htm. The data for the Class of 2000 is for the graduating class of 2000 and represents the highest test score for students who had multiple opportunities to take the test before graduating in 2000. It is from www.meritaward.state.mi.us/merit/meap/results/data/2000summary.htm.

students taking this test is a good indicator of trends in the number of students expecting to go to college. These data are presented in Table 5. Classes graduating in 1999 and earlier years were not eligible for Merit Awards. ACT test taking rates were stable from 1997 to 1999. The Merit Award kicked in with the class of 2000 and remarkably the ACT test-taking rate increased by 2 percentage points for that class. Furthermore the share of ACT test takers from minority groups also rose in 2000. This suggests that the Merit Award may have stimulated a larger proportionate increase in college going among minority groups than among whites. Furthermore, ACT test scores were stable. This suggests that the increase in the proportion of seniors taking the ACT did not lower the average test scores of ACT test takers.

Table 5
Trends in ACT Test Taking and Scores for Michigan

	Graduating Class of:			
	1997	1998	1999	2000
Students taking the ACT	66,628	68,769	70,669	73,918
Mean ACT Score	21.3	21.3	21.3	21.3
High School seniors during the Previous Fall	95,151	99,628	100,384	102,282
Share of Seniors taking ACT Test	70.0	69.0 %	70.4 %	72.3 %
Share of test takers who were:				
African-American	9.02 %	9.72 %	9.87 %	9.97 %
Asian	2.14 %	2.22 %	2.35 %	2.50 %
Hispanic (Mexican, P.R, other)	2.02 %	1.91 %	1.86 %	1.89 %
Number of High School Graduates	87,457	92,732	95,500	

Source: "ACT High School Profile Report--H.S. Graduating Class 2000: Michigan." Data on the number of high school graduates is from various issues of the Digest of Education Statistics, Tables 99, 105. October 1 Fall headcounts were obtained from Paul Bielawski of the Michigan Dept. of Education.

Conclusion

I conclude that the case for the Michigan Merit Award program is very strong. Many, probably most, of the Michigan's secondary school students have not been devoting as much time and energy to learning as their parents and the public would like. Students who blow off high school pay a very high price; a much larger price than they imagine when they are in school. They imagine they will be able to go to college regardless of low grades, regardless of low achievement. But, in fact, their chances of completing a degree program are almost zero. They are also unaware that applying themselves in high school helps them get jobs that offer training and promotion opportunities and eventually higher wage rates. Consequently, it is sensible for state government to purposely try to strengthen incentives to study and to make them absolutely transparent to students and parents. That is exactly what the Merit Award program accomplishes.

The Merit Award's use of the MEAP HST as the primary method for selecting scholarship winners creates a moderate-stakes curriculum-based external exit exam system in state of Michigan. Experience with similar examination systems in Canada, New York and North Carolina is very positive. Michigan can reasonably anticipate that the Merit Award program will increase student effort and learning, make parents stronger advocates of higher standards, increase college attendance and reduce college drop out rates.

References

- Bishop, John H. , Joan Moriarty and Ferran Mane, "Diplomas for Learning: not Seat Time," *Economics of Education Review*. Vol. 19, No. 3, 2000.
- Bishop, John and Ferran Mane. (2001) "Incentive Effects of New York State's Reform Strategy" to appear in Parental Choice vs. Best Systems: What Improves Education eds. Margaret Wong and Herbert Walberg, Lawrence Earlbaum Associates, 1-35 .
- Bishop, John, Ferran Mane, Michael Bishop and Joan Moriarty. (2001) "The Role of End-of-Course Exams and Minimum Competency Exams in Standards-Based Reforms." forthcoming in Brookings Papers on Education Policy, edited by Diane Ravitch, (Washington, DC: The Brookings Institution),
- Bob, Interview conducted in Calgary Alberta in May 1996.
- Cooper, Harris M. Homework. White Plains, New York: Longman, 1989.
- Costrell, Robert. (1994a) "A Simple Model of Educational Standards." The American Economic Review. Vol. 84, # 4, Sept., 956-971.
- Frederick, W. C. "The Use of Classroom Time in High Schools Above or Below the Median Reading Score." Urban Education 11, no. 4 (January 1977): 459-464.
- Frederick, W.; Walberg, H.; and Rasher, S. "Time, Teacher Comments, and Achievement in Urban High Schools." Journal of Educational Research 73, no. 2 (November-December 1979): 63-65.
- Goodlad, J. A Place Called School. New York: McGraw-Hill, 1983.
- Grissmer, David and Ann Flanagan, Jennifer Kawata and Stephanie Williamson. Improving Student Achievement: What NAEP test scores tell us. Rand Corporation, 2000, 1-271.
- High School and Beyond. Data File Users Manual. National Opinion Research Corporation, Chicago, Illinois, 1982.
- Hollenbeck, K., and Smith B. The Influence of Applicants' Education and Skills on Employability Assessments by Employers. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1984.
- International Assessment of Educational Progress, Learning Science. Princeton, New Jersey: Educational Testing Service 1992a.
- International Assessment of Educational Progress, Learning Mathematics. Princeton, New Jersey: Educational Testing Service 1992b.
- Jencks, Christopher and Crouse, James. "Aptitude vs. Achievement: Should We Replace the SAT?" The Public Interest, 1982.

