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ABSTRACT

Ohio career-technical education (CTE) occurs in joint vocational school districts (JVSDs), singles, and compacts; courses are grouped into three program areas: workforce development, work and family studies, and career-based intervention. The weighted funding approach and size of the current weights are the result of a 1997 analysis by the Ohio Department of Education (ODE), which contends CTE costs more to provide than regular education. In examining this analysis, the Legislative Office of Education Oversight (LOEO) has found numerous methodological errors and inconsistencies that call into question the validity of current weights. LOEO has analyzed CTE's cost through an inspection of teacher salaries and class size, multiple regression analysis, and comparison of funding practices in other states. CTE teacher salaries are not substantially higher and class sizes are smaller than those in regular education. Regression analysis indicates only a subset of "high-cost" CTE courses within workforce development causes districts to spend more; only 26 percent of full-time equivalent CTE students are enrolled in them; and districts belonging to JVSDs spend, on average, less per pupil than other districts. Among nine states that use weighted funding for CTE, Ohio has the largest weights and the second highest base cost amount. LOEO has found little evidence to support Ohio's current configuration of supplemental funding weights for CTE. (Appendixes include state agencies providing workforce development programs, a 34-item bibliography, a map of CTE planning districts, CTE courses, descriptions of the weighted funding formula, the regression analysis, state approaches to funding vocational education, and comments from committee members and the LOEO response. A summary is also provided.) (YLB)

Evaluation of Career-Technical Education Funding in Ohio

LEGISLATIVE OFFICE OF EDUCATION OVERSIGHT
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The Legislative Office of Education Oversight (LOEO) serves as staff to the Legislative Committee on Education Oversight. Created by the Ohio General Assembly in 1989, the Office evaluates education-related activities funded by the state of Ohio. This LOEO report evaluates Ohio's current system for funding career-technical education and offers recommendations. *Conclusions and recommendations in this report are those of the LOEO staff and do not necessarily reflect the views of the Committee or its members.*

This report is available at LOEO's web site: http://www.loeo.state.oh.us

Summary

Evaluation of Career-Technical Education Funding in Ohio

Background

Career-technical education, formerly known as vocational education, typically begins in middle school and continues through high school.

Career-technical education in Ohio typically begins in middle school and continues through high school, where most career-technical courses are taught. Ohio law requires that districts must provide career-technical education, which they may choose to do independently or in collaboration with other districts.

There are three primary settings in which career-technical education occurs in the state. In fiscal year 2002, these include:

- 49 joint vocational school districts (JVSDs);
- 28 singles; and
- 16 compacts, serving all 612 school districts.

Career-technical education courses are grouped into three categories: Workforce Development, Work & Family Studies, and Career-Based Intervention.

Career-technical education courses in Ohio are grouped into three program areas:

- Workforce Development;
- Work & Family Studies; and
- Career-Based Intervention.

Workforce Development courses are intended to lead to high-skill and high-wage jobs and include courses such as horticulture, marketing, dental assistance, and auto technology.

Work & Family Studies courses focus on such areas as family relations, nutrition and wellness, parenting and personal development.

Career-Based Intervention includes both academic and work-related courses. This program area targets at-risk students and replaces programs that were previously labeled as Occupational Work Adjustment (OWA) and Occupational Work Experience (OWE).

In FY 2000, there were approximately 76,000 full-time equivalent students in career-technical education.

In fiscal year 2000, there were approximately 76,000 full-time equivalent (FTE) students in career-technical education. In terms of **setting:**

- 56% of FTE students were in JVSDs;
- 18% in singles; and
- 26% in compacts.

In terms of **program area**:

- 56% of FTE students were in Workforce Development;
- 31% in Work & Family Studies; and
- 13% in Career-Based Intervention.

Career-Technical Education Funding

In FY 1999, "unit" funding was replaced by weighted-pupil funding for career-technical education.

Similar to regular education funding, the current method for funding career-technical education in Ohio is a state and local partnership. Career-technical education also receives a significant amount of federal funding. In fiscal year 2000, an estimated $700 million in state, local, and federal funding was provided for career-technical education.

In fiscal year 1999, the Ohio General Assembly adopted a weighted-pupil funding method for career-technical education to replace a "unit" system. Under the new method, school districts receive the base cost amount ($4,052 in fiscal year 2000) plus a weighted per pupil amount for each full-time equivalent student within the three program areas.

Career-technical education full-time equivalent students receive weights of either 30% or 60% more than the base cost amount.

For each full-time equivalent student in Workforce Development, districts receive state funding equal to 60% more than the base cost amount (weight of 0.60). For each student in Work & Family Studies or Career-Based Intervention, districts receive state funding equal to 30% more than the base cost amount (weight of 0.30).

The current weights are based on a 1997 cost analysis performed by the Ohio Department of Education (ODE).

In addition to the weighted-pupil funding, the state also supports career-technical programming at the secondary level with several provisions in the base cost line item and the vocational education enhancements line item in the biennial operating budget.

LOEO's Analysis of Career-Technical Education Costs

The weighted funding approach and the size of the current weights are the result of a 1997 analysis conducted by the Ohio Department of Education's Office of Career-Technical and Adult Education. ODE contended that career-technical education costs more to provide than regular education.

LOEO had a number of concerns with the ODE analysis.

In examining this analysis, LOEO found numerous methodological errors and inconsistencies that call into question the validity of the current weights.

LOEO used multiple methods to analyze the cost of career-technical education.

LOEO analyzed the cost of career-technical education through a variety of methods, including: an inspection of teacher salaries and class size; multiple regression analysis; and a comparison of the funding practices in other states.

Teacher salaries

Career-technical education teacher salaries are not substantially higher than those for regular education.

Some advocates claim that higher salaries are required to obtain teachers with technical skills and experience. LOEO found that the salaries of career-technical education teachers are not substantially higher than those for regular education. In fiscal year 1997 there was a 3% difference in average salaries between career-technical and regular *high school* teachers, and a 5% difference when compared to *all* K-12 classroom teachers. LOEO also found that career-technical education teachers averaged 16 years' experience compared to 15 years for all regular education teachers.

Class size

Career-technical education class sizes are smaller than those in regular education.

Smaller class size is also cited as a reason for higher costs. LOEO's class size analysis found that, on average, career-technical classes were smaller (14.5 students) than regular education classes (19.5 students) in fiscal year 1997. While the difference in class size between regular and career-technical education was not as large as some advocates claim, there were, on average, five less students in career-technical classes.

Regression analysis

Only a subset of "high-cost" career-technical education courses within Workforce Development causes districts to spend more.

LOEO conducted a regression analysis to see if providing career-technical education to a greater proportion of their students caused school district to spend more. Overall, the regression analysis found that not *all* career-technical education courses impact district spending. In fact, there are only a *subset* of "high-cost" courses within the Workforce Development program area that are related to districts spending more. Offering courses in Work & Family Studies and Career-Based Intervention does not affect district spending.

Only 26% of full-time equivalent career-technical education students are enrolled in these "high-cost" courses.

Since only enrollment in these high-cost courses increases a school district's spending, this finding questions the appropriateness of 100% of full-time equivalent career-technical education students receiving supplemental funding. In addition, since only 26% of career-technical education students are enrolled in these high-cost courses, the use of the three program areas as the basis for the current funding weights does not accurately reflect the courses that cause districts to spend more.

Districts belonging to JVSDs spend, on average, less per pupil than other districts.

The regression analysis found that "where" career-technical education takes place also affects district spending. The 501 districts belonging to JVSDs spend, on average, less per pupil than the districts that do not belong to a JVSD. This finding suggests that JVSD-affiliated school districts enjoy "economies of scale." That is, they are able to offer educational services to *all* of their students less expensively than non JVSD districts.

This finding is supported by LOEO's analysis of career-technical education class sizes which found that JVSDs tend to have larger classes than singles or compacts, particularly for Workforce Development classes. Larger classes help bring about "economies of scale" by distributing costs across a greater number of students. This is the principal reason for creating JVSDs – to spread the cost of providing career-technical education across a greater number of students.

Other states

Among the nine states that use weighted funding for career-technical education, Ohio has the largest weights and the second highest base cost amount.

There is very little national research available on *how* career-technical education is funded. In fact, there are no studies available on the actual costs of providing career-technical education. LOEO commissioned a study that compared Ohio's funding approach to other states and found that Ohio earmarks a relatively large amount of funding for career-technical education.

For the nine states that use a weighted funding approach, Ohio's weights of 0.6 and 0.3 are among the largest. In addition, Ohio has the second largest base cost amount. The combination of Ohio's weights and higher base cost amount rank it among the largest state supporters of career-technical education.

Work & Family Studies and Career-Based Intervention courses are not considered "vocational education" courses in other states.

Furthermore, Ohio provides a supplemental weight for Work & Family Studies and Career-Based Intervention courses that other states do not define as "traditional" vocational education courses and therefore do not warrant additional funding. This is consistent with the regression finding that the percent of students in these courses has no impact on district spending.

Recommendations

LOEO found little evidence to support Ohio's current configuration of supplemental funding weights for career-technical education. There is no evidence to support the state providing 30% or 60% more funding for *all* career-technical education students. LOEO's analyses suggest that only a *subset* of career-technical education courses within the Workforce Development program area require districts to spend more. Only 26% of full-time equivalent career-technical education students are in these high-cost courses.

In order to confirm the findings of this study, career-technical education spending must be analyzed at a more detailed level than the current data permit. **If the Ohio General Assembly is interested in determining a more precise method for funding career-technical education,**

LOEO recommends the Ohio General Assembly:

Require ODE to form a working group to study whether specific vocational education **courses** warrant supplemental funding beyond that provided for regular education. This should be ***a one-time data collection effort*** that includes, prior to the start of the upcoming school year, clear guidelines on how selected districts should document their spending by course.

The working group should also determine if there are quality measures that can be used to select districts to include in the study. If there are no quality measures, a random, representative sample of school districts should be used.

The membership of this working group should include representatives from school districts, ODE, LOEO, and the Auditor of State.

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In conducting its study, LOEO encountered difficulties obtaining consistent data for career-technical education. In contrast to the amount and quality of the data available for city, local, and exempted village school districts, information regarding joint vocational school districts (JVSDs) is lacking.

In order to increase access to career-technical education data, which would improve accountability and better inform educational policy,

LOEO recommends that the Ohio Department of Education:

- Increase the amount and improve the quality of career-technical education data it reports.

Evaluation of Career-Technical Education Funding in Ohio

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Chapter I
Introduction

This Legislative Office of Education Oversight report describes Ohio's current system for providing and funding career-technical education and compares Ohio's funding method to those used in other states. The report also examines the basis for the current supplemental funding weights and offers recommendations for improving state policy regarding career-technical education funding.

Background

Career-technical education, formerly known as vocational education, has a long history in Ohio. Some Ohio public schools offered clerical and industrial courses as early as the late 1800s. The first cooperative programs with local industry were developed in Cincinnati in 1910. In 1917, the federal Smith-Hughes Act provided funds for federal and state cooperation in career-technical education. Ohio responded to this pivotal piece of legislation by providing state matching funds.

Ohio continued to expand its support by establishing vocational school districts. These districts existed as early as the 1940s, but they did not have the authority to tax until 1963 when the 105th General Assembly allowed them to operate as regular school districts.

By the end of the 1960s, Ohio solidified its commitment by requiring school districts to provide career-technical education. In 1969, the 108th General Assembly approved $75 million in state funds to match local funds to build joint vocational school buildings.

Over the years, career-technical education has grown beyond high school to include middle school and the post-secondary level. While students in elementary grades may participate in some type of career awareness, there are no *funded* career-technical education courses at the elementary level.

Currently, there are 13 state agencies that administer or support over 100 Workforce Development programs in Ohio. These programs range in both their size and scope. At one time, these agencies operated independently from one another, but they are now coordinated by the Governor's Workforce Policy Board. The Ohio Department of Education (ODE) administers approximately half of these programs, most of which pertain to middle and high school career-technical education. A complete list of these agencies is in Appendix A.

Context for the LOEO study

When the Ohio General Assembly revised its method for funding primary and secondary education in Ohio in 1998, it relied heavily upon the work of Dr. John Augenblick. In addition to calculating a new base cost amount, Dr. Augenblick recommended a new supplemental funding approach to account for factors shown to increase district spending beyond the base cost amount, such as special education and pupil transportation.

Dr. Augenblick's recommendation originated from an analysis of school spending conducted by the Ohio Department of Education (ODE) in consultation with Dr. Bruce Gensemer of Kenyon College. When

Dr. Gensemer completed this analysis in 1997, he found many factors that explained the differences in spending across Ohio school districts. In addition, he found two factors that did ***not*** increase district spending beyond the base cost amount – the percent of students enrolled in gifted education and the percent of students enrolled in career-technical education.

In response to this finding, the Office of Career-Technical and Adult Education of ODE conducted its own analysis in late 1997 to prove that there are higher costs associated with providing quality career-technical education. The analysis refuted the claim that career-technical education does *not* increase district spending. In fact, the Office of Career-Technical and Adult Education analysis found that districts spend considerably *more* on career-technical education and recommended a weighted-pupil funding mechanism for career-technical education to replace the existing "unit funding."

LOEO's legislative charge

The Ohio General Assembly initially declined to adopt the ODE recommendation for a weighted-pupil funding mechanism when revising its method for funding primary and secondary education in 1998. Instead, the Ohio General Assembly required the Legislative Office of Education Oversight (LOEO) to evaluate the funding of vocational education. The language included in Amended Substitute House Bill 650 of the 122nd General Assembly (February 1998) states:

"Not later than December 31, 2000, the Legislative Office of Education Oversight shall issue a report to the Ohio General Assembly that includes, but is not limited to, the following:

(A) An evaluation of state funding for vocational education, including state and local funding for joint vocational schools;

(B) An analysis of districts' vocational education costs;

(C) A recommendation for a mechanism for funding vocational education costs through a weighted-pupil mechanism or some other type of funding mechanism."

However, in 1999 the Ohio General Assembly adopted a weighted-pupil funding mechanism in Amended Substitute House Bill 282. To respond to the changes in career-technical education funding, the scope of this study encompasses the funding arrangements as specified in Am. Sub. H. B. 282. LOEO's study focuses primarily on "secondary" career-technical education which includes middle and high school, grades 7-12.

Methods

LOEO used multiple methods to examine career-technical education costs and to determine a new funding mechanism:

1. Reviewed over 50 documents, including journal articles, web sites, and reports of major studies regarding career-technical education and school funding. A selected bibliography is in Appendix B.

2. Interviewed state-level representatives from the Ohio Department of Education, Division of Policy, Research, and Analysis and the Division of Career-Technical and Adult Education; the Auditor of State; in addition to legislators and legislative staff.

3. Visited a total of seven school districts in the three different settings providing career-technical education. Interviewed district treasurers concerning the submission of career-technical education expenditures for ODE's cost analysis.

4. Examined the Ohio Department of Education's 1997 cost analysis that serves as the basis for the current weights for career-technical education.

5. Analyzed the year-end expenditure data submitted by school districts through the Education Management Information System (EMIS) as a means to either confirm the existing weights or to develop new weights.

6. Contracted with an independent research firm experienced in studying career-technical education to assess other states' approaches to funding career-technical education. The firm conducted a survey of all 50 states to provide policy recommendations for the State of Ohio.

7. Worked with an expert in the use of multiple regression analysis to develop various regression models to empirically examine the effect of career-technical education programming on school district spending.

Report organization

The next chapter of this report describes the delivery of secondary career-technical education in Ohio. Chapter III provides an overview of how career-technical education is funded through state, local, and federal resources. Chapter IV examines an ODE analysis of the cost of providing career-technical education. Chapter V presents the findings from various methods used by LOEO (to examine the cost of providing career-technical education) including an assessment of other states' approaches. LOEO's conclusions and recommendations are provided in Chapter VI.

Chapter II
Description of Career-Technical Education in Ohio

Career-technical education occurs in a variety of settings and is comprised of multiple programs and course offerings. This chapter provides an overview of the current system for delivering career-technical education instruction at the secondary level.

Career-technical education students

Career-technical education in Ohio typically begins in middle school when students are exposed to various careers, informed of the academic and technical skills they will need in order to pursue those careers, and begin the rudimentary steps of personal career planning. Once in high school, where the bulk of career-technical education occurs in the junior and senior year, students enroll in academic and occupationally-specific courses designed to prepare them for careers and post-secondary education upon graduation.

