

STRATEGIES FOR THE DEVELOPMENT OF INTEGRATED CAREER AND TECHNICAL  
EDUCATION PROGRAM EVALUATION SYSTEMS

by

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ABSTRACT

This research effort was designed to analyze the current federal career and technical education legislation to determine methods of “operationalizing” the policy at the state and local levels. In performing the policy analysis, organizational and systems viewpoints were consistently used in determining the intent of the legislation and then how to structure a program evaluation system to fulfill the policy goals. The research methodology is a hybrid interdisciplinary method that combined policy and system analyses. Secondary career and technical education legislation served as a test case to develop the program evaluation system strategies and requirements because the researcher was familiar with this segment of education and the policies associated with it. Program evaluation theoretical foundations were presented as means to understand the policy intentions and to develop a conceptual system model. The resulting system model was presented with actual examples of system constructs. Detailed

process flowcharts were developed to show the system structure and functions. Organizational responsibilities and requirements were addressed in the system model development. An additional component of the systems analysis was to determine the system implementation sequence. The implementation sequence is based on a longitudinal program evaluation design that spans a five-year interval for each graduation year cohort. The system model resulting from this research is one of many possible variations that could be developed to satisfy the requirements of the federal Carl D. Perkins Vocational and Applied Technology Education Act of 1998. The system analysis and model development strategies can be applied to other education and socioeconomic policies that deliver human services with accountability requirements. No attempt was made to perform a system cost analysis in this research effort.

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We endured a number of trails and tribulations that come with pursuing funded research projects at institutions of higher education. A number of wonderful people came and went because they were pursuing careers in education, and the Center allowed them to expand their horizons. Other individuals stayed for the long haul and enhanced their capabilities as the Center diversified. Personally, I learned a lot from and about you, but most importantly it was fun and I enjoyed coming to work everyday.

Most important is my family who allowed me to "shoot at the stars" as my career in industry and then to change careers so I could teach others to reach for the stars. It is now your turn to pursue whatever path you want to take in life.

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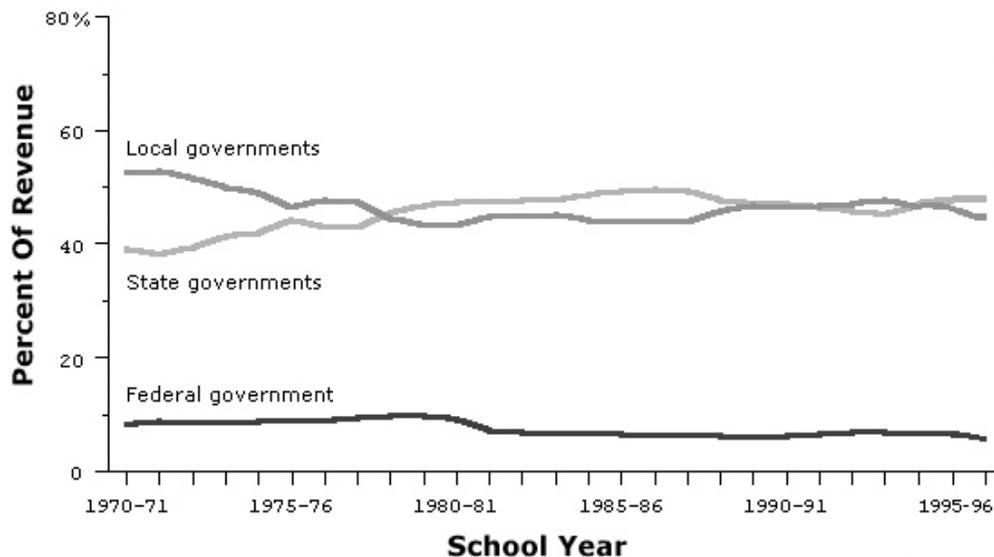
## CHAPTER I

### INTRODUCTION

The nation presently is under the administration of President George W. Bush. He said during the 2000 election campaign that education would be one of the administration's top priorities. This is admirable to place education on the top of the federal government's agenda. Accountability is the rallying cry for politicians when it comes to the basis for improving education in the United States. The question is whether the federal government is the cornerstone of education in this country.