- Juster, Thomas and Stafford, Frank. "The Allocation of Time: Empirical Findings, Behavioral Models and Problems of Measurement." Ann Arbor, Mich.: Survey Research Center, Institute for Social Research,
- Longitudinal Survey of American Youth. "Data File User's Manual" Dekalb, Ill: Public Opinion Laboratory, 1988.
- National Center for Education Statistics. The Digest of Education Statistics. [various years] Wash. D.C.: US Department of Education..
- Organization of Economic Co-operation and Development. Living Conditions in OECD Countries: A Compendium of Social Indicators. Social Policy Studies No. 3. Paris, France: Organization for Economic Co-operation and Development, 1986.
- Organization of Economic Co-operation and Development. Education at a Glance. Paris, France: Organization for Economic Co-operation and Development, 1992.
- Powell, Arthur; Farrar, Eleanor and Cohen, David. The Shopping Mall High School. New York, New York: Houghton Mifflin, 1985.
- Rubenstein, Ross and Gary Henry, "Paying for Grades: Impact of Merit-Based Financial Aid on Educational Quality" Georgia State University, Oct. 2000, 1-30.
- Sizer, Theodore R. Horace's Compromise: The Dilemma of the American High School. Boston: Houghton Mifflin, 1984.
- U.S. General Accounting Office, Educational Testing: The Canadian Experience with Standards, Examinations and Assessments. (written by Kathleen D. White) GAO/PEMD-93-11, Washington, D.C., April 1993, 1-74.
- Wiley, David E. "Another Hour, Another Day: Quantity of Schooling, a Potent Path for Policy." In Schooling Achievement in American Society, edited by William H. Sewell, Robert M. Hauser, and David L. Featherman. New York: Academic Press, 1976.
- Zoch, Paul. "A Teacher's View of Accountability." Selected Readings on School Reform. Winter 1999, Vol. 3, No. 1, Washington, DC: Thomas B. Fordham Foundation. 70-71.

Endnotes

¹ For information on U.S. lags in student achievement see: Beaton, Albert et al. (1996) Mathematics Achievement in the Middle School Years: IEA's Third International Mathematics and Science Study. CSTEPP, Boston College., Boston MA., 1-186. or John Bishop, "Secondary Education in the United States: What can others learn from our mistakes?" (with Ferran Mane) presented at Challenges of Secondary Education in Latin America and the Caribbean, Inter-American Development Bank's Regional Policy Dialogue, Washington, DC, Dec. 5-6, 2000.

² MCEs typically set a low minimum standard. In 1996 only 4 of the 17 states with MCEs targeted their graduation exams at a 10th grade proficiency level or higher. Failure rates for students taking the test for the first time varied a great deal: from a high of 46% in Texas, 34 % in Virginia, 30% in Tennessee and 27% in New Jersey to a low of 7% for Mississippi. However, since students can take the tests multiple times, eventual pass rates for the Class of 1995 were much higher: 98% in Louisiana, Maryland, New York, North Carolina and Ohio; 96 % in Nevada and New Jersey, 91% in Texas and 83% in Georgia. [American Federation of Teachers, *Making Standards Matter:1996* (Washington, DC: American Federation of Teachers, 1996) p. 30.] Since the tests are designed to determine who falls below a pretty low standard, they typically do not assess material that college bound students study in 10th and 11th grade (e.g. Algebra II and geometry proofs). This may result in too much class time being devoted to practicing low level skills.