Career-technical education also extends to the post-secondary level for those high school students enrolled in Tech Prep. Tech Prep is a specialized set of academic and technical classes that students begin in their junior year of high school. After graduation, Tech Prep students migrate to a Tech Prep-affiliated institution of higher education where they pursue an associate's degree – building upon their high school course work. This report, however, focuses solely on career-technical education at the *secondary* level, including only the high school years of Tech Prep programs.

In fiscal year 1999, the Ohio Department of Education's (ODE) Office of Career-Technical and Adult Education reported approximately 345,000 middle and high school students enrolled in career-technical education programs in Ohio. This number represents a "head count" of *any* student taking at least one career-technical education course. This number translates into approximately 72,000 full-time equivalent (FTE) career-technical students.

Instructional settings

Under Ohio law, school districts are required to provide a minimum of 12 different career-technical course offerings and at least 20 career-technical classes. However, school districts enrolling 40% or more of their eligible students in career-technical education programs may be exempt from this rule and instead provide a minimum of 10 courses and 16 classes.

In order to meet these requirements, districts are allowed to join together to satisfy the career-technical needs of students. As such, there are three primary settings in which career-technical education occurs in the state.

1. **Joint Vocational School (JVS)** is a school *building* that specializes in career-technical education for juniors and seniors. Because most JVS students attend school there the entire day, JVSs offer "academic," along with career-technical coursework, in order to fulfill student graduation requirements. Students are transported to and from the JVS by their home school district.

   JVSs are constructed, maintained, and operated under the auspices of **Joint Vocational School Districts (JVSD)**. JVSDs are comprised of city, local, and exempted village school *districts* that join together to build and operate a joint vocational school building. JVSDs were

created as a way to spread the cost of providing career-technical education across several districts.

Similar to other school districts, JVSDs have their own school board, superintendent, and treasurer. JVSD boards are generally comprised of representatives from each member district. In those instances where the member district is a local school district, the Educational Service Center (ESC) to which the district belongs represents that district on the JVSD board. The ESC may, however, elect to have the local district represent itself.

In addition, JVSDs have the authority to issue bonds and levies pending approval by a majority of residents from member or "associate" school districts belonging to the JVSD. Currently, there are 49 JVSDs serving a total of 502 associate school districts.

Associate school districts belong to a JVSD, but they offer a select number of career-technical education courses in their own district. While sending some students to the JVSD, some associate school districts offer their own career-technical courses, such as business, marketing, and work and family studies, to the high school students remaining in the district. These courses are provided with the district's own resources or by teachers employed by the JVSD. Career-technical courses provided in the associate districts by a JVSD-employed teacher are referred to as "satellite" programs.

2. **Singles (independents)** are larger school districts that independently provide at least the minimum number of career-technical courses (12) and classes (20) required by law. In the case of single school districts, all career-technical instruction occurs within the district, though not necessarily in the building where the student takes his or her "academic" coursework. Currently, there are 28 single school districts, which are mainly urban districts.

3. **Compacts** are an arrangement formed by two or more school districts that do not have the student population or the financial capacity to independently provide a full array of career-technical courses. In compact arrangements, each school district specializes in a limited number of career-technical programs in which it enrolls its resident students, as well as those from other compact member districts. By specializing in different career-technical programs, districts belonging to a compact are able to offer the minimum of 12 career-technical courses and 20 career-technical classes required by law.

   Compact students typically divide their day into "academic" or career-technical courses. This arrangement can occur within the same building or the student may spend part of the day in a different setting. Compact districts work out the details among themselves for how students will be transported to and from member districts. There are 16 compacts comprising 78 school districts.

   Some school districts do not offer any career-technical courses and instead contract with another district to allow their students access to career-technical programs. Though similar to compacts, these arrangements are referred to as "**vocational contracts.**" Four districts

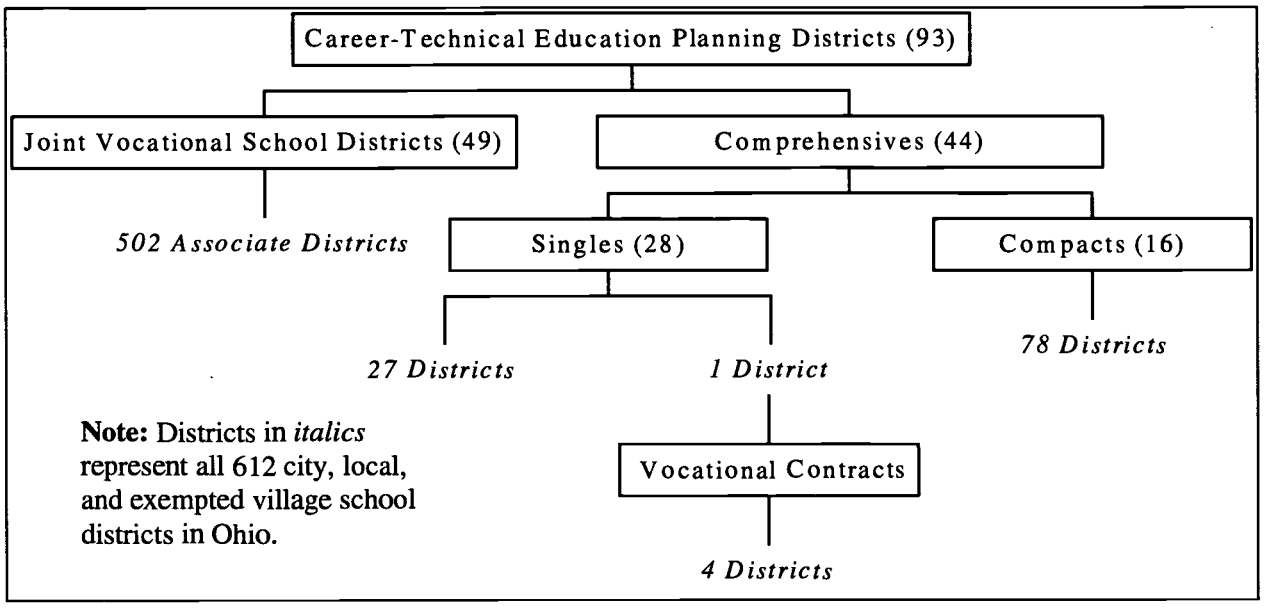
in the state contract with one "single" district for career-technical education. Single and compact districts are collectively referred to as "**comprehensives.**"

Administration

Each of the 49 JVSDs, 28 singles, and 16 compacts are grouped by ODE into Career-Technical Education Planning Districts (CTPD), formerly known as Vocational Education Planning Districts (VEPD). There are 93 Career-Technical Education Planning Districts in the state, each of which is guided by a "lead" district. Lead districts are responsible for coordinating career-technical education planning and data reporting for member districts. School districts partnered in a compact have one lead district. In the case of singles and JVSDs, each career-technical education planning district serves as its own lead district.

Exhibit 1 illustrates how career-technical education is currently organized in Ohio. Appendix C contains a map of career-technical education planning districts and the school districts they include.

Exhibit 1
Career-Technical Education Organization
Fiscal Year 2002



Source: Ohio Department of Education, Office of Career-Technical and Adult Education

Career-technical education program areas

Although most often associated with industrial trades such as carpentry and welding, career-technical education also includes courses from the service sector (e.g., cosmetology and culinary arts) to the high-tech sector (e.g., computer-assisted design and computer networking). Career-technical education courses at the secondary level are grouped into three main program areas: Workforce Development, Work & Family Studies, and Career-Based Intervention.

Workforce Development (WFD) are the academic and career-technical education courses intended to lead to high-skill and high-wage jobs. In fiscal year 2000, there were 85 courses offered within the Workforce Development program area. These courses are organized into six "clusters": arts and communication; business management; environmental and agricultural education; health careers; human resources and services; and industrial and engineering.

There is a broad range of courses offered within this program area. Specific examples of Workforce Development courses include horticulture, marketing, dental assistance, early childhood education and care, auto technology, aircraft maintenance, and culinary arts and food service management.

Academic Workforce Development courses – or integrated academic courses – include math, science, and English courses designed to teach traditional academic subjects through career-specific, hands-on applications. For example, an integrated math class would teach geometry by demonstrating its application in the field of carpentry or algebra by having students determine voltage based on a circuit's current (amps) and resistance (ohms).

It is important to note that integrated academic courses are more likely to be taught in joint vocational schools than in compact or single districts where career-technical students tend to take traditional academic courses.

Work & Family Studies (WFS) are courses designed to prepare students to make informed choices and to develop the knowledge and skills for responsible citizenship in family, community, and work settings. In fiscal year 2000, there were 12 course offerings focusing on such areas as family relations, nutrition and wellness, parenting, and personal development.

Career-Based Intervention (CBI) includes courses offered in both the academic and work-related areas. In fiscal year 2000, there were six course offerings in the traditional academic subjects of language arts, reading, mathematics, science, and social studies. In addition, there is a general Career-Based Intervention course that provides work-based learning experiences for students.

These courses are intended to help students who are at-risk of dropping out to improve academic competence, graduate from high school, develop employability skills, and prepare for post-secondary careers or higher education. These courses are offered to high school and some middle school students.

Programs that were previously labeled as Occupational Work Adjustment (OWA) and Occupational Work Experience (OWE) are under CBI. Courses within Career-Based Intervention range from single-period classes to half-days spent in an approved work setting.

A complete list of courses offered within each program area can be found in Appendix D.

Student enrollment

In fiscal year 2000, there were approximately 76,000 full-time equivalent (FTE) *secondary* students in career-technical education. ODE could not provide an "unduplicated" headcount of students for fiscal year 2000. Exhibit 2 displays the enrollment of these full-time equivalent students in the three program areas and in each setting.

Exhibit 2
Full-Time Equivalent Student Enrollment in Secondary Career-Technical Education by Setting and Program Area
Fiscal Year 2000

Settings	Program Areas			*Total (by setting)*
	Workforce Development (WFD)	Work & Family Studies (WFS)	Career-Based Intervention (CBI)	
Joint Vocational School Districts	27,838	8,765	6,296	***42,899***
Singles	8,369	3,055	2,009	***13,433***
Compacts	6,574	11,802	1,642	***20,018***
Total (by program)	***42,781***	***23,622***	***9,947***	***76,350***

Source: Ohio Department of Education, Office of Career-Technical and Adult Education, October 1999 EMIS data.

In terms of **setting**:

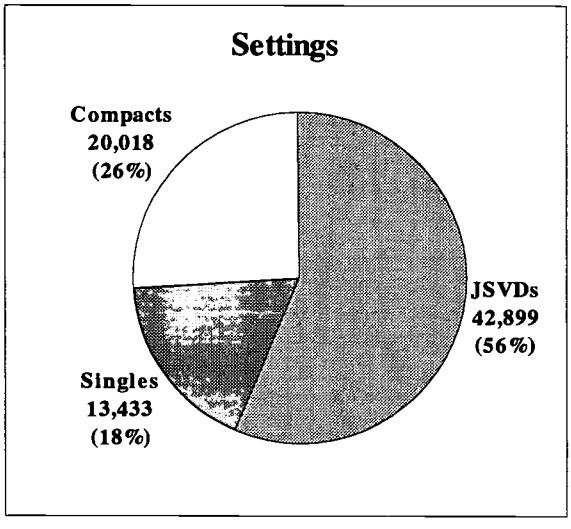
- 56% of FTE students were in JVSDs;
- 18% in singles; and
- 26% in compacts.

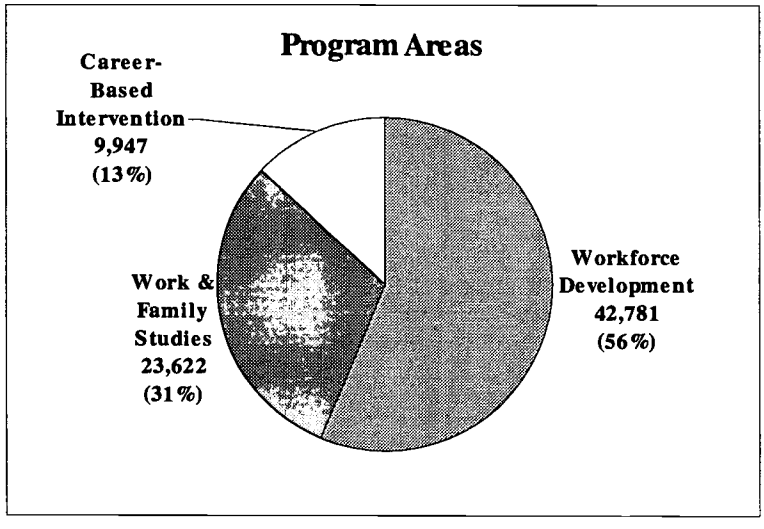
In terms of **program area**:

- 56% of FTE students were in Workforce Development;
- 31% in Work & Family Studies; and
- 13% in Career-Based Intervention.

Exhibit 3 illustrates these proportions.

Exhibit 3
Full-Time Equivalent Student Enrollment in Secondary Career-Technical Education by Setting and Program Area
Fiscal Year 2000





Furthermore, in terms of just the *Workforce Development* program area, full-time equivalent students are enrolled as follows:

- 65% in JVSDs;
- 20% in singles; and
- 15% in compacts.

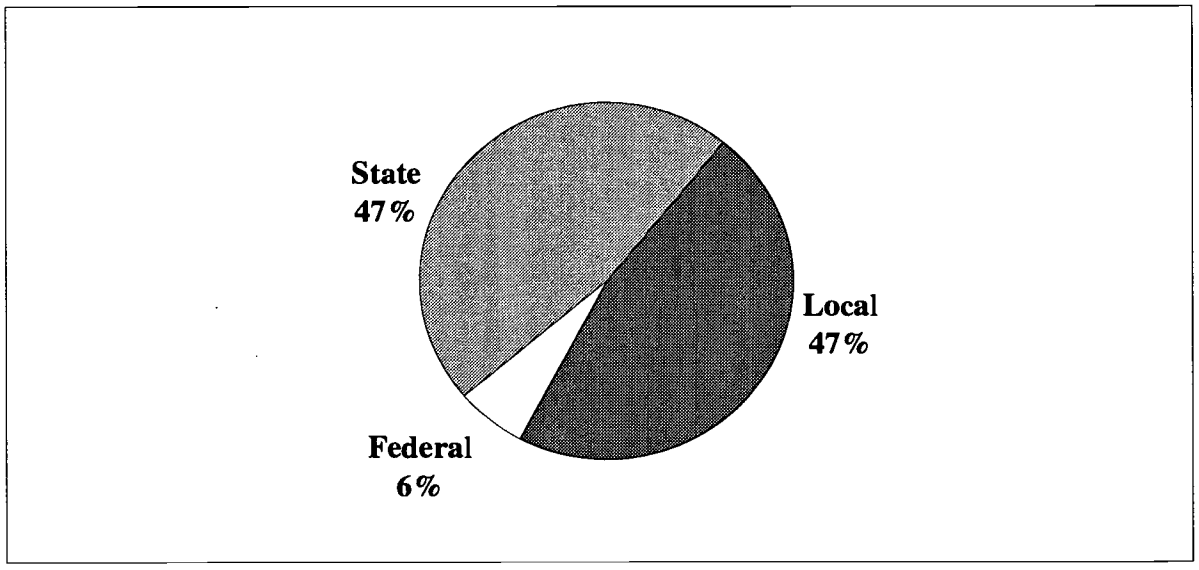
It is important to note that over 90% of career-technical education takes place in high school. For seventh and eighth grade students, nearly all participate in Work & Family Studies or Career-Based Intervention.

Chapter III
Description of Career-Technical Education Funding

Career-technical education funding comes from a combination of local, state, and federal resources. This chapter describes Ohio's funding mechanism and includes the impact of recent changes to the school funding formula.

Similar to regular education funding, the current method for funding career-technical education in Ohio is a state and local partnership. Career-technical education also receives a significant amount of federal funding, although this is a small percent compared to state and local resources. Exhibit 4 illustrates these percents. In fiscal year 2000, it is estimated that approximately $700 million in state, local, and federal funding was provided for career-technical education.

Exhibit 4
Percent of Career-Technical Education Funding from State, Local, and Federal Sources
Fiscal Year 2000



Source: Office of Career-Technical and Adult Education, Ohio Department of Education (July, 2001).

State Funding

The state provides the majority of its funding for career-technical education through two different line items within the biennial operating budget: base cost funding and vocational education enhancements. Within each line item, there are several programs or funding provisions.

Base cost funding (Line Item GRF 200-501)

In 1999, a weighted-pupil method for funding career-technical education was adopted in Am. Sub. H.B. 282, the operating budget of the 123rd General Assembly. Prior to the enactment of a weighted-pupil funding mechanism, career-technical education in Ohio was funded through "units."