If the federal government is going to become the standard bearer for education in this country, then what will be the roles of the state and local governments? The roles of government in education were discussed by Wirt and Kirst (1997). Will state and local governments become implementers of policy determined by the federal government or will they have an active role in determining what is appropriate and necessary for their states and local school districts? Presently, the federal government provides only a fraction of the operating funds for schools (United States Department of Education, 2001). Most of the money and control of the school is under the purview of state education agencies (SEAs) and local education agencies (LEAs) (See Figure 1)

From a historical perspective, a strong federal role in education is not a new concept. Vocational education was created in this country based on a national socioeconomic need with the federal government having the preeminent role in determining the structure, curriculum, and evaluation criteria that would constitute a vocational education program. In 1917, when



*Figure 1.* Sources of revenue for public elementary and secondary schools: 1970-1971 to 1996-1997. (U.S. Department of Education - National Center for Education Statistics, 2001).

vocational education made its way from political debate to enacted legislation, the role of the federal government in education was changed. No more would the local school board have total authority and responsibility for managing the schools within its district. The federal government would provide the funding, totally or proportionally, for teachers, equipment, materials, and facilities to prepare young adults for careers in industry, the farm, and home (Barlow, 1967; Bennett, 1937; Wirth, 1972, 1980).

If local school systems chose to accept federal vocational education funding, it came with some stipulations. First, the vocational education curriculum would have to conform to standards

specified by the Federal Board for Vocational Education headed by Dr. Charles Prosser. The Board, in consultation with industry and labor, had determined what minimum facilities, materials, equipment, and instructor credentials were required to provide vocational education in a secondary school setting. Second, and most pertinent to this research effort, mechanisms of accountability were established to determine if the programs were doing what they were supposed to do. This meant preparing people to assume entry-level jobs in the workforce or to be effective homemakers upon graduating from high school.

### Need for the Study

The domestic and international marketplaces are changing, requiring people to have different skills and attitudes about work (National Commission on Excellence in Education, 1983). The economy is also developing technology to improve productivity in every sector. With these improvements comes technical obsolescence of some segments within the workforce. This requires that people return to the education system to update their skills, retrain for alternative employment in their field, or change careers completely. Acknowledgement by the government and education system results in the development of education and training programs in response to socioeconomic change (Inglehart, 1997; Reich, 1992).

To enter into the discourse about the present state of career and technical education, it is appropriate to look back at the influences that shaped vocational and technical education in the United States. In 1917, manufacturing and farming were the economic sectors that employed most of the population in the United States. Both sectors produced tangible products and sold them in markets that were restricted by transportation, currency exchange, import/export

policies, and international treaties. Today, both of these sectors are declining, being replaced by a large service sector requiring people with a range of work skills that are broader based, more abstract, and subject to rapid change as technology is introduced or enhanced in the workplace (Toffler & Toffler, 1995).

To address these economically induced changes in the American workplace, the federal government, over the course of three decades, has enacted legislation that slowly transformed academic, vocational, and adult education. Academic education and vocational education are being melded to form career and technical education (Grubb, Davis, Lum, Plihal & Morgaine, 1991).

Career and technical education (CTE) is more than merely a change at the K-12 vocational programs level. It is a fundamental shift in education strategy that has an overarching goal of preparing people for work and the life-long pursuit of additional education or training as the workplace changes. Drucker (1994) called this phenomenon a shift from the “blue collar worker” to the “knowledge worker.” This component alone differentiates CTE from its predecessor, vocational education. Grubb (1996) called this shift in approach “new vocationalism.”

Vocational education came to be because of socioeconomic change. An era of invention and industrialization, organized labor, two world wars, and a resulting mass production, consumption-based economy made vocational education the workforce preparation structure that served the national interests well for nearly a century. CTE will replace vocational education by merging academic (abstract) and skill-developing (experiential) learning to form an education system that prepares a workforce to participate in a socioeconomic system that accommodates change. Most importantly, it will teach students how to learn.

The need for this study focuses on the Perkins III legislation and how it can open new avenues for determining whether education, and in particular secondary CTE, has served the society and individual participants well. To promote informed change, a process that measures participants' satisfaction and performance accurately is required of program evaluation systems. Usage of the program evaluation information makes institutions accountable for programs designed to serve the needs of society.

### Purpose of the Study

The purpose of this research effort was to identify program evaluation system strategies for policy-based programs providing human services. Based on these strategies, a policy test case was selected having specific requirements for program accountability. The Carl D. Perkins Vocational and Applied Technology Education Act of 1998 (Perkins Act) was chosen as the policy test case. Then using the system strategies and the policy test case, a conceptual program evaluation system model was developed. Program evaluation system strategies are the products of this research effort and can be applied to other policies that use comprehensive program evaluation as a means of satisfying accountability requirements. A by-product of this research is a program evaluation system that satisfies the requirements of the Perkins Act.

### Assumption

Federal, state, and local agencies have organizational components that are functionally equivalent from institution to institution. The assumption is that organizational functions, such as information system management, employment data, and secondary education program

administration, translate from agency to agency. Organizational structures among agencies are similar to accommodate peer-to-peer lines of communication.