³ Testimony of Mark Murray, State Treasurer of Michigan, before the Subcommittee on Oversight and investigations, Committee on Education and Workforce, US House of Representatives, September 8, 1999. Available at www.meritaward.state.mi.us/merit/murray.htm.

⁴ Michigan spent \$12,698,697,000 on K-12 education in fiscal 1996. The \$100,000,000 annual cost of the Merit Award program is less than 0.8 percent of this figure.

⁵ National Center for Education Statistics, Digest of Education Statistics, 1993, p. 137 and 1998 p. 329.

⁶ James Rosenbaum, "College for all: Do Students understand what College demands?" Northwestern University, (1999), 1-36. and Clifford Adelman, "Answers in the Tool Box: Academic Intensity, Attendance Patterns and Bachelors Degree Attainment." Wash, DC: Office of Educational Research and Improvement, 1999, 1-87.

⁷ These tabulations do not measure the causal effects of either schooling or prose literacy. Causal effects will be smaller because early literacy levels influence completed schooling, because additional schooling raises literacy and because working in white collar and professional and managerial jobs raises literacy and increases the probability of returning to school for further education.

⁸ Large as it is, this 16 percent figure substantially understates the total effect of improved K-12 learning on earnings as an adult. First, test scores influence hours of work and the risk of unemployment, not just wage rates. Secondly, the AFQT is an incomplete measure of what students are learning in high school. If reliable measures of other skills learned in school (such as science, social studies, writing, technical and computer skills) were included in the model, the total effect of test scores would be larger. The third and most important source of bias comes from using a contemporaneous measure of schooling as a control. Much of the benefit of learning in the first 12 years of school comes from the assistance it provides in continuing schooling beyond high school. Yet, this benefit of learning in high school does not get picked up by the AFQT coefficient. It is captured, instead, by the coefficient on the contemporaneous measure of schooling. If a prospective measure of schooling (completed schooling at the time of the AFQT test) were substituted for the contemporaneous measure, the coefficient on the AFQT would have been much larger. Joseph Altonji and Charles Pierret, "Employer Learning and Statistical Discrimination." Forthcoming in Quarterly Journal of Economics.

⁹ M. H. Brenner. "The use of high school data to predict work performance," *The Journal of Applied Psychology* Vol. 52, # 1, (1968), pp. 29-30.; Department of Labor, *General Aptitude Test Battery Manual* (Superintendent of Documents, 1970).; John E. Hunter, James J. Crosson and David H. Friedman, "The Validity of the Armed Services Vocational Aptitude Battery (ASVAB) For Civilian and Military Job Performance" (Department of Defense, August 1985). John Hartigan and Alexandra Wigdor, eds. *Fairness in Employment Testing* (Washington, D.C.: National Academy Press, 1989). John H. Bishop, "Impact of Academic Competencies on Wages, Unemployment and Job Performance," *Carnegie-Rochester Conference Series on Public Policy*, Volume 37, (December 1992), pp. 127-194.

¹⁰ J. C. Hauser and Thomas M. Daymont, "Schooling, ability and earnings: Cross-sectional evidence 8-14 years after high school," *Sociology of Education*, Vol. 50 (July 1977), 182-206; Paul Taubman and Terence Wales, "Education as an investment and a screening device," *Education, Income and Human Behavior*, ed. F. T. Juster, (New York: McGraw Hill, 1975), pp. 95-122; and Henry Farber and Robert Gibbons, "Learning and Wage Dynamics," *Quarterly Journal of Economics* (1996), pp. 1007-47.

¹¹ "I Have a Dream" programs also have other important program elements not currently a part of the Merit Award program.. Mehan, H., Hubbard, L. and Villanueva, I. (1994) "Forming academic identities: Accommodation without assimilation among involuntary minorities." *Anthropology and Education Quarterly* , 25(2), 91-117. and Joseph Kahane and Kim Bailey, "The Role of Social Capital in Youth Development: The Case of 'I Have a Dream' Programs," *Educational Evaluation and Policy Analysis* , 21(3), Fall 1999, 321-343.

¹² In the educational context the phrase "high stakes" refers to decisions that have big effects on a person's life. Examples of such decisions are classification as needing special education, retention in grade, the award or denial of a high school diploma and admission to state colleges. One way to measure the stakes is to calculate impacts on lifetime earnings of completing extra years of schooling. The present discounted value of these earnings differentials is roughly \$200,000 for high school graduation and \$525,000 for college graduation. These are decisions that Michigan educational institutions base on multiple indicators of student achievement and aptitude of which high school grades are the most important..