A unit was considered a class with a minimum of 12 secondary students and 690 hours of instruction. In fiscal year 1998, the last year of unit funding for *all* districts, the average unit amount was $45,000. This amount included the state's minimum teacher salary (based on education and experience), 15% of the salary for fringe benefits, and a basic classroom allowance.

Because units were not funded on a per-pupil basis, they were not tied to the per-pupil base cost amount. As a result, career-technical education units did not receive the same yearly increases as regular education funding.

Weighted-pupil funding. Under the new method for funding career-technical education, each student generates the base cost amount ($4,052 in fiscal year 2000) plus a weighted amount for the portion of time spent in the three program areas – Workforce Development, Work & Family Studies, and Career-Based Intervention. The portion of time is translated into full-time equivalent (FTE) students for funding purposes.

Exhibit 5 displays the weights assigned to each of the three program areas as listed in Am. Sub. H.B. 282. These weights provide 30% and 60% more funding for each career-technical education full-time equivalent student enrolled in the program area. A detailed explanation of how the weighted formula works can be found in Appendix E.

Exhibit 5
Weighted Funding Levels for Career-Technical Education
Fiscal Year 2000

Program Areas	Funding Weight
Workforce Development (WFD) (includes integrated academic and Tech Prep courses)	0.60 x base cost amount
Work & Family Studies (WFS)	0.30 x base cost amount
Career-Based Intervention (CBI)	0.30 x base cost amount

Source: Ohio Revised Code, Section 3317.014.

LOEO attempted to report the increase in overall state funding for career-technical education between fiscal years 1999-2000 caused by the change from "units" to a weighted-pupil funding mechanism. However, this type of comparison was only available for JVSDs.

In fiscal year 1999, the last year for their units, JVSDs received a total of $144.8 million. In fiscal year 2000, the first year of weighted-pupil funding, JVSDs received a total of $159.8 million, a 10% increase in state funding.

With the June 2001 enactment of Amended Substitute House Bill 94 of the 124th General Assembly, the weights of 0.6 and 0.3 were lowered to 0.57 and 0.28, respectively. This adjustment was made to account for changes made to the cost-of-doing-business factor – an adjustment to the base cost amount to reflect regional cost differences in providing education. The purpose of lowering the weights was to provide districts a comparable level of career-technical education funding as that received when the previous cost-of-doing-business factor was used.

Am. Sub. H.B. 282 of the 123rd General Assembly, in combination with Ohio Administrative Code Section 3301-61-16, requires all school districts that receive supplemental (weighted) funding, and/or associated services funding, to spend those dollars *only* on career-technical activities approved by ODE. Districts are also eligible to receive a weighted per-pupil amount for students identified in any of the special education categories. Current Auditor of State guidelines further require that districts document how they are spending these career-technical education dollars and return to ODE any funds not spent.

Other base cost funding sources

In addition to the weighted-pupil funding, the state also supports career-technical programming with a number of other funding provisions – all of which are funded through the base cost funding formula.

Associated services. As previously stated, a "lead district" is designated for each of the 93 CTPDs to plan, evaluate, and provide career counseling and related services for the member districts. To help offset the costs of providing these associated services, lead districts receive an additional .05 weight for each career-technical student within their service areas.

School districts must also document the amount of the associated services funding they spend and return to ODE any funding that exceeds eligible costs. The Auditor of State monitors the use of these funds. To date, there has been only one case where these dollars have been returned.

25% supplement. The state provides supplemental funding to school districts that send students to JVSDs and compacts. Although the sending school district is not providing the instruction to these students, it is permitted to count 25% of full-time equivalent (FTE) career-technical students in its own ADM. For example, if a district sends 30.6 FTE students to a JVSD, 25% of these 30.6 students (7.65 students) are added to the ADM of the sending district.

The rationale for this supplemental funding is to help defray any additional transportation and coordination costs of sending career-technical students "out-of-district" to be educated. The 25% supplemental funding began in 1975.

Extended services. This is additional funding provided to school districts to supplement the cost of paying for staff whose services go beyond that of the regular school year (182 days). The state funding for extended services reimbursed districts approximately 7% of the actual cost of providing the program. Examples of staff services that qualified under this category of funding included summer school teachers, librarians, counselors, nurses, etc. Extended services funding was reduced by approximately half in fiscal year 2000 and was eliminated in fiscal year 2001.

Graduation, Reality, And Dual-Role Skills (GRADS). GRADS is an in-school instruction and intervention program for pregnant and parenting teens. Unlike the other three program areas, the primary method for funding GRADS continues to be units. These units are based on the number of full-time equivalent (FTE) *teachers*. In fiscal year 2000, one complete unit generated $45,000 in state funding. This amount was then adjusted to account for the relative wealth of the district employing the GRADS teacher.

GRADS teachers qualify for one complete unit of funding when they report at least 690 hours of combined in-class and out-of-class instruction for the current school year *and* have taught at least 36 GRADS students the previous school year. A lesser amount of instructional hours or students results in a reduced level of unit funding.

While GRADS is primarily funded through *teacher* units, a small portion of GRADS is funded on a per-pupil basis. GRADS classes in which the teacher reports less than 360 hours of instruction are funded on a per-pupil basis and receive a weight of 0.3 instead of a portion of a teacher unit.

According to the Office of Career-Technical and Adult Education, over 95% of the costs associated with providing GRADS are personnel-related. That is, the majority of the funding is used to pay teachers' salaries. In fiscal year 2000, there were a total of 7,978 students enrolled in GRADS courses; this represents a *headcount* of all students enrolled in the program. A total of FTE students enrolled in the program for fiscal year 2000 was not available. The majority of GRADS programs (66%) were in JVSDs that year.

Vocational education enhancements (Line Item GRF 200-545)

In addition to the base cost funding provisions, districts receive specific state funding for a number of career-technical education programs.

Jobs for Ohio Graduates (JOG). Created in 1987, this is a school-to-career transition program designed to assist "at-risk youth" (ages 14-21) complete their secondary education before transitioning into a job, post-secondary education, or the military. JOG encourages participants to explore career interests, acquire job-seeking skills, and increase their overall employability. Participants are also given the opportunity to participate in work-based learning activities such as job shadowing, mentoring, and work-place experience. Since 1991, JOG received the majority of funding (75%) from state revenue and the remainder (25%) from locally-generated resources. JOG is administered to districts on a grant basis through the Ohio Department of Education.

Tech Prep Consortia Grant Program. Combining the last two years of high school with a two-year associate degree, these programs stress mathematics, science,

communications, and technology. Tech Prep programs within schools are organized by 26 consortia in Ohio, involving 44 public colleges, universities, and regional campuses; all CTPDs; and more than 600 business, industry, and labor representatives. Tech Prep is the fastest growing career-technical program, with enrollment increasing from 607 students in 1995 to 10,820 students in 2000.

Tech Prep is funded through both state and federal resources. The Tech Prep Consortia Competitive Grants are used to support and expand the number of students enrolled in Tech Prep programs throughout the state. Students enrolled in Tech Prep are included in the Workforce Development program area and receive a 0.6 funding weight.

Individual Career Plan & Passport. Districts receive this grant funding to develop career plans, identify initial educational and career goals, and develop a "career passport" that provides a clear understanding of the student's knowledge, skills, and credentials to present to future employers, universities, and other training institutes.

Vocational education equipment replacement. Funding is provided to districts for the replacement of obsolete equipment used to train students for employment. Districts with a large percentage of disadvantaged students are given priority in the distribution of these funds. This was formerly a separate line item in the operating budget (GRF 200-526).

JVSD transitional funding. JVSDs with an adjusted recognized valuation per pupil equal to or less than $3 million are guaranteed to receive at least a 2.8% increase in state aid. This funding applied to fiscal year 2000 only. The purpose of this funding was to aid JVSDs transition from units to weighted-pupil funding.

Exhibit 6 provides a list of secondary career-technical education programs and provisions funded by the state for the fiscal year 2000 operating budget. Given the limitations of the data, LOEO had to combine *actual* and *allocated* amounts to **estimate** state funding provided to joint vocational school districts, compacts, and singles for career-technical education.

Exhibit 6
State Funding Provided to School Districts for Career-Technical Education
Fiscal Year 2000

		Fiscal Year 2000
GRF 200-501	**Base Cost Funding (actual allocation)**	
	Base Cost Funding (excluding guarantee funding)	$185,438,942
	Weighted Funding	$75,755,537
	Associated Services	$9,248,086
	25% Supplement	$19,025,597
	Extended Services	$592,569
	GRADS	$ 5,053,952
GRF 200-545	**Vocational Education Enhancements (appropriated)**	
	Jobs for Ohio Graduates (JOG)	$9,975,000
	Tech Prep Consortia Grant Program	$6,585,230
	Individual Career Plan & Passport	$6,144,277
	Vocational Education Equipment Replacement	$5,188,703
	JVSD Transitional Funding	$400,000
Total		***$323,407,893****

*Note: This amount is an **estimate** of the state career-technical education funding provided to single, compact, and joint vocational school districts for fiscal year 2000.

Additional funding provisions

Similar to regular education, there are provisions that also affect the amount of career-technical education funding received by districts, including JVSDs.

Guarantee. In February 1998, as a provision of the overall changes made in school funding, the 122nd General Assembly created the "guarantee" that school districts would receive at least the same amount of funding as in fiscal year 1998. Because compact and single districts received base cost funding and "grants" for career-technical education students instead of units in fiscal year 1999, they were guaranteed that their operating funds would not fall below their fiscal year 1998 level.

However, in fiscal year 1999, JVSDs continued to receive unit funding rather than base cost funding; therefore, they were not subject to the 1998 "guarantee." In fiscal year 1999, JVSDs received a substantial increase, approximately 8%, in total funding. ODE attributes this increase to more units provided for "non-instructional" teachers, such as Career Pathway Specialists, School-to-Work Coordinators, and Apprenticeship Coordinators.

ODE also speculated that the funding increase was due to an increase in the number of "satellite" programs. Satellite programs are courses that take place in the associate school districts, but are funded through the JVSD.

In fiscal year 2000, all singles, compacts, and JVSDs received base cost funding and the career-technical education funding weights. However, while compacts and singles were "guaranteed" their fiscal

year ***1998*** funding level, JVSDs were guaranteed their fiscal year ***1999*** funding level.

Because JVSDs received an unusually large increase in funding in fiscal year 1999, there were a substantial number on the "guarantee" in fiscal year 2000 – 14 out of 49 JVSDs. Furthermore, because the "guarantee" for JVSDs is based on a later year, JVSDs are assured a higher level of "guaranteed" funding than compact and single districts.

Cap. When the Ohio General Assembly revised its method for funding primary and secondary education in 1998, it placed a "cap" on the amount of increase in state aid that each school district was eligible to receive. The cap in state aid was either a 12% increase in total funding *or* a 10% increase in per-pupil funding, whichever was greater.

Similar to regular education, JVSD base cost funding was subject to the cap. In fiscal year 2001, approximately $4 million in base cost funding was subject to the cap for JVSDs. The last year for the cap was fiscal year 2001 for both regular school districts and JVSDs.

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Local Funding

In addition to state funding, local funding serves as a significant source of revenue (47%) for districts providing career-technical education. Local revenue is determined through two primary sources: the charge-off and levies.

Charge-off. The charge-off is the step in the base cost funding formula that considers the amount of local funding that a school district will contribute. For the 612 *regular* school districts, the charge-off is 23 mills. In its simplest form, the base cost funding formula assumes that each school district will contribute 23 mills times its assessed valuation to the *total base cost* of educating its students; state funding pays the remainder. In fiscal year 2000, the base cost funding formula produced an average state share of approximately 47% (excluding the guarantee) for regular school districts, which includes singles and compacts.

As noted, 49 JVSDs serve a total of 502 associate school districts. Based on negotiations between ODE and the Ohio General Assembly, the JVSD charge-off is 0.5 mills. The total assessed valuation of a JVSD is the sum of the total assessed valuation of *all* the associate school districts served by that JVSD. The relative low wealth of JVSD associate school districts results in JVSDs having a higher average state-share percentage than regular school districts. In fiscal year 2000, the average state share in base cost funding for JVSDs was approximately 67% (excluding the guarantee).

Tax issues. All 612 school districts can issue local tax levies for school operations or bonds for school construction and improvements, pending approval by a majority of district residents. Revenue raised through these local sources of funding may be used to benefit *any* type of educational program, including career-technical education.

JVSDs benefit from similar taxing and bonding authority. In order for levies to pass, they must be approved by a majority of voters within the associate districts comprising the JVSD. Unlike single and compact districts, however, local revenue generated by JVSDs is used exclusively on career-technical education. It is important to note that singles and compacts are not prohibited from issuing levies exclusively for career-technical education.

According to ODE, JVSDs had a total of 57 issues on the ballot between 1996 and 2001, with 31 passing. Issues ranged from 0.25 mills to 2.70 mills and included both operating levies and bond issues.

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Federal Funding

A final source of revenue for career-technical education is federal funding (6%). As stated, federal support for career-technical education dates back as far as 1917. The primary source of federal career-technical education funding is the Carl D. Perkins Vocational and Technical Education Act of 1998, also referred to as Perkins III. In order to receive federal funding, states must provide "matching" funds. In fiscal year 2000, approximately $2.3 million state dollars were appropriated through GRF 200-416 of the biennial operating budget for this purpose.

Once the state provides the matching funds, the Perkins III funds are separated into two grants: the Vocational Education Basic Grant and Tech Prep. The Vocational Education Basic Grant primarily funds *secondary* career-technical education programs and is administered by the Ohio Department of Education (ODE). The Tech Prep grant supplements the state funding for Tech Prep, and the funding is co-administered by ODE and the Ohio Board of Regents (OBR).

For the Vocational Education Basic Grant, a portion of these federal funds is used for state administrative purposes (5%) and leadership (10%) while approximately 70% is devoted to secondary career-technical education programs. The remaining 15% is dedicated to post-secondary education. Ohio receives approximately 10% of its Tech Prep Grant for administrative purposes with the remainder going to the 26 Tech Prep consortia throughout the state for programming. Exhibit 7 shows the federal funding for career-technical education in Ohio for fiscal years 2000 and 2001.

Exhibit 7
Federal Funding for Career-Technical Education
Fiscal Years 2000 and 2001

	Fiscal Year 2000	Fiscal Year 2001
Carl D. Perkins Vocational and Technical Education		
Vocational Education Basic Grant	$43,184,072	$44,682,695
Tech Prep Grant	$4,462,988	$4,449,520
Total	***$47,647,060***	***$49,132,215***

Chapter IV
Ohio Department of Education Vocational Cost Analysis

This chapter examines an Ohio Department of Education (ODE) cost analysis used by the Ohio General Assembly to implement a weighted per-pupil mechanism for funding career-technical education.

Background and methodology of ODE's cost analysis

In late 1997, the Ohio Department of Education's Division of Career-Technical and Adult Education performed an analysis of career-technical education expenditures to:

- Determine the per-pupil cost of providing "quality" career-technical education programs; and
- Have the Ohio General Assembly use this cost figure as the basis for distributing career-technical education funding to school districts.

The primary purpose of ODE's cost analysis was to prove that career-technical education costs more to provide than regular education, an assertion refuted by the research of Dr. Augenblick and Dr. Gensemer.

ODE modeled its analysis of career-technical education costs on the approach used by Dr. Augenblick to calculate Ohio's base cost amount for regular education. Similar to how Augenblick examined the actual expenditures of successful school districts to determine how much regular education should cost, ODE examined the expenditures of what it considered successful Career-Technical Education Planning Districts to determine the cost of career-technical education.

Just as Dr. Augenblick first eliminated high- and low-wealth school districts prior to his base cost calculations, ODE eliminated high- and low-cost Career-Technical Education Planning Districts prior to calculating the cost of a quality career-technical education. Next, ODE established six criteria for determining career-technical education quality and selected eighteen Career-Technical Education Planning Districts meeting at least five criteria for its cost analysis.

Treasurers from the lead school district of the selected planning districts were then asked to complete worksheets documenting all expenditures relating to career-technical education within their planning area. The worksheets were designed to account for vocational spending in the three main program areas of Workforce Development, Work & Family Studies, and Career-Based Intervention.

To arrive at a per-pupil cost of quality career-technical education for each program area, ODE:

- Summed the expenditures by each career-technical education program area for all Career-Technical Education Planning Districts that submitted worksheets;
- Subtracted spending for equipment since it is a capital good and it is funded through a different line item. (Augenblick

also factored out the cost of capital goods in his base cost calculations); and

- Divided the expenditures for each program area by the total number of full-time equivalent students receiving career-technical instruction within the planning district.