### Delimitation

Many state boards of education and some local education agencies have requirements that exceed the requirements of the federal legislation. No effort was made to include all state and local program evaluation requirements in the development of the conceptual system model. When appropriate, additional functions of the system model were presented to express the possible uses of the data to satisfy state, local, and research interests beyond the scope of the federal legislation. The conceptual model development emphasis was placed upon satisfying the accountability requirements first and foremost as specified in the federal legislation.

### Statement of the Problem

Program accountability is a primary policy objective in much of the federal legislation being enacted. Evaluation systems that provide valid and reliable measurement of program performance must be strategically developed to satisfy policy accountability objectives.

### Research Questions

1. What program evaluation strategies are pertinent to a system designed to meet the accountability requirements of policy-based human services programs?
2. What does the career and technical legislation require regarding program accountability?

3. How, and in what sequence, should the proposed program evaluation system be implemented?

### Description of Research Procedures

System analysis is an interdisciplinary combination of qualitative and quantitative research methods (Best & Kahn, 1993; Patton, 1990). This study is more qualitative in its approach to analyzing the problem and developing the conceptual system.

Initially in the research effort, the researcher identified the system model input parameters and output parameters. The system model parameters were characteristics that the researcher believed to have value in the design of a program evaluation system. Parameter selection was experience and background derived from work done for the Center for Assessment, Evaluation, and Educational Programming at Virginia Polytechnic Institute and State University, the Virginia Department of Education, and as a systems engineer in the aerospace industry (see Vita). The parameters were very general and could be applied to many policy-driven program evaluation system design processes. These parameters established the frame of reference for conducting the research.

Three additional research procedures followed the system model parameter identification. Each research procedure progressively added resolution to the general system development strategies and the specific Perkins Act program evaluation system requirements. The first procedure was a review of germane program evaluation theories and the practices used in determining program performance. From this activity, general program evaluation system strategies were developed. A detailed review of authoritative analyses of the Perkins Act was the

second research procedure accomplished. This procedure specifically identified the policy accountability requirements as they pertained to the development of a program evaluation system.

The third research procedure is the culmination of the previous research procedures. It synthesized the general system strategies and policy specific accountability requirements by developing a conceptual system model to evaluate the performance of the Perkins Act. Many of the system strategies developed have broader application than just meeting the requirements of the Perkins Act. The result from this research procedure was the system analysis methodology and conceptual model development of a program evaluation system.

The research procedures presented above are a progressive identification and application of concepts that influence the design of program evaluation systems. These concepts represent both policy specific and general system strategies. Each subsequent research procedure elaborates on the products of the previous research procedure. To represent this progressive building of system design strategies, a research taxonomy is presented in Table 1. Level 1 in the research taxonomy is the identification of the most general system design influences. Level 4 yields a targeted conceptual program evaluation system to meet or exceed the requirements of Perkins Act. From this research process, the system analysis and strategies are the primary outcomes with a Perkins Act program evaluation system used as the “test case.”

### System Model Input and Output Parameters

As stated in the Introduction, the goal was to “operationalize” the accountability section of Perkins Act by producing a conceptual system model. Constraining the system analysis to keep it

Table 1

*Research Procedures Taxonomy*

Taxonomy Level	Taxonomy Level Product	Description	Source
Level 1 (Chapter I)	System Model Input/Output Parameters	General problem identification features for the development of policy driven program evaluation systems	Researcher
Level 2 (Chapter II)	Theoretical Frameworks	Review of pertinent program evaluation literature and research to develop system model strategies	Program evaluation researchers, practitioners and theorist
Level 3 (Chapter III)	Policy Review and Analysis	Identification of Perkins Act specific requirements and constraints	Federal Government and authoritative organizations
Level 4 (Chapter IV)	System Analysis and Model Development	Development of a program evaluation system model having both generalized strategies and Perkins Act specific attributes consisting of: <ul style="list-style-type: none"> <li>• system configuration</li> <li>• system functions</li> <li>• implementation sequence</li> </ul>	Researcher synthesis of taxonomy levels 1 through 3

manageable but capable of accomplishing the operate task, four input parameters were used (see Table 2). The input parameters are legislation, organization, technology, and information sources. A degree of conjecture was introduced using these four input parameters because of their breadth of scope. The researcher acknowledges this and concedes that the conceptual system model produced is one of many possible variations that could be produced to accomplish

this program evaluation. As the system analysis was developed, the scope of each of the input parameters was refined and elaborated upon to accomplish the creation of the conceptual system model. It is impossible to make these parameters completely independent of one another.

Table 2

*Input Parameters*

Parameter	Description	Source
Legislation	Accountability and privacy requirements	Federal Government
Organization