¹³ The stakes attached to getting a merit award are smaller than those associated with getting a 4 or 5 on an Advanced Placement (AP) exam. Students who get a 4 or 5 on an AP exam are typically awarded 3 to 8 credits by the college they attend. Note that the grades awarded by teachers have no impact on whether one gets advanced placement credit from a postsecondary institution. Everything depends on how the student does on a single 3 hour exam. At Cornell University tuition is \$750 per credit, so students potentially save \$3000 when awarded 4 AP credits and \$6000 when awarded 8 AP credits. At low tuition public colleges the tuition savings are smaller, but the saving in time is just as important. If one gets 16 AP credits from one's college, one can graduate and enter the labor market as a college graduate one semester earlier. During that 5 month period one can earn \$10,000 to \$15,000. If the Michigan Merit Award Program is forced to use teacher grades as one of the criteria in its awards because the stakes are considered to be high can a challenge to public colleges awarding advanced placement credit based on AP exams be far behind?

¹⁴ Michigan had 546,000 students in colleges and universities in fall 1996. Assuming that two-thirds of these students claim an average credit of \$1000, I estimate that about \$366,000,000 in federal education tax credits were awarded to Michigan families in fiscal 2000.

¹⁵ Barbett , Samuel and Korb, Roslyn. *Current Fund Revenues and Expenditures of Degree Granting Institutions: Fiscal Year 1996* , Washington, DC: National Center for Education Statistics, NCES 1999-161, 1-40.

¹⁶ The models controlled for East Asian nation and for GDP per capita. John H. Bishop, (1996) "The Impact of Curriculum-Based External Examinations on School Priorities and Student Learning." *International Journal of Education Research*; John H. Bishop, "The Effect of National Standards and Curriculum-Based

External Exams on Student Achievement.” American Economic Review, May 1997, Similar results were obtained by Ludger Wößmann, “Schooling Resources, Educational Institutions, and Student Performance: The International Evidence,” Kiel Working Paper No. 983, (May 2000) Kiel Institute of World Economics, Germany, <<http://www.uni-kiel.de/ifw/pub/kap/2000/kap983.htm>> 1-88.

¹⁷ John H. Bishop, “Are National Exit Examinations Important For Educational Efficiency?” Swedish Economic Policy Review, Vol. 6, #2, Fall 1999, 349-401.

¹⁸ Bishop John. “Do Curriculum-Based External Exit Exam Systems Enhance Student Achievement?” University of Pennsylvania, Consortium for Policy research in Education, CPRE Research Report RR-40, 1998, 1-32. John H. Bishop, “Nerd Harrassment, Incentives, School Priorities and Learning,” *Earning and Learning*, ed. by Susan Mayer and Paul Peterson, (Washington, DC: Brookings Institution Press, 1999a). John H. Bishop, “Are National Exit Examinations Important For Educational Efficiency?” Swedish Economic Policy Review, Vol. 6, #2, Fall 1999, 349-401.

¹⁹ Ibid.

²⁰ John H. Bishop, “Nerd Harrassment and Grade Inflation: Are College Admissions Policies Partly Responsible?” Center for Advanced Human Resources Discussion Paper #99-14, (1999c).

²¹ Grissmer et al (2000) carefully adjusted state NAEP trend data for changes in the ethnic and socio-economic composition of the students taking NAEP assessments in the state and calculated corrected estimates of the annual rate of test score gains in the state. Exclusion of students from testing was also analyzed and adjusted for. States had to have participated in successive state NAEP assessments in the same subject area to be included in the analysis. There 36 states that met this criterion. Other states with particularly large test score gains were: Texas (# 2), Michigan (# 3), Indiana (# 4), Maryland (# 5) and West Virginia (# 6). Since there were no stakes for students in Michigan during this period, other factors such as the school accountability system or increased spending probably account for the success.

²² California is not counted as a CBEEES state because (a) the state did not have a MCE graduation requirement, (b) teachers could not use Golden State exam scores in their own grading, (c) other rewards for doing well on the exams were weak and (d) the program was being phased in slowly so by the middle of the 1990s most students were not participating and most participating teachers had not been teaching in the new environment long enough to change their expectations of what students were to achieve.