To ensure that each school district would have sufficient funding, ODE proposed the creation of supplemental funding weights for each program area (one weight for Workforce Development, and a second weight for both Work & Family Studies and Career-Based Intervention). The weights represented the percent above the base cost amount that districts seemed to be spending in order to provide "quality" career-technical education.

Exhibit 8 illustrates the recommended supplemental funding weights derived from ODE's 1997 cost analysis as well as the weights that were negotiated and ultimately adopted into law through Am. Sub. H.B. 282 of the 123rd General Assembly in 1999. These weights were adopted in combination with a relatively low charge-off level of 0.5 mills for JVSDs. (The lower the charge-off, the more the state pays.)

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Exhibit 8
ODE Recommended versus Ohio General Assembly Adopted Weights for Career-Technical Education

Vocational Program Area	Recommended by ODE 1997				Adopted by the Ohio General Assembly 1999 (Am. Sub. H.B. 282 123rd G.A.)
	Additional Vocational Spending from ODE Analysis		Base Cost*	Funding Weight	Funding Weight
Workforce Development	$3,474	/	$4,040 =	0.86	0.60
Work & Family Studies Career-Based Intervention	$2,384	/	$4,040 =	0.59	0.30

*Base cost amount as calculated by Augenblick and adjusted for inflationary growth of 2.8%.
Source: ODE Performance-based CTPD Expenditure Analysis; Section 3317.014 of Am. Sub. H.B. 282 of the 123rd General Assembly.

LOEO examination of ODE cost analysis

LOEO reviewed ODE's cost analysis to verify the evidence supporting the current funding weights. The purpose of LOEO's examination is not to imply that ODE *should* have used a quality-based approach.

However, since a quality-based approach was used, LOEO examined how it was applied.

In reviewing ODE's cost analysis, LOEO identified several methodological concerns with the way in which "quality" Career-Technical Education Planning Districts were selected for the analysis, as well as inconsistencies and errors in the reporting and analysis of the cost data. These concerns include:

- Inadequate indicators of what constitutes "quality" career-technical education programs;

- The exclusion of five Career-Technical Education Planning Districts whose expenditures should have been included in the analysis, but were omitted by mistake or lack of follow-up by ODE to obtain the needed data; and

- Inconsistencies and errors in treasurers reporting career-technical education expenditures across the Career-Technical Education Planning Districts included in the analysis.

In addition, ODE could provide no documentation regarding the number of career-technical education students and their associated expenditures, therefore, it was impossible for LOEO to verify ODE's cost calculations. These problems raise serious concerns regarding the accuracy of ODE's cost analysis and ultimately the appropriateness of the current weighted-pupil funding mechanism for career-technical education.

Inadequate indicators of quality career-technical programs. ODE used six criteria to identify what it considered successful Career-Technical Education Planning Districts. Those planning districts meeting at least five of the six criteria were deemed of sufficient quality to be included in the cost analysis. The six criteria used by ODE were:

1. *Post-program placement.* Placement of at least 95% of Workforce Development students in one of the following settings: employment, post-secondary education, or military service.

2. *Work Keys.* Proficiency level performance by at least 17% of Workforce Development students on the Work Keys assessment. Work Keys is a criterion-referenced test that measures applied academic skills needed for a variety of occupations.

3. *Student retention.* Loss of no more than five percent of Workforce Development students from career-technical programs.

4. *Career Passport.* Production of acceptable Career Passports by at least 75% of Workforce Development students. A Career Passport is a set of formal documents that identify and describe the skills a student has attained upon completing a career-technical program.

5. *Articulation of career goals.* Articulation of career goals by at least 75% of eighth grade students.

6. *Program offerings.* Provision of course offerings in all six career clusters of career-technical education courses. (The six career clusters are: arts and communication, business and management, environmental and agricultural systems, health services, human resources/services, and industrial and engineering systems.)

Although two out of the six criteria, post-program placement and student retention, serve to distinguish high-quality vocational programs from average- or low-quality programs, the remaining criteria are inadequate quality indicators for the following reasons:

- *The articulation of career goals and program offerings criteria fail to distinguish among Career-Technical Education Planning Districts.* An essential characteristic of any measurement of quality is its ability to distinguish among the entities being analyzed. LOEO found that 82% (77) of all 94 CTPDs met the minimum articulation of career goals threshold and 85% (80) offered courses in all six career clusters. Given that the vast majority of CTPDs met these two criteria, their value as quality indicators is limited.

- *Non-standard definition of an "acceptable" Career Passport.* The definition of what constitutes an acceptable Career Passport is determined locally by each school district, preventing meaningful comparisons.

- *The Work Keys is a voluntary test.* The only criterion of the six that is an actual assessment of career-technical knowledge is the Work Keys test. Unlike the Ohio Ninth Grade Proficiency Test, however, the Work Keys assessments are *voluntary*. In addition, students take a combination of different sections within the test. Some students take two sections while others take three sections.

  As such, the test provides no standard measurement of student performance across Career-Technical Education Planning Districts and is therefore not a measure of successful districts. Work Keys is no longer used as an assessment for secondary career-technical education students, as of the 2001-2002 school year.

In addition, none of the six criteria specifically measure the quality of Work & Family Studies and Career-Based Intervention courses. Yet, in fiscal year 1997, 41% of all vocational students were enrolled in Work & Family Studies and Career-Based Intervention courses.

Without adequate indicators of educational quality, a quality-based approach for examining career-technical education costs cannot be done, since the costs derived do not necessarily reflect the cost of a quality program. In the absence of defensible quality measures, the only valid method for selecting districts to include in the analysis is to examine the expenditures of *all* Career-Technical Education Planning Districts in the state or a random sample of these districts.

The exclusion of districts. According to data supplied by ODE, 22 Career-Technical Education Planning Districts met at least five of the six criteria and should have been included in ODE's cost survey. Yet, the expenditures of only 17 were analyzed. According to ODE, four Career-Technical Education Planning Districts that should have been included in the cost analysis were omitted by mistake. A fifth district failed to submit data on behalf of its members. Even within the 17 districts analyzed, not all member district expenditures were represented because they did not submit their expenditure data to the Career-Technical Education Planning Districts.

The exact effect of the unanalyzed districts on the cost analysis is unknown; their inclusion could have led to a

recommendation for higher *or* lower funding weights.

Inconsistencies and errors in the reporting of career-technical expenditures. The expenditure worksheets completed by treasurers and analyzed by ODE also cast doubts on the accuracy of ODE's cost analysis. Some examples of inconsistencies and errors in the reporting and analysis of expenditure data include:

- *Lack of consistent expenditure reporting.* Two treasurers whom LOEO interviewed stated that the instructions ODE provided for completing the cost analysis worksheets were vague and failed to specify commonly used Uniform School Accounting System (USAS) codes to identify expenditures. As a result of vague instructions, LOEO found that treasurers were inconsistent in their reporting of expenditures. For example, two treasurers included academic teachers in their instructional costs, while others only included career-technical instructors.

  In addition, several treasurers recorded the cost of their GRADS programs along with Work & Family Studies courses, while others included it as a separate line item. By including it in Work & Family Studies, expenditures related to this program area were inflated.

- *Lack of common instructions.* LOEO found that the instructions from ODE regarding the types of funds to include in the analysis changed over time as the worksheets districts used to provide cost data to ODE were submitted. As a result, half of the treasurers interviewed included expenditures from *federal funds* on their worksheets while the other half did not.

- *Inclusion of federal funds.* The inclusion of federal funds in a cost analysis to determine how much *state* support career-technical education should receive is inappropriate. The base cost amount, as calculated by Dr. Augenblick, excludes all expenditures from federal sources.

  Because the ODE cost analysis divides the per-pupil cost of career-technical education by the base cost amount to arrive at the various funding weights, the inclusion of federal funds inappropriately inflates the weighted amount. While the exact size of this inflation is unknown, the impact may not be negligible since federal funds comprise six percent of the total budget of secondary career-technical education in Ohio.

Insufficient documentation. Although ODE was cooperative in providing LOEO with many documents related to its cost analysis, the documents themselves failed to sufficiently describe how the cost analysis was conducted, making verification of its conclusions impossible. For example, several districts belonging to the Career-Technical Education Planning Districts analyzed by ODE failed to submit expenditure data. In response, ODE stated that it excluded the students from these districts in its career-technical expenditures per- pupil cost calculations. However, no documentation regarding the number of excluded students was provided, making it impossible to verify the accuracy of the per-pupil cost amounts reported by ODE.

On the expenditure side, ODE added a "prorated amount" of approximately $1,000 per FTE, on average, for administrative costs for each participating Career-Technical Education Planning District. Yet, an explanation of how this administrative cost was calculated is not documented and was

not clear to LOEO even after several interviews with ODE staff.

A final note

ODE's Office of Career-Technical and Adult Education reported to LOEO that its cost analysis was conducted in an extremely short amount of time (two months) in order to help inform the drafting of Am. Sub. H.B. 650 of the 122nd General Assembly in February 1998, the legislature's response to the Ohio Supreme Court's first *DeRolph* school funding ruling. (As it turned out, the Ohio General Assembly did not act on ODE's recommended funding weights until 18 months later date with the enactment of Am. Sub. H.B. 282 of the 123rd General Assembly in 1999).

While LOEO recognizes the constraints faced by ODE, the limitations of ODE's cost analysis raise enough concerns about the study's validity to call into question its use as the basis for determining the current 0.6 and 0.3 weights, providing 60% or 30% more supplemental funding for *all* full-time equivalent career-technical education students.

Chapter V
LOEO Career-Technical Education Cost Analysis

This chapter presents the findings of several approaches used by the Legislative Office of Education Oversight to assess career-technical education costs.

Using multiple approaches, LOEO intended to determine how and by what amount career-technical education *should* be funded in Ohio. These approaches included:

1. Examination of commonly-cited reasons for high career-technical education costs;

2. Examination of specific components of school district spending on career-technical education to confirm the magnitude of existing weights or to develop new weights;

3. Examination of aggregate school district spending on career-technical education, using multiple regression analysis; and

4. Comparison of Ohio's approach to funding career-technical education to approaches used by other states.

Commonly cited reasons for higher career-technical education costs

Some advocates claim that career-technical education is more expensive to provide than other forms of instruction for three commonly cited reasons: higher teacher salaries, smaller class sizes, and the purchase and maintenance of career-technical education equipment.

LOEO examined each of these factors to determine the extent to which they may contribute to higher costs for career-technical education.

Higher teacher salaries. Some advocates claim that in order to compete with the private sector, school districts hire career-technical education teachers at a higher salary than "regular" education teachers to compensate for their technical skills and experience. This argument pertains to the high school level where nearly all of the occupationally-specific courses are offered.

In comparing teacher salaries, LOEO found, on average, that the salaries of career-technical education teachers are not substantially higher than those for regular education. In fiscal year 1997, the average salary for career-technical education teachers was $40,927 compared to $39,855 for regular education teachers at the *high school* level, and $38,811 for *all* classroom teachers. This represents a 3% difference in salaries between career-technical and regular *high school* teachers, and a 5% difference between career-technical and *all* K-12 classroom teachers.

LOEO also found that career-technical education teachers averaged 16 years' experience compared to 15 years for all regular education teachers in 1997. This could explain the differences in salaries.

Small class sizes. Some advocates also cite smaller class size as a reason for the increased costs for career-technical education. Because state funding for these courses begins in middle school, LOEO compared the average class size for grades 7-

12 between regular education and career-technical education for the 1996-1997 school year.

LOEO's analysis found that, on average, career-technical classes were smaller (14.5 students) than regular education classes (19.5 students). Within the program areas, Career-Based Intervention classes were the *smallest*, on average, with 11.5 students. Work & Family Studies classes, in contrast, were the largest with an average of 16.2 students. Workforce Development classes average 13.5 students. These comparisons are displayed in Exhibit 9.

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Exhibit 9
Class Size Comparison between Regular and Career-Technical Education
Grades 7-12
1996-1997 School Year

	Average Class Size
Workforce Development (WFD)	13.5
Work & Family Studies (WFS)	16.2
Career-Based Intervention (CBI)	11.5
Career-technical education grades 7-12	**14.5**
Regular education grades 7-12	**19.5**

Source: EMIS Course Master and Student Course files, fiscal year 1997.

While the difference in class size between regular and career-technical education was not as large as some advocates claim, there were, on average, five less students in career-technical classes.

In addition, LOEO found that Workforce Development classes provided at JVSDs were larger, on average (14.4 students), than those taught in compacts (11.5 students) and singles (12.9 students).

Equipment. Expensive equipment purchases are often cited as contributing to the high cost of career-technical education. In recognition of this additional cost, Ohio has historically funded the purchase of equipment separately from operating expenses, which generated the weights. Therefore, expensive equipment is not an argument for supplemental weights.

LOEO expenditure analysis

Given the concerns regarding the consistency and reliability of ODE's 1997 cost study, LOEO attempted to determine the cost of career-technical education through a separate analysis. Unlike the ODE study, which relied on district treasurers to supply cost data through self-administered worksheets, LOEO focused on specific components of year-end expenditures submitted by districts to the Education

Management Information System (EMIS). The purpose of this analysis was to either confirm the existing weights for career-technical education or to develop new weights.

LOEO attempted to separate various components of career-technical education expenditures from regular and special education for all three types of career-technical districts – compacts, singles, and JVSDs. By isolating various components of expenditures, LOEO intended to focus exclusively on non-capital, operating expenses that were paid with state and local funding.

Once the necessary career-technical education expenditures were isolated, LOEO intended to estimate the cost for the three program areas – Workforce Development, Work & Family Studies, and Career-Based Intervention. With the costs isolated, weights could be determined based on the proportion of spending for each program area. However, throughout the course of this study, LOEO encountered numerous obstacles that prevented the expenditures from being isolated accurately for this type of detailed analysis.

Inability to isolate career-technical education spending. The current reporting requirements of the EMIS make it impossible to isolate career-technical education expenditures – especially for compact and single districts.

Because compacts and singles provide a full range of educational services beyond career-technical education, it is nearly impossible to isolate the portion of a district's total spending that exclusively pertains to career-technical education. For example, a single or compact district reports expenditures for "student support services," such as guidance counseling or health services, for all students. There is no distinction for what portion of these expenditures is spent on regular, special, or career-technical education students.

Numerous examples of this type of "co-mingled data" occur throughout the expenditure reports. While it is somewhat easier to isolate career-technical education spending for joint vocational school districts, given their primary focus on career-technical education, these same issues affect the quality of their data as well.

Lack of course-level spending. Determining the cost of career-technical education by each of the three program areas – Workforce Development, Work & Family Studies, and Career-Based Intervention – requires that school districts report *all* expenditures related to providing these programs at the *course* level.

However, districts are not required to report expenditures by course level; therefore, LOEO was unable to determine the amount that is actually spent within each program area. The lack of course-level expenditures makes it impossible to estimate the costs associated with providing the Workforce Development, Work & Family Studies, and Career-Based Intervention programs.

The inability to isolate career-technical education expenditures, combined with the lack of course-level expenditures by program area, prevented LOEO from analyzing the year-end expenditures of school districts on career-technical education. LOEO was therefore unable to confirm the validity of the existing weights or to develop new weights.

Multiple regression analysis

As mentioned, a 1997 analysis done by Dr. Bruce Gensemer for the Ohio Department of Education, found that the percent of career-technical education students in a district does not influence overall district spending. The analytical tool used by Dr. Gensemer to reach his conclusions was multiple regression analysis, a widely used statistical technique that examines whether some circumstances (or factors) influence another.

For example, multiple regression has been used by school funding researchers to examine whether the average family income or the percent of students with disabilities influences how much money a school district spends per pupil.

Regression analysis allows the examination of relationships using aggregated school district expenditures. Using aggregate expenditures can be a more accurate way to study the cost of a program even when inconsistent coding produces inaccurate detailed-level data. In other words, even though the detailed-level data are not consistently reported, the overall spending amounts can still be accurate.

The regressions performed by Dr. Gensemer in 1997 (using data from the fiscal year 1996), found 17 different factors that explained approximately 80% of the differences in spending across Ohio school districts. Two of those factors, the percent of students with disabilities and the percent of students in poverty, justify state policies that provide supplemental special education and Disadvantaged Pupil Impact Aid (DPIA) funding to school districts.

One factor that Dr. Gensemer found that was *unrelated* to district spending was the percent of career-technical education students in a district. When using multiple regression analysis to compare the percent of career-technical education students in each school district to that district's total spending, Dr. Gensemer found no pattern to suggest that higher percentages of career-technical education students were associated with overall higher district spending.

In order to see if we could find evidence to support supplemental weights, LOEO contracted with Dr. Gensemer to *rerun* the multiple regression analyses he performed in 1997 using some additional and more precise career-technical education factors, including:

- The *percent* of students in Workforce Development, Work & Family Studies, Career-Based Intervention, or GRADS as four separate factors;
- The *percent* of students in high-, medium-, and low-cost career-technical education *courses*;
- The *percent* of students in districts attending a JVSD;
- Whether a district *belonged* to a career-technical education compact; and
- Whether a district *belonged* to a JVSD.

LOEO focused on revising the 1997 regressions to look again at the relationship between career-technical education and district spending. The regression analysis is based on fiscal year 1996 data, in order to focus on spending that occurred ***prior*** to districts receiving supplemental funding weights for career-technical education.

LOEO findings for district spending. In conducting this more precise regression analysis, LOEO found the following:

- The percent of career-technical education students in a district is ***unrelated*** to overall district spending;

- The percent of career-technical education students enrolled in the Workforce Development program area has ***no effect*** on district spending. (These students currently receive a weight of 0.6). In other words, the regression analysis found no pattern to suggest that districts with a relatively high proportion of Workforce Development students spend more to educate these students than their regular education students.

- The percent of career-technical education students enrolled in the Work & Family Studies and Career-Based Intervention program areas also has ***no effect*** on district spending. (These students currently receive a weight of 0.3).

Although some individual school districts may spend more on career-technical education, there is no statewide pattern of increased spending. The regression analysis would be able to detect a pattern of increased spending *of any size* if the pattern existed.

Because districts currently receive an additional 30% or 60% for students enrolled in the three program areas, LOEO looked for other factors that might influence district spending on career-technical education to justify the existence of these supplemental weights.

LOEO requested a former career-technical education superintendent, with over 25 years of experience, to categorize each career-technical *course* offered in fiscal year 1996 into what he considered either high-, medium-, or low-cost categories. Some examples of courses within each of these cost categories include:

- High-cost courses: auto collision repair and cosmetology;

- Medium-cost courses: marketing and food science; and

- Low-cost courses: family relations and business English.

The purpose of this ranking was to see if an alternative grouping of career-technical education *courses* might show that career-technical enrollment does impact district spending, although not related to the three program areas upon which the current weights of 0.6 and 0.3 are based. Appendix F describes the variables used in the regression analysis and lists the high-, medium-, and low-cost courses.

Exhibit 10 displays how courses in the three program areas are represented in the high-, medium-, and low-cost categories for fiscal year 1996. It also reports the full-time equivalent students enrolled in these courses. (The number of courses by program area in Exhibit 10 are different from the current number of courses reported in Chapter II due to changes in course offerings since 1996.)

Exhibit 10
Allocation of Career-Technical Education Courses and Students in Three Program Areas Across High-, Medium-, and Low-Cost Categories
Fiscal Year 1996

Program Areas	Cost Category	Courses		FTE Students	
		Number	%	Number	%
Workforce Development	**High**	**52**	**42%**	**17,379**	**26%**
	Medium	42	34%	17,435	26%
	Low	19	15%	5,135	8%
	Subtotal	*113*	*91%*	*39,949*	*60%*
Work & Family Studies	Medium	2	2%	2,151	3%
	Low	6	5%	13,857	21%
	Subtotal	*8*	*7%*	*16,008*	*24%*
Career-Based Intervention	Medium	3	2%	6,870	10%
	Low	1	1%	4,547	7%
	Subtotal	*4*	*3%*	*11,417*	*17%*
Total		***125***	***101%****	***67,375***	***101%****

Source: Ohio Department of Education, Division of Career-Technical and Adult Education, October 1995 EMIS Data and LOEO consultant rankings.
*Note: Percentages do not equal 100% due to rounding error.

Although *all* high-cost courses are within the Workforce Development program area, the majority of Workforce Development courses were not identified as high cost. That is, the high-cost courses are only a *subset* of courses currently classified in the Workforce Development program area, 52 of 113. Furthermore, only 26% of the full-time equivalent career-technical education students are in these high-cost courses.

The regression analysis found that:

- The percent of students in high-cost courses ***does*** impact overall district spending; and
- The percent of students in medium- and low-cost courses ***does not*** impact district spending.

In sum, the regression analysis suggests that not *all* career-technical education courses impact district spending. In fact, there are only a *subset* of courses, within the Workforce Development program area, that cause districts to spend more.

In effect, the current funding system, which is based on student enrollment by *program area*, results in *100%* of career-technical education students receiving a supplemental weight. However, if supplemental funding were based on student

enrollment in *courses* demonstrated to impact district spending, approximately *26%* of career-technical education students would receive a supplemental weight.

The finding that only enrollment in high-cost courses increases a district's spending calls into question the appropriateness of using the three program areas as the basis for the current funding weights. During the course of this study, LOEO learned from the Ohio Department of Education that the decision to use the three program areas as the basis for weighted funding was made prior to ODE's cost analysis. ODE "suspected" that Workforce Development cost more, but they had no evidence to support this assumption. They believed that it would be easier to fund by program area than course.

LOEO findings for JVSD and compact membership. It appears that "where" career-technical education takes place also affects district spending. The updated regressions show that the 501 associate districts belonging to JVSDs spend, on average, less per pupil than the 28 single districts spend. This finding suggests that JVSD-affiliated school districts enjoy "economies of scale" relative to singles. That is, they are able to offer educational services to *all* of their students less expensively than non-JVSD districts.

This finding supports the principal reason for creating JVSDs – to spread the cost of providing career-technical education among a greater number of students. This finding is supported by LOEO's analysis of career-technical education class sizes which found that JVSDs tend to have larger classes than singles or compacts, particularly for Workforce Development classes. The updated regressions did not show, however, that districts belonging to compacts enjoy similar economies of scale.

LOEO findings for GRADS. The updated regressions also show that having a relatively high percent of students enrolled in GRADS courses causes districts to spend more. While not identified as "high-cost," LOEO speculates that the small number of students enrolled in GRADS courses, which fluctuates from year to year, impacts district spending.

LOEO findings for high school. The updated regressions found that the percent of students enrolled in high school *does* impact district spending. It costs districts more to educate students in high school (grades 9-12) than grades K-8. This higher cost applies to all high school students, including career-technical education students.

This finding is supported by research literature that states high school is more costly than grades K-8 for the following reasons:

- Teachers at the high school level are more "specialized" and teach fewer subjects. As a result, high schools must hire more teachers than elementary schools where teachers have more "general" backgrounds and teach multiple subjects;
- High school courses, such as chemistry and physics, which often require labs are more costly to provide; and
- High school classes are generally smaller than those in grades K-8.

It is important to note, however, that the higher cost of providing high school was taken into account when the Ohio General

Assembly revised its method of determining a base cost funding amount for elementary and secondary education in 1998.

For JVSDs that serve only high school students, the regression analysis found that JVSD-affiliated school districts enjoy "economies of scale," therefore, they are able to offer educational services to *all* of their students less expensively than non JVSD-affiliated districts.

Career-technical education funding approaches in other states

In order to compare Ohio's method of funding career-technical education to approaches used by other states, LOEO contracted with MPR Associates, an independent research firm experienced in studying the field of career-technical education. MPR researchers contacted representatives from a number of national agencies, including the Office of Vocational and Adult Education of the U.S. Department of Education, the National Association of State Directors of Vocational Education Consortium, and the American Vocational Information Association to learn about the methods other states use to fund career-technical education and the amount that they contribute.

Information gathered from these discussions confirmed LOEO's assessment that there is very little national research available on *how* career-technical education is funded. In fact, there are no studies available on the actual costs of providing career-technical education. As a result, MPR Associates resorted to surveying all 50 states to learn about each state's approach to funding career-technical education. It is important to note that MPR's analysis focused exclusively on funding approaches and did not compare the *quality* of programs.

MPR Associates learned that, although the level of career-technical education funding is most often based on historical precedent or political compromise, there are some patterns. They found that states use four general approaches to funding career-technical education:

- Unit funding;
- Foundation grant programs;
- Weighted funding; or
- Performance-based funding.

Exhibit 11 shows the number of states that used each method of funding in fiscal year 2001. A detailed description of each approach is provided in Appendix G.

Exhibit 11
State Approaches to Funding Career-Technical Education
Fiscal Year 2001

Funding Approach	Number of States
Unit funding	29
Foundation grants	10
Weighted funding	9
Performance-based funding	2
Total	***50***

Ohio relative to other states

Compared to other states, Ohio earmarks a relatively large amount of funding for career-technical education. For the nine states that use a weighted funding approach, Ohio's weights of 0.6 and 0.3 are among the largest. In addition, Ohio has the second largest base cost amount. As a result, when the larger weight is multiplied by a relatively large base cost amount, the overall level of funding is higher. Exhibit 12 displays the funding amounts for states using a weighted funding approach for fiscal year 2001.

Exhibit 12
States Using a Weighted Funding Mechanism
for Career-Technical Education
Fiscal Year 2001

	Base Cost Amount (Fiscal Year 2001)	Weight	Base Cost and Weighted Career-Technical Funding per FTE*
Ohio	**$4,294**	**0.30 or 0.60**	**(either) $5,582 or $6,870**
Illinois	$4,425	0.30 or 0.50	(either) $5,753 or $6,638
Indiana	$4,267	0.14 to 0.48	(from) $4,864 to $6,315
Kansas	$3,820	0.50	$5,730
Alaska	$3,940	0.20	$4,728
Texas	$2,537	0.37	$3,476
Louisiana	$3,020	0.05	$3,171
Georgia	$2,243	0.20	$2,696
South Carolina	$2,012	0.29	$2,595

*Base Cost and Weighted Career-Technical Funding per FTE = Base Cost Amount + (Base Cost Amount x Weight). Additional adjustments, which include supplemental payments to districts for poverty, at-risk students, school size, local effort, transportation, and facilities are not reflected in these amounts.

MPR Associates found that most states fund career-technical education between 20% and 40% higher than regular education instruction, while Ohio funds career-technical education between 30% and 60% higher than regular education.

Ohio's weights and higher base cost amount rank it among the largest state supporters of career-technical education. It is important to note that Ohio's weight of 0.60, the Workforce Development weight which yields approximately $6,870 per full-time equivalent student (FTE), is applied to the majority of all secondary career-technical education FTE students (56% in fiscal year 2000).

MPR Associates found that while the weight of 0.30 used for Work & Family Studies and Career-Based Intervention programs is closer to the weights used in other states, the type of instruction in these program areas does ***not*** parallel that of traditional vocational programs in other states. Courses offered in the Workforce Development program area are most consistent with courses labeled as "vocational education courses" in other states.

Specifically, instruction in the Work & Family Studies and Career-Based Intervention program areas focuses on broad career themes, such as personal development or employability skills, which may be relatively cheaper to provide than other forms of vocational instruction. In fact, ODE staff reported that the cost of supplying and equipping these two program areas may be *significantly* less than the cost for the more "traditional" vocational courses offered in the Workforce Development program area.

The finding by MPR Associates that courses within the Work & Family Studies and Career-Based Intervention program areas may be less expensive to provide than courses found within the Workforce Development program area supports the regression finding that the percent of students in these medium- to low-cost courses ***does not*** impact district spending. In fact, MPR Associates speculates using program areas as the basis for providing weights may result in Ohio *overfunding* some career-technical courses and *underfunding* others.

Furthermore, MPR Associates reports that the site of career-technical education instruction – singles versus joint vocational school districts – may affect the cost of providing career-technical education. That is, joint vocational school districts, by design, should be able to provide career-technical education services to a larger number of students than singles, leading to a cost savings. This finding also supports the regression finding that districts belonging to a joint vocational school district spend less per pupil than singles.

To determine the appropriate level of Ohio's career-technical education funding requires an analysis of career-technical education expenditures. As noted, the Education Management Information System (EMIS) does not collect the necessary detailed data to perform this type of analysis. At a minimum, MPR Associates suggests that efforts be undertaken to collect the necessary level of data that will allow the state to quantify the actual cost of providing career-technical education. In addition to calculating the overall cost of career-technical education, this type of analysis will also identify which, if any, courses are either "over" or "under" funded.

Chapter VI
Conclusions and Recommendations

This final chapter presents LOEO's conclusions and recommendations regarding the state funding of career-technical education at the secondary level.

Summary

Career-technical education in Ohio typically begins in middle school and continues through high school, where the bulk of career-technical education occurs. High school career-technical education courses are offered in a variety of settings, including joint vocational school districts (JSVDs) where instruction focuses almost exclusively on career-technical education.

Career-technical education courses are currently grouped into three program areas for state funding purposes: Workforce Development, Work & Family Studies, and Career-Based Intervention. For each full-time equivalent (FTE) student in Workforce Development courses, school districts receive state funding equal to 60% more than the base cost amount. For each FTE student in Work & Family Studies or Career-Based Intervention courses, school districts receive state funding equal to 30% more than the base cost amount.

ODE cost analysis

The basis of the current per-pupil supplemental funding weights of 0.6 and 0.3 was the result of an analysis conducted by the Ohio Department of Education's (ODE) Office of Career-Technical and Adult Education in 1997. In examining this analysis, LOEO found numerous methodological errors and inconsistencies that call into question the validity of the findings. As a result, the accuracy and validity of the current career-technical funding weights must be questioned as well.

LOEO's examination of career-technical education costs

LOEO analyzed the cost of career-technical education through a variety of methods, including: an inspection of teacher salaries and class size; multiple regression analysis; and a comparison of the funding practices in other states. LOEO also tried to confirm the existing weights or develop new weights by examining spending data in the Education Management Information System (EMIS). LOEO found, however, that the data were not available to isolate the spending on career-technical education, nor to separate the spending by the three program areas of Workforce Development, Work & Family Studies, and Career-Based Intervention.

Teacher salaries. LOEO found, on average, that the salaries of career-technical education teachers are not substantially higher than those for regular education. In fiscal year 1997, the average salary for career-technical education teachers was $40,927 compared to $39,855 for regular education teachers at the *high school* level, and $38,811 for *all* classroom teachers. This represents a 3% difference in salaries between career-technical and regular *high school* teachers, and a 5% difference between career-technical and *all* K-12 classroom teachers. LOEO also found that career-technical education teachers averaged 16 years' experience compared to 15 years for all regular education teachers in 1997.

Class size. Smaller class size is also cited as a reason for higher costs. LOEO's class size analysis found that, on average, career-technical classes were smaller (14.5 students) than regular education classes (19.5 students) in fiscal year 1997. While the difference in class size between regular and career-technical education was not as large as some advocates claim, there were, on average, five less students in career-technical classes.

Regression analysis. Overall, LOEO's updated regression analysis found that not *all* career-technical education courses impact district spending. In fact, there are only a *subset* of courses, all within the Workforce Development program area, that are related to districts spending more. Courses within Work & Family Studies and Career-Based Intervention do not affect district spending.

Since only enrollment in these high-cost courses increases a school district's spending, this finding questions the appropriateness of 100% of full-time equivalent career-technical education students receiving supplemental funding. In addition, since only 26% of career-technical education students are enrolled in these high-cost courses, the use of the three program areas as the basis for the current funding weights does not accurately reflect the courses that cause districts to spend more.

The updated regression analysis found that "where" career-technical education takes place also affects district spending. The 501 school districts belonging to JVSDs spend, on average, less per pupil than the districts that do not belong to a JVSD. This finding suggests that JVSD-affiliated school districts enjoy "economies of scale." That is, they are able to offer educational services to *all* of their students less expensively than non JVSD districts.

Similarly, the study of other states found that JVSDs, by design, may be able to provide career-technical education services to a larger number of students than comprehensives and, therefore, produce a cost savings.

This finding is supported by LOEO's analysis of career-technical education class sizes which found that JVSDs tend to have larger classes than singles or compacts, particularly for Workforce Development classes. Larger classes help bring about economies of scale by reducing the number of teachers needed to serve students. This is the principal reason for creating JVSDs – to spread the cost of providing career-technical education across more students.

LOEO's updated regressions also show that the percent of students enrolled in GRADS courses causes districts to spend more.

Other states. Compared to other states, Ohio earmarks a relatively large amount of funding for career-technical education. For the nine states that use a weighted funding approach, Ohio's higher weights of 0.6 and 0.3 are among the largest. In addition, Ohio has the second largest base cost amount. The combination of Ohio's weights and higher base cost amount rank it among the largest state supporters of career-technical education.

Furthermore, Ohio provides a supplemental weight for Work & Family Studies and Career-Based Intervention courses that other states do not define as "traditional" vocational education and that do not warrant additional funding. These courses may be less expensive to

provide. This is consistent with the regression finding that the percent of students in these courses has no impact on district spending.

Conclusions and recommendations

LOEO found little evidence to support Ohio's current configuration of supplemental funding weights for career-technical education. There is no evidence to support the state providing 30% or 60% more funding for *all* career-technical education students. LOEO's analyses suggest that only a *subset* of career-technical education courses within the Work Force Development program area require districts to spend more. Only 26% of full-time equivalent career-technical education students are in these high-cost courses.

In order to confirm the findings of this study, career-technical education spending must be analyzed at a more detailed level than the current data permit. **If the Ohio General Assembly is interested in determining a more precise method for funding career-technical education,**

LOEO recommends that the Ohio General Assembly:

Require ODE to form a working group to study whether specific career-technical education **courses** warrant supplemental funding beyond that provided for regular education. This should be ***a one-time data collection effort*** that includes, prior to the start of the upcoming school year, clear guidelines on how selected districts should document their spending by course.

The guidelines developed by this working group should include but not be limited to, methods for uniformly:

- Coding career-technical education expenditures by course;
- Prorating fixed and shared costs (e.g., utility and administrative costs); and
- Using the actual cost data to derive appropriate weights for new groups of career-technical education courses.

LOEO's analysis examined district spending prior to the advent of weights. In order for the working group to acquire more precise and uniformly coded data, these guidelines have to be established before the new data are collected for the next school year, fiscal year 2003. Since the weighted-pupil funding mechanism has provided additional state dollars for career-technical education since fiscal year 2000, the working group should also examine the appropriateness of districts' increased spending. In other words, given that districts have more state dollars to spend, the working group should review how districts are spending these additional dollars.

The working group should also determine if there are quality measures that can be used to select districts to include in the study. If there are no quality measures, a random, representative sample of school districts should be used.

Although LOEO is recommending a one-time data collection effort to determine appropriate weights, the working group should also consider how their procedures could be used for periodic updates in the future. The membership of this working group should include representatives from school districts, ODE, LOEO, and the Auditor of State.

In conducting its study, LOEO encountered difficulties obtaining consistent data for career-technical education. In contrast to the amount and quality of the data available for city, local, and exempted village school districts, information regarding JVSDs is lacking. While fiscal data for regular school districts, such as revenue sources and annual spending per pupil are readily available through each district's Local Report Card, these statistics are no longer reported for JVSDs. Currently, these data can only be obtained through special requests.

In order to increase access to career-technical education data, which would improve accountability and better inform educational policy,

LOEO recommends that the Ohio Department of Education:

Increase the amount and improve the quality of career-technical education data reported. Examples of specific data include:

- Revenue sources and annual spending per pupil for JVSDs;
- Career-technical education enrollments by grade level and type of course;
- Number, salary, and experience levels of career-technical instructors; and
- Career-technical education-specific revenue and expenditure reports.

APPENDICES

Appendix A
State Agencies Providing Workforce Development Programs

In September 1999, the Governor's Workforce Policy Board was created to assist various state agencies' efforts toward systemic workforce development. The state agencies included on this Board that support workforce development programs are as follows:

1. Ohio Board of Regents
2. Ohio Bureau of Workers' Compensation
3. Ohio Department of Aging
4. Ohio Department of Alcohol and Drug Addiction Services
5. Ohio Department of Development
6. Ohio Department of Education
7. Ohio Department of Job and Family Services
   (formerly Ohio Bureau of Employment Services and Ohio Department of Human Services)
8. Ohio Department of Mental Health
9. Ohio Department of Mental Retardation and Developmental Disabilities
10. Ohio Department of Natural Resources
11. Ohio Department of Rehabilitation and Correction
12. Ohio Department of Youth Services
13. Ohio Rehabilitation Services Commission

Appendix B
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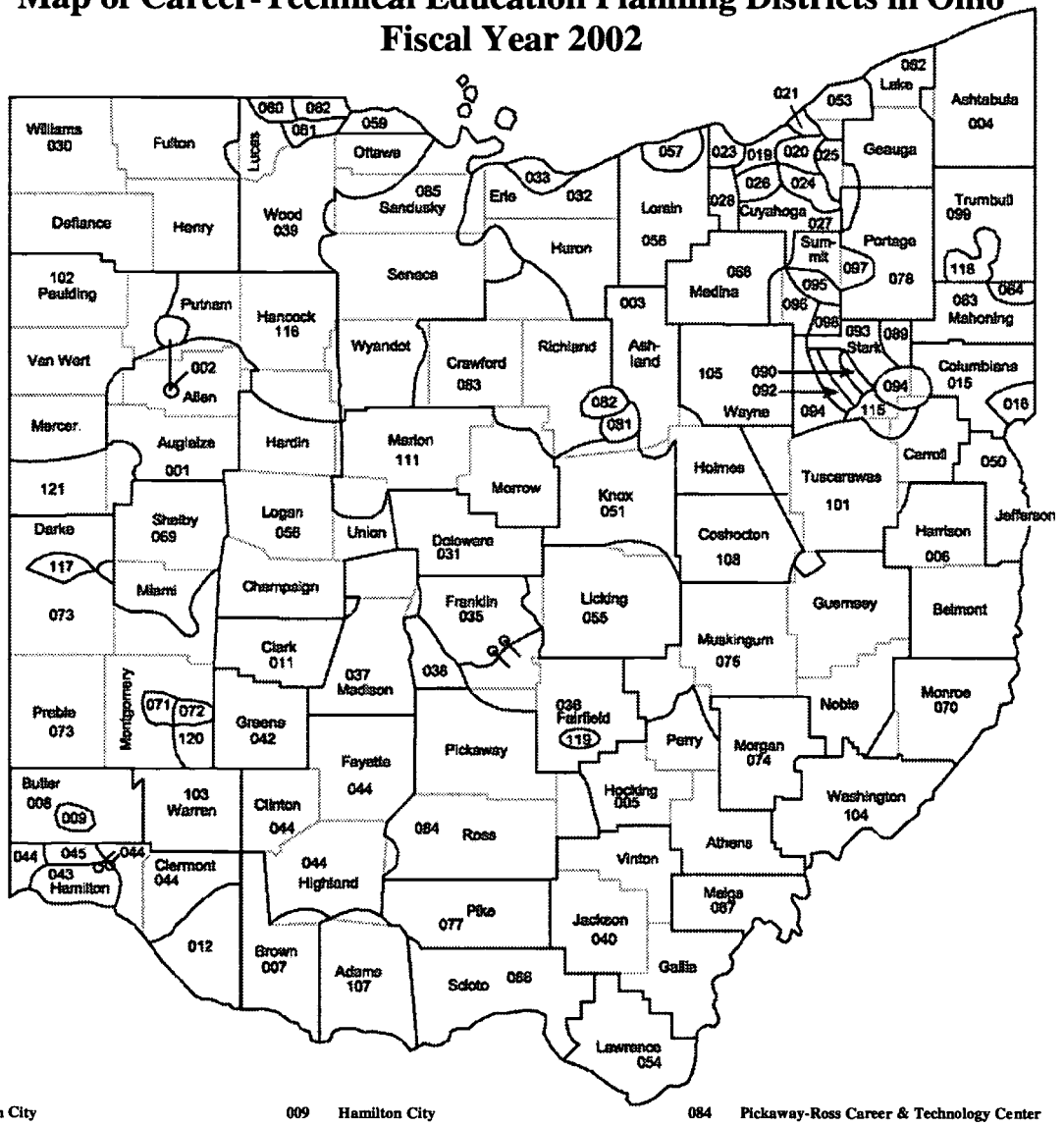
Appendix C
Map of Career-Technical Education Planning Districts in Ohio
Fiscal Year 2002



095	Akron City	009	Hamilton City	084	Pickaway-Ross Career & Technology Center
089	Alliance City	050	Jefferson County JVSD	077	Pike County JVSD
001	Apollo JVSD	051	Knox County JVSD	083	Pioneer Career Technology Center
003	Ashland Co./West Holmes JVSD	053	Lakeshore Compact/Mentor Exempted Village	093	Plain Local
004	Ashtabula County JVSD	023	Lakewood City	028	Polaris JVSD
052	Auburn JVSD	119	Lancaster City	098	Portage Lakes JVSD
024	Bedford/Maple Heights City	054	Lawrence County JVSD	033	Sandusky City
006	Belmont-Harrison Area JVSD	055	Licking County JVSD	086	Scioto County JVSD
101	Buckeye JVSD	002	Lima City	097	Six District Compact
008	Butler County JVSD	057	Lorain City	007	Southern Hills JVSD
090	Canton City	058	Lorain County JVSD	038	South Western City
115	Canton Local	118	Lordstown Local	011	Springfield-Clark County JVSD
120	Centerville City	081	Madison Local	094	Stark County JVSD
037	Central Ohio JVSD	072	Mad River Local	070	Switzerland of Ohio Local
043	Cincinnati City	063	Mahoning County JVSD	060	Sylvania City
019	Cleveland Municipal School District	082	Mansfield City	061	Toledo City
015	Columbiana County JVSD	078	Maplewood Career Center	005	Tri County JVSD
035	Columbus City	092	Massillon City	020	Tri Heights Career Prep Consortium
108	Coshocton County JVSD	025	Mayfield Excel Tech. Ed. CC	111	Tri Rivers JVSD
027	Cuyahoga Valley JVSD	066	Medina County JVSD	121	Tri Star Career Compact
071	Dayton City	067	Meigs Local	099	Trumbull Career & Technology Center
031	Delaware JVSD	073	Miami Valley Career Technology Center	069	Upper Valley JVSD
021	East Cleveland City	075	Mid-East Ohio JVSD	012	U.S. Grant JVSD
036	Eastland-Fairfield Career Technical School	116	Millstream Career Cooperative	085	Vanguard-Sentinel JVSD
016	East Liverpool City	074	Morgan Local	102	Vantage Career Center
032	EHOVE JVSD	045	Northwest Local	103	Warren County JVSD
096	Four Cities Compact	056	Ohio Hi-Point JVSD	104	Washington County JVSD
030	Four County JVSD	107	Ohio Valley Local	062	Washington Local
040	Gallia-Jackson-Vinton JVSD	059	Oregon City	105	Wayne County JVSD
044	Great Oaks Institute of Technology	026	Parma City	064	Youngstown City
042	Greene County Career Center	039	Penta County JVSD		
117	Greenville City				

Source: Ohio Department of Education, 2001.

Appendix D
Career-Technical Education Courses
Fiscal Year 2000
N=101

Workforce Development (6 clusters, 85 courses)

Arts and Communications (4 courses)

- Arts and Communication Foundation
- Commercial Art Occupations
- Entertainment Marketing
- Graphic Occupations

Business and Management (14 courses)

- Accounting
- Administrative/Office Technology
- Business Administration and Management
- Business and Management Foundation
- Business Information Systems
- Computer Support Technology (Tech Prep)
- Culinary Arts and Food Service Management
- Distribution and Warehousing
- Family and Consumer Sciences Multi-Area Coop
- Fashion, Clothing and Interiors, Production and Services
- Hotels and Resorts
- Marketing
- Marketing Management
- Travel and Tourism Marketing

Environmental and Agricultural Systems (12 courses)

- Agriscience
- Animal Production and Care
- Equine Management

(Environmental and Agricultural Systems, cont.)

- Zoo Animal Production and Care
- Agribusiness
- Agricultural Industrial Equipment
- Environmental Management
- Food Science
- Horticulture
- Natural Resources
- Other Agriculture
- Production Agriculture

Health Occupations (21 courses)

- Certified Health Unit Coordinator (Tech Prep)
- Community Health Aide
- Dental Assisting
- Dental Laboratory Technology
- Diversified Cooperative Health Occupations (DCHO)
- Diversified Health Occupations (DHO)
- Fitness Aide/Athletic Trainer Assistant
- Foundation for Health Professions
- Health Unit Coordination
- Home Health (Aide) Assisting
- Medical Assisting
- Medical Laboratory Assisting
- Nurse Assisting
- Optometric Occupations
- Patient Care Technician
- Pharmacy Technician
- Phlebotomy
- Phlebotomy (Tech Prep)

(Health Occupations, cont.)

Practical (Vocational) Nursing
Pre-Nursing (Tech Prep)
Surgical Technology

Human Resources and Services (5 courses)

Cosmetology
Criminal Justice
Early Childhood Education and Care
Firefighter Training
Human Resources/Services Foundation Course

Industrial and Engineering (27 courses)

Air Conditioning, Heat and Refrigeration Technician
Aircraft Maintenance
Appliance Repair
Auto Collision Repair
Auto Specialization
Auto Technology
Business Machine Maintenance

(Industrial and Engineering, cont.)

Carpentry
Commercial Art Occupations
Commercial Photography Occupations
Custodial Services
Drafting Occupations
Electrical Trades
Ground Operations
Heavy Equipment (Construction)
Industrial and Engineering Systems Foundations
Industrial Maintenance and Repair Occupations
Manufactured Home Servicing
Marine Maintenance
Maritime Occupations
Masonry
Medium/Heavy Truck Technician
Painting and Decorating
Plumbing and Pipefitting
Power Transmission
Resilient Floor Installation
Workforce Readiness Program

Work & Family Studies (12 courses)

Family Relations
GRADS Alternative Structure
GRADS Class Structure
GRADS Minimum Intervention/Follow-up
Impact
Life Planning
Life Planning/Mentorship
Middle School Work and Family Life
Nutrition and Wellness
Personal Development
Resource Management

Career-Based Intervention (CBI) (6 courses)

Career Based Intervention
CBI Language Arts
CBI Reading
CBI Mathematics
CBI Science
CBI Social Studies

Appendix E
Description of Distribution of the Weighted Funding Formula for Career-Technical Education Funding

In June 1999, Amended Substitute House Bill 282 of the 123rd General Assembly created weights that, when multiplied by the base cost amount, would represent the added per pupil cost to districts of providing career-technical education. For the Workforce Development program area, the weight set by H.B. 282 was 0.6 per full-time equivalent (FTE) student. For the Work & Family Studies and Career-Based Intervention program areas, the weight was set at 0.3 per FTE student.

With the enactment of Am. Sub. H.B. 94 of the 124th General Assembly, the weights of 0.6 and 0.3 weights were lowered to 0.57 and 0.28, respectively. This change was made to account for adjustments made to the cost-of-doing-business factor, which adjusts the base cost amount to reflect regional cost differences in providing education. The purpose of lowering the weights was for districts to receive a comparable level of career-technical education funding had the previous cost-of-doing-business factor been used.

The following table illustrates how the weights adopted in Am. Sub. H.B. 94 are used to generate state funding for a hypothetical school district with 170 full-time equivalent career-technical students in different programs and a state share of 50%.

Calculation of Base Cost and Weighted Funding (A Hypothetical School District)

Program Area	Number of Students FTEs	Weight	Base Cost Amount FY 2002	Base Cost and Weighted Funding	State Share	Total Base Cost and Weighted Funding Provided by State
	A	B	C	D = A x B x C	E	F = D x E
Work Force Development (WFD)	100	.57	$4,814	$274,398	50%	$137,199
Work & Family Studies (WFS)	50	.28	$4,814	$67,396	50%	$33,698
Career-Based Intervention (CBI)	20	.28	$4,814	$26,958	50%	$13,479
Total Base Cost and Weighted Funding				***$368,752***		***$184,376***

Appendix F
Regression Analysis

This appendix describes the variables used in the Legislative Office of Education Oversight's (LOEO) regression analysis; explains the problems in obtaining accurate data from the Ohio Department of Education (ODE) to run the regressions; and lists the "high-," "medium-," and "low-" cost courses identified by the LOEO career-technical education consultant.

Regression analysis

Dependent variable. The dependent variable in LOEO's regression analysis is "total adjusted expenditures per pupil by each district" as represented by the following formula:

$$\frac{\text{Total fiscal year 1996 non-capital expenditures of district minus transportation expenditures and federal revenue.} + \text{Total fiscal year 1996 non-capital expenditures of Joint Vocational School Districts (JVSDs) — minus transportation expenditures and federal revenue (prorated back to member districts based on each district's percent of JVSD student).} + \text{Total fiscal year 1996 non-capital expenditures of Educational Service Centers (ESCs) — minus transportation expenditures and federal revenue (prorated back to member districts based on each district's percent of students served by the ESC).} + \text{Total fiscal year 1996 non-capital expenditures of Data Acquisition Sites (A-Sites) — minus transportation expenditures and federal revenue (prorated back to member districts based on each district's percent of students served by the A-Site).}}{\text{Annual ADM of the district for fiscal year 1996*}}$$

*Annual ADM includes students served by JVSDs and ESCs.

Transportation was removed from LOEO's dependent variable due to the wide variability in transportation expenditures across districts. Federal revenue, a proxy for federal expenditures, was also removed in order to isolate local and state spending. (These same adjustments were made in Dr. Gensemer's original 1997 regressions.)

Independent variables. The following table describes the independent variables in the LOEO regression analysis. The variables listed in bold were statistically significant at the 95% confidence interval.

Independent Variables	Source
Average county wage	U.S. Census Bureau, 1994
Percent of pupils on ADC	ODE Office of School Finance, average of FY 1994, 1995, and 1996 ADC counts
Percent of pupils on ADC in the following six districts: Akron, Cincinnati, Cleveland, Columbus, Dayton, and Toledo	ODE Office of School Finance, average of FY 1994, 1995, and 1996 ADC counts
Percent of pupils in level 1 disability category: Developmentally Handicapped, Other Health Handicapped, and Learning Disabled	Educational Management Information System (EMIS) December Count, December 1995
Percent of pupils in level 2 disability category: Multi-handicapped, Hearing Impaired, Visually Handicapped, Orthopedically Handicapped, and Severe Behavior Handicapped	EMIS December Count, December 1995
Percent of pupils in level 3 disability category: Deaf-Blind, Autistic, and Traumatic Brain Injured	EMIS December Count, December 1995
Percent of pupils in grades 9 –12	EMIS Student Demographic file, October 1995
Average high school size	EMIS Student Demographic file, October 1995
Average high school size squared	EMIS Student Demographic file, October 1995
Federal income per pupil in thousands	Ohio Department of Taxation, 1996 Income Tax Returns By School District
Class 2 valuation per pupil in thousands	ODE Office of School Finance, FY 1996
Tangible valuation per pupil in thousands	ODE Office of School Finance, FY 1996
Percent of population with a Bachelor (BA) degree	U.S. Census Bureau, 1990
Per-pupil prorated total state revenue*	EMIS Receipt Record, FY 1996
Percent of pupils in all vocational courses regardless of program area**	ODE Office of Career-Technical and Adult Education, Course File FY 1996
Percent of pupils attending a JVSD	ODE Office of School Finance, JVS ADM Report FY 1996
Percent of pupils enrolled in courses in the Career-Based Intervention program area**	ODE Office of Career-Technical and Adult Education, Course File FY 1996
Percent of pupils enrolled in Graduation Reality and Dual Role Skills – GRADS course**	ODE Office of Career-Technical and Adult Education, Course File FY 1996
Percent of pupils enrolled in courses in the Workforce Development program area**	ODE Office of Career-Technical and Adult Education, Course File FY 1996
Percent of pupils enrolled in courses in the Work & Family Studies program area**	ODE Office of Career-Technical and Adult Education, Course File FY 1996
District is member of a compact	ODE Office of Career-Technical and Adult Education, Course File FY 1996
District is member of a JVSD	ODE Office of Career-Technical and Adult Education, Course File FY 1996

Independent Variables	Source
Percent of students in high cost vocational courses**	ODE Office of Career-Technical and Adult Education, Course File FY 1996 and consultant rankings
Percent of students in medium-cost vocational courses**	ODE Office of Career-Technical and Adult Education, Course File FY 1996 and consultant rankings
Percent of students in low-cost vocational courses**	ODE Office of Career-Technical and Adult Education, Course File FY 1996 and consultant rankings

*Includes JVSD state revenue prorated back to member districts based on each district's percent of JVSD expenditures.

**Includes JVSD students enrolled in these courses prorated back to member districts.

Problems in obtaining accurate data

Central to LOEO's regression analysis is the proration back to school districts of Joint Vocational School District (JVSD), Data Acquisition Site (A-Site), and Educational Service Center (ESC) expenditures for services rendered on behalf of each district's students. In fiscal year 1996, these prorations were performed by the Ohio Department of Education (ODE) staff and reported for each district as "total adjusted expenditures" in the School District Profiles appearing on ODE's website. After working with these data for some time, LOEO discovered that ODE had failed to properly prorate back to districts $62,668,201 in JVSD expenditures. According to ODE, this error was the result of districts resubmitting fiscal year 1996 data as late as fiscal year 1998. ODE did not update the expenditure figure that appeared on their website to reflect these resubmitted data.

Uncertain as to whether the data that made up the independent variables had been properly updated, LOEO requested that ODE provide new up-to-date fiscal year 1996 data for both the dependent and independent variables in order to rerun the regressions. As a result of this additional data request and the work involved in rerunning the regression analysis, the LOEO report was delayed considerably.

The categorization of vocational courses

Upon finding that overall enrollment in career-technical education, and enrollment in the three program areas of Workforce Development, Work & Family Studies, and Career-Based Intervention were statistically unrelated to overall district spending, LOEO attempted to see whether an alternative grouping of career-technical education courses might justify supplemental funding. Using a list of the career-technical education courses offered in fiscal year 1996, Dr. Larry Graser (an LOEO consultant with expertise in career-technical education and administration) placed each course into one of three categories of "high-," "medium-," or "low-cost." Only those courses categorized as "high-cost" proved to be statistically significant. The courses and their cost categories are listed below.

Cost Category	Cluster	Course Title	EMIS Course Code
High	Agriculture	Agricultural Industrial Equipment	010300
High	Agriculture	Equine Management	010131
High	Agriculture	Horticulture	010500
High	Agriculture	Production Agriculture	010104
High	Agriculture	Forestry	010700
High	Business	Computer Support Technology (Tech Prep)	144820
High	Family & Consumer Sciences	Culinary Arts and Food Service Management	090203
High	Family & Consumer Sciences	Early Childhood Education and Care	090201
High	Health	Dental Assisting	070101
High	Health	Dental Laboratory Technology	070103
High	Health	Medical Assisting	070904
High	Health	Medical Laboratory Assisting	070203
High	Health	Nurse Assisting	070303
High	Health	Optometric Occupations	070603
High	Health	Surgical Technology	070305
High	Tech & Industrial	Aircraft Maintenance	170401
High	Tech & Industrial	Appliance Repair	170200
High	Tech & Industrial	Auto Collision Repair	170301
High	Tech & Industrial	Auto Specialization	170303
High	Tech & Industrial	Auto Technology	170302
High	Tech & Industrial	Aviation Occupations	170400
High	Tech & Industrial	Business Machine Maintenance	170600
High	Tech & Industrial	Carpentry	171001
High	Tech & Industrial	Commercial Photography Occupations	170900
High	Tech & Industrial	Cosmetology	172602
High	Tech & Industrial	Criminal Justice	172802
High	Tech & Industrial	Drafting Occupations	171300
High	Tech & Industrial	Electrical Trades	171002
High	Tech & Industrial	Electronics	171503
High	Tech & Industrial	Engineering Technology (Tech Prep)	171801
High	Tech & Industrial	Graphic Occupations	171900
High	Tech & Industrial	Heating, Air Conditioning, and Refrigeration Technician	170100
High	Tech & Industrial	Heavy Equipment (Construction)	171003
High	Tech & Industrial	Heavy Metal Fabrication	172304
High	Tech & Industrial	Industrial Laboratory Assisting	172004
High	Tech & Industrial	Industrial Maintenance and Repair Occupations	171012

Cost Category	Cluster	Course Title	EMIS Course Code
High	Tech & Industrial	Manufactured Home Servicing	171016
High	Tech & Industrial	Manufacturing Engineering Technology (Tech Prep)	171802
High	Tech & Industrial	Marine Maintenance	170802
High	Tech & Industrial	Maritime Occupations	170801
High	Tech & Industrial	Masonry	171004
High	Tech & Industrial	Medium/Heavy Truck Technician	171200
High	Tech & Industrial	Millwork and Cabinet Making	173601
High	Tech & Industrial	Plastics Occupation	172700
High	Tech & Industrial	Plumbing and Pipefitting	171007
High	Tech & Industrial	Power Equipment Technology	173100
High	Tech & Industrial	Power Transmission	171402
High	Tech & Industrial	Precision Machining	172302
High	Tech & Industrial	Sheet Metal	172305
High	Tech & Industrial	Telecommunications	171504
High	Tech & Industrial	Tool and Die Making	172307
High	Tech & Industrial	Welding and Cutting	172306
Medium	Integrated Academic	Advance Placement -Biology	139904
Medium	Integrated Academic	Advance Placement -Chemistry	139906
Medium	Integrated Academic	Advance Placement -Physics	139928
Medium	Integrated Academic	Applied Science	130101
Medium	Integrated Academic	Biological Science	130200
Medium	Integrated Academic	Chemistry	130301
Medium	Integrated Academic	Physical Science	130300
Medium	Integrated Academic	Physics	130302
Medium	Agriculture	Agribusiness	010200
Medium	Agriculture	Agriscience	010100
Medium	Agriculture	Animal Production and Care	010101
Medium	Agriculture	Environmental Management	010699
Medium	Agriculture	Food Science	010400
Medium	Agriculture	Natural Resources	010600
Medium	Agriculture	Other Agriculture	019900
Medium	Business	Accounting	140100
Medium	Business	Administrative/Office Technology	140300

Cost Category	Cluster	Course Title	EMIS Course Code
Medium	Business	Business Administration and Management	140800
Medium	Business	Business Information Systems	140200
Medium	Business	Job Training Coordinating Unit	990371
Medium	Career-Based Intervention	Occupational Lab	179998
Medium	Career-Based Intervention	Occupational Work Experience (OWE)	179999
Medium	Career-Based Intervention	Vocational Adjustment Lab	179996
Medium	Family & Consumer Sciences	Family and Consumer Sciences Multi-Area Coop	090290
Medium	Family & Consumer Sciences	Fashion, Clothing and Interiors, Production and Services	090202
Medium	Family & Consumer Sciences	Hotels and Resorts	090205
Medium	Health	Certified Health Unit Coordinator (Tech Prep)	074890
Medium	Health	Community Health Aide	070906
Medium	Health	Diversified Cooperative health Occupations (DCHO)	079960
Medium	Health	Diversified Health Occupations (DHO)	070998
Medium	Health	Fitness Aide/Athletic Trainer Assistant	070410
Medium	Health	Pharmacy Technician	070912
Medium	Health	Practical (Vocational) Nursing	070302
Medium	Health	Pre-Nursing (Tech Prep)	074830
Medium	Marketing	Distribution and Warehousing	041900
Medium	Marketing	Entertainment Marketing	040115
Medium	Marketing	Marketing	040800
Medium	Marketing	Marketing Management	040810
Medium	Marketing	Travel and Tourism Marketing	041118
Medium	Tech & Industrial	Building and Property Maintenance	171011
Medium	Tech & Industrial	Commercial Art Occupations	170700
Medium	Tech & Industrial	Custodial Services	171100
Medium	Tech & Industrial	Diversified Cooperative Training (DCT)	179960
Medium	Tech & Industrial	Fire Fighter Training (paid)	172801
Medium	Tech & Industrial	Painting and Decorating	171005
Medium	Work & Family Studies	GRADS Class Structure	090194
Medium	Work & Family Studies	Impact	090195
Medium	Work & Family Studies	Resource Management	090108

Cost Category	Cluster	Course Title	EMIS Course Code
Low	Integrated Academic	Algebra	110301
Low	Integrated Academic	Applied Communications	050545
Low	Integrated Academic	Applied Mathematics	110500
Low	Integrated Academic	Business English	030600
Low	Integrated Academic	General Mathematics	111100
Low	Integrated Academic	General Science	130100
Low	Integrated Academic	Geometry	111200
Low	Integrated Academic	Grammar and Usage	050220
Low	Integrated Academic	Integrated Language Arts/English	050001
Low	Integrated Academic	Integrated Mathematics	110800
Low	Integrated Academic	Literature	050300
Low	Integrated Academic	Physiology	132420
Low	Integrated Academic	Pre-Calculus	110610
Low	Integrated Academic	Reading	059902
Low	Integrated Academic	Science	132515
Low	Integrated Academic	Speech	050500
Low	Integrated Academic	Trigonometry	111600
Low	Business	Employability Skills	990362
Low	Business	Entrepreneurship	990361
Low	Career-Based Intervention	Occupational Work Adjustment (OWA)	049998
Low	Work & Family Studies	Family Relations	090106
Low	Work & Family Studies	Life Planning	090111

Cost Category	Cluster	Course Title	EMIS Course Code
Low	Work & Family Studies	Middle School Work and Family Life	090185
Low	Work & Family Studies	Nutrition and Wellness	090107
Low	Work & Family Studies	Parenting	090102
Low	Work & Family Studies	Personal Development	090101

Appendix G
State Approaches to Funding Vocational Education
Fiscal Year 2001

Funding Approach	Description	States Employing Approach*
Unit Funding Student participation units	Funding based on each district's proportional share of total statewide vocational enrollment according to the following general formula: *Total state funding for vocational education funding* **x** *district's proportional share of total statewide vocational enrollment*	Arizona, California, Connecticut, Massachusetts, Maryland, Minnesota, Montana, New York, North Carolina, Hawaii, Rhode Island, Utah, Vermont, Washington, West Virginia
Instructional units	Funding based on the number of instructional units (e.g., vocational classes) within a given district with each district receiving a set dollar amount per unit.	Alabama, Delaware, Kentucky, Mississippi, Tennessee, Virginia
Cost reimbursement	Districts submit reports to the state detailing the dollars spent on vocational education. State reimburses districts for all or a portion of these costs.	Colorado, Idaho, Iowa, Maine, Michigan, North Dakota, Oklahoma, and Pennsylvania
Foundation grants	No supplemental funding provided for vocational education. Rather, a district's vocational education program is funded from the state's foundation payment or through local or federal funds.	Arkansas, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, Oregon, South Dakota, Wisconsin, Wyoming
Weighted funding	Supplemental funding provided for vocational education through weights multiplied by a foundation amount.	Alaska, Georgia, Illinois, Indiana*, Kansas, Louisiana, Ohio, South Carolina, Texas
Performance-based funding	Portion of vocational education funding tied to student performance or outcomes such as successful completion of vocational training programs, employment, or attainment of industry certification.	Florida Missouri

*Indiana will adopt a performance-based funding system beginning with the 2002-2003 school year.

Comments

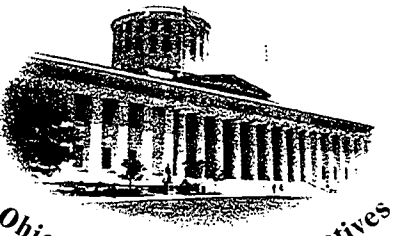
Committee Members Comments

- **Representative Merle Grace Kearns, Chair, Legislative Committee on Education Oversight**
- **Representative Kevin DeWine**
- **Senator Robert Gardner**

Agency Comments

- **Ohio Department of Education**

LOEO Response



Ohio House of Representatives

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Ohio Children's Trust Fund Board, Chair
Legislative Office of Education Oversight, Chair

Evaluation of Career-Technical Education Funding in Ohio
February 6, 2002

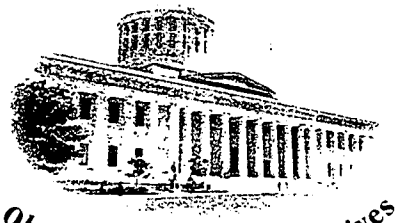
I appreciate the opportunity to append comments to this LOEO Report.

Having served on LOEO as both a senator and now as a house member, as well as chair of LOEO this 124th General Assembly, I am well aware of the rigorous standards of research and documentation which the staff uses to pursue answers to questions/assignments posed to the body.

In that regard, I would first commend and complement the study team for their diligence and persistence in untangling some of the statistics, and their concern with the lack of reliability of one year of numbers, which led the team to extend the study by a subsequent year to have better data to use.

I am also cognizant of the efforts of the Ohio Department of Education (ODE) to improve and strengthen its Education Management Information System (EMIS). The job is yet to be completed; consequently, the adverse impact of the reliability of an earlier ODE study about weighted funding is so noted.

The 122nd General Assembly requested this study in Am. Sub House Bill 650 (February, 1998). Consequently, my message to the General Assembly regarding the two LOEO recommendations would be one of support for the establishment of a working group to determine quality measures and to increase and improve career-technical education data, with the exception that such a group be headed by an independent but respected office or division of budget and management, such as Office of Budget Management (OBM) or the fiscal staff of the Legislative Service Commission not by the Department of Education. ODE should be an integral part of said working group, but removed from the leadership responsibility so as to enhance the independent nature of the study and report.



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Industrial Technology & Enterprise Advisory Council
SchoolNet Technology Advisory Council
Central State University Financial Review

MEMORANDUM

TO: Nancy Zajano, Director
Legislative Office of Education Oversight

FROM: Rep. Kevin DeWine

DATE: February 6, 2002

RE: Comments on Career-Technical Education Funding Report

I appreciate the opportunity to comment on the Career-Technical Education Funding report. I would also like to express my appreciation for the time and effort put into this project by you and your staff. The following items were brought to my attention concerning the report.

- **Cost analysis**: For their review of the Ohio Department of Education's cost analysis, LOEO visited and interviewed 5 JVSDs, one compact, and one single district school. Given the total number of single districts and compact arrangements for career technical education in the state, information from just one single and one compact cannot accurately reflect costs associated with those schools statewide. In order to get an accurate picture of the cost associated with the delivery of career technical education, a more representative sample should have been used by ODE. Noting questions raised about the accuracy of the weighted funding study, I would recommend a more comprehensive analysis of career-technical education expenditures.

- **Equipment expense:** Line Item 545 of the state budget has an earmarking for career technical equipment, but it does not cover those costs entirely in a single district and compact arrangement. The fact that the study subtracted the cost of equipment in determining per pupil cost is curious. What led to the determination of equipment as capital good and funded through a different line item? (LOEO report pages 18 and 25)

- **FTE definition**: Please address how LOEO defined a full-time equivalent (FTE) student. Students enrolled in career technical classes at a single, comprehensive district or compact could be taking college prep classes as well as career tech. How are they classified then - 1/2 time, 1/4 time, FTE in two programs on EMIS? Does the study take this into account in determining the total number of FTEs?

- **Cost classification:** By what criteria were programs judged as to cost classification, i.e. "low cost", "medium cost", and "high cost"? Evaluation by one individual is only indicative of that person's experience and thereby, a subjective rating. Perhaps a more objective method could be utilized.

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Comments of Senator Robert A. Gardner to LOEO Report: "Evaluation of Career-Technical Education Funding in Ohio"

As a career educator who spent more than 23 years teaching in one of Ohio's joint vocational schools, I am confused by the findings contained in this report. According to the researchers, there is "little evidence to support Ohio's current configuration of supplemental funding weights for career-technical education." My confusion stems from the fact that as an educator in a vocational school, I saw exactly how each program impacted on the district's budget and I know that there are additional costs associated with career-technical education.

My confusion is compounded because at the same time, I highly respect the work of the researchers within the Legislative Office of Education Oversight and I know that they go to great lengths to be objective and to find and analyze all evidence before issuing their reports. Several years ago, when LOEO was presenting another report, one of my colleagues stated that "no matter how much we torture the data, it cannot tell us what it does not know." I believe that this quote is very appropriate in describing the findings in this report. LOEO was given a very narrow scope to look at this issue. By limiting the data that could be used in their research, we also limited the conclusions that could be drawn. Let me offer several observations with regard to this issue.

First, this study did not address vocational equipment costs because they are funded through a separate line in Ohio's biennial budget rather than with the weight in the basic aid line. However, when we look at the amount of money provided for equipment, it averages only $200 per vocational program offered. Equipment costs often exceed what is given to districts through the equipment line item. Thus, most schools are forced to spend part of their weight to meet their equipment needs. Because this study only addressed the basic aid line, LOEO did not consider this additional cost when looking at whether a career-technical program costs more to operate.

The report also concluded that "career-technical education teacher salaries are not substantially higher than those for regular education." Specifically, The average career-technical teacher is paid $40,927 versus $38,811 for all K-12 classroom teachers --- a $2,116 difference. I agree that the cost per teacher is small. However, there are 6,466 educators in Ohio teaching in some type of career-technical program. If we calculate this salary difference for all of the teachers, we discover that it costs $13.7 million additional to hire these people.

The LOEO report also looked at average class size and found that a regular classroom averages 19.5 students while an average career-technical class has 14.5 students. We already have a method of calculating a weight for reduced class size using the number of students that would be in those classes. There are 76,350 career-technical education students enrolled in Ohio's programs and when we look at the difference in cost to have those students in classes with an average of 14.5 students, versus having them in classes that average 19.5 students, we find that it costs about $53 million MORE to run the smaller classes given a 50% state share of funding.

It is clear from the conclusions that LOEO's researchers recognized the data's shortcomings. The report suggests that additional data are needed to better understand the issue of career-technical funding and the researchers suggest that a more comprehensive study be done using wider parameters. They also suggest that the Department of Education needs to collect additional data to better address this issue.

I strongly agree with these last statements and have already met with the Department of Education to discuss a more comprehensive examination of this issue using a much broader scope of data. I have also asked them to determine what data are needed to fully examine all aspects of the subject and to make arrangements to begin collecting it. In the coming weeks and months, I plan to work with those involved in career-technical education to see that this additional study is brought to fruition.

It is imperative that we work to develop a clear understanding of the costs associated with career-technical education. I look forward to continuing the dialogue regarding the weights and the rest of the funding issues associated with this program.

Ohio Department of Education

Susan Tave Zelman

Superintendent of Public Instruction

To: Nancy C. Zajano, Director
Legislative Office of Education Oversight
From: Susan Tave Zelman, Superintendent of Public Instruction
Date: February 6, 2002
Re: Comments for LOEO Report -
Evaluation of Career-Technical Education Funding in Ohio

The Legislative Office of Education Oversight's (LOEO) report, *Evaluation of Career-Technical Education Funding in Ohio*, has implications for Ohio's system of funding career-technical education. Even though the current weighted funding methodology was critiqued and no new information or better methodology was provided, the LOEO report did validate the need for career-technical education weights.

The evaluation's deficiencies included the use of FY96 financial data and FY00 enrollment data. More current data was available and significant changes have occurred but were not represented in the report. To address quality and assure integrity of financial and enrollment information, the Ohio Department of Education (ODE) has implemented information management system checks, communicated career-technical performance expectations, and relied on the Auditor of State to assist with assuring documentation of career-technical expenditures at the district level.

LOEO's presentation on January 23 unfairly portrayed ODE as an agency with questionable competence in the areas of research design, fiscal management, and data collection and analysis. LOEO was aware of a one-month window in 1999 that allowed districts to update three years of EMIS data. Some reporting errors occurred. ODE corrected the problem and funds were never in jeopardy. During the presentation, LOEO's answers to legislators' questions portrayed ODE as incompetent and school districts as misusing career-technical resources.

ODE was viewed as unresponsive to researchers' requests. That is an unfortunate and false portrayal of the agency that advocated for the study and embraced the General Assembly's intent. It was in the best interest of the system for the LOEO study to yield recommendations. Every effort was made to assist. It should be noted that the General Assembly required LOEO to issue a report by December 31, 2000.

In checking our records, it is apparent that LOEO researchers had considerable time lags between contacts. In some cases, it was over six months between contacts by LOEO. Throughout the LOEO research process, and up to the final hours before the report was prepared for printing, ODE provided data and information to the LOEO.

When weighing the value of the LOEO study or when the General Assembly considers any action based on the LOEO report recommendations, ODE strongly advocates examination of the study's methodology. The original study conducted by ODE was modeled on the Augenblick approach used to calculate Ohio's base cost amount for regular education. The General Assembly was committed to creating one system for funding Ohio's education system. All components were intended to fit together and be undergirded by the funding system's principles. The methodology employed by ODE when determining the weights did support the General Assembly's intent.

Since the base cost reflects kindergarten through 12th grade costs, all comparisons of career-technical factors or costs should be made to kindergarten through 12th grade, not just high school. In Ohio's school foundation formula, additional weights for career-technical pupils are applied to the adequate base cost amount that is based on kindergarten through 12th grade base expenditures. Therefore, relevant cost comparisons in developing weights should be made between career-technical costs and kindergarten through 12th grade costs. The comparisons of average teacher's salary and of class size made by LOEO are inappropriate because they compared career-technical teacher's salary and class size to teacher's salary and class size for high schools only. This would be appropriate if the adequate base cost used in our foundation formula was based on high school expenditures only.

The lower class size and higher average teacher's salary cited in the study account for $67 million of the $75.5 million in career-technical additional weighted funding in FY00. LOEO states that career-technical average class size is 14.5 compared to 19.5 for regular education and that the average teacher's salary for career-technical was $40,927 compared to $38,801 for kindergarten through 12th grade regular teachers. From this information, LOEO concluded that career-technical education does not cost more than regular education and that the current weights produce unnecessary state aid for career-technical education. ODE does not agree with LOEO's conclusions. Since teachers' salaries have more influence on costs than any other factor, a common way to estimate the relative cost of education of any set of pupils is to simply compare the average class size of the set of pupils to that for general education pupils. For example, if the average class size for regular education is 24 pupils and the average class size for career-technical pupils is 12 then the total weight for career-technical would be 24/12=2 and the additional weight would be 2-1=1. It would require twice as many career-technical teachers as regular teachers to instruct the same total number of pupils.

Using the class size data in the LOEO report, the regular instruction class size of 19.5 divided by the career-technical class size of 14.5 yields 1.344. Therefore, the implied additional weight would be .344 for career-technical pupils. If the weight is applied to the 76,350 career-technical pupils shown in Exhibit 2 of the LOEO report, we get additional weighted pupils of 76,350 x .344 = 26,264. If we assume an overall average state share percentage of .50, the FY00 additional weighted aid based solely on class size would be 26,264 x $4,052 x .5 = $53,210,864.

Comparing the average career-technical teacher's salary of $40,927 to the kindergarten through 12th grade regular teacher's average of $38,801 yields that on average each career-technical teacher costs $2,116 more. School districts have reported 6,466 teachers with a 207 code (career-technical teachers) for FY01. If each of these teachers costs $2,116 more than regular teachers, then the additional costs of career-technical education due to higher teacher salaries is $2,116 x 6,466 = $13,682,056. Taking into account the costs of lower class size and higher salaries indicated in the LOEO report, the estimated additional cost of career-technical education would be $53,210,864 + $13,682,056 = $66,892,920.

Using newer salary data, the higher salaries for career-technical teachers and the lower class size account for the entire cost of the weighted funding. According to data reported for FY01, the average salary for teachers coded as 207 (career-technical teachers) was $46,000 and that for 205s (regular classroom teachers) was $39,353. This difference of $4,647 per teacher times the 6,466 career-technical teachers is $42,979,502. Add this figure to the $53,210,864 and an additional cost of $96,190,366 is obtained.

In FY00 the weights of .3 and .6 generated $41,179,121 for joint vocational school districts and $34,326,697 for regular districts for a total of $75,505,818. In light of these calculations, the LOEO report conclusions are questionable. Almost the entire amount paid for the additional weights is accounted for by the class size and salary differences for career-technical education reported in the LOEO study.

Comparisons among various states' base cost amounts and weights are not meaningful without knowing what is included in them and how they are used in their state aid formulas. In Exhibit 12, the amount of state and local revenue per pupil guaranteed in Ohio's foundation formula for career-technical pupils is compared to base costs plus weighted aid for the other eight states that have weighted aid. Without knowing what is included in the base cost figures of these states, how these base cost figures and the weights are used in the respective states' aid formulas, and how the local share is determined in these formulas, it is impossible to draw conclusions from this comparison. For example, in the Texas formula, basic aid is divided into two parts - a foundation approach with a charge off like Ohio's formula and a second tier based on a guaranteed tax yield formula. This makes our base cost figures not comparable. Also, to put the cost figures in a proper context, the LOEO report did not provide any information on the level and quality of other states' programs.

We are concerned that the design and delivery of a multi-dimensional career-technical education system may have resulted in some misunderstandings about FTEs, enrollment, programs, courses and units. Also, ODE acknowledges that Ohio has a very complicated funding, accounting and information system. To capture costs of specific programs, significant changes would be required to support a new system.

LOEO's legislative charge was to (1) evaluate state and local funding for career-technical education, (2) conduct an analysis of districts' career-technical education costs, and (3) recommend a new mechanism for funding career-technical education through a weighted-pupil mechanism or other type of funding mechanism. ODE was disappointed that the third component of the charge was not addressed.

However, ODE is encouraged that LOEO acknowledged the need for career-technical program weights. We look forward to working with career-technical education leaders and district administrators to assure that a defensible, valid system of weighted career-technical education serves Ohio's students.

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LOEO RESPONSE

It is the practice of the Legislative Committee on Education Oversight to include comments of agencies affected by Legislative Office of Education Oversight (LOEO) studies in the final report. LOEO staff may add responses to agency comments to clarify specific issues. The following points are made in response to the comments from the Ohio Department of Education (ODE).

LOEO appreciates the comments of the Ohio Department of Education staff. While we do not agree with all of the statements, we recognize that ODE staff care deeply about their work and about the provision of career-technical education to Ohio students.

LOEO regrets that during the presentation of this study to the Legislative Committee on Education Oversight, ODE staff felt that LOEO was portraying the Department in a negative light. LOEO's presentation included 18 slides, only one of which critiqued ODE's method of determining weighted funding. Committee members then asked questions regarding ODE to which LOEO responded truthfully and without any negative intent.

It is also unfortunate that ODE is now raising concerns about the methodology and findings of the LOEO report. LOEO shared its methodology plan early in the process of the study with ODE staff. We also provided a draft of the report for ODE's review and initiated a meeting after receiving ODE's feedback to be certain that we had heard all of their concerns. Nevertheless, LOEO remains willing to discuss any methods and findings with ODE staff.

ODE raises questions about the data from various fiscal years used in the LOEO report. To clarify, when describing career-technical education and its current funding (Chapters II and III), LOEO used the most recent data available. In most cases, the descriptive data came from fiscal year 2000, although occasionally fiscal year 1999 was the most recent available.

On the other hand, the purpose of the fiscal analysis (Chapter V) was to determine whether supplemental funding for career-technical education was warranted. To do so, LOEO needed to use spending data from *before* weighted funding was implemented. It would be inappropriate to use current spending, which reflects supplemental weights, as a way to justify the supplemental weights.

Furthermore, in 1997 Dr. John Augenblick, using regression analyses completed for ODE, reported to the General Assembly that Ohio school districts were not spending more for vocational education programs than they were for regular education programs. Similar to many readers in Ohio, LOEO was puzzled by these findings. As a part of this study, LOEO tried to replicate and refine that original regression analysis in order to see if we could refute its conclusion. To do so, we had to replicate the original FY 1996 data set.

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ODE also raises questions about LOEO's comparison of Ohio's funding for career-technical education with that used in other states. LOEO's description of other states' approaches provides the first comprehensive national look at how individual states fund this program. LOEO's comparison focused exclusively on the *approaches* used for funding and the footnote to Exhibit 12 describes what is excluded from the base cost figures in those states using a weighted funding approach.

ODE asks why LOEO did not complete all three aspects of its legislative charge, namely to recommend a new mechanism for funding career-technical education. LOEO attempted, through various methods, to assess the costs of career-technical education, which would then have led to a recommendation for a funding mechanism. One of LOEO's approaches was to isolate the career-technical education costs from the actual year-end expenditure data reported by school districts providing these courses. However, the expenditure data currently reported by districts is not detailed enough to reveal the spending allocated to only career-technical education.

In its regression analysis approach, LOEO found that the proportion of students in career-technical education was unrelated to *overall* district spending. Furthermore, district spending was not impacted by the proportion of students in each of the three program areas that made up the weighted funding system (namely, a weight of 0.6 for the Workforce Development program area and a weight of 0.3 for the Work & Family Studies and Career-Based Intervention program areas). However, the regression analysis did find that the proportion of students in *some courses* did cause districts to spend more. As a result, we know that some supplemental funding is needed, however, the regression analysis cannot tell us exactly how much.

In terms of the class size analysis provided by ODE in its comments, LOEO stated in its report that career-technical education classes are smaller, by an average of five students, than regular education classes in grades 7-12. This situation could result in increased costs to school districts. This is not inconsistent with LOEO's regression analysis, which found that *some,* but not all, career-technical education courses caused districts to spend more. Yet these findings do not reveal how much supplemental funding should be provided. For that reason, LOEO did not recommend a change in funding for career-technical education.

Instead, we recommended a one time data collection effort to determine the costs of career-technical education *by course.* With the new data, it will be possible to see which career-technical education courses cost more to provide and what the state funding level should be for those courses. The result may be that some courses should be funded at a higher level than the current weights provide. When the new data are analyzed, it may be that the overall state funding for career-technical education will remain at the same level, decrease, or increase. In any case, the state funding will be based on evidence that is not currently available to support the existing configuration of funding weights.

LOEO recognizes that ODE is currently improving its collection of career-technical education data. LOEO applauds these efforts, especially the development of new performance measures for career-technical education programs.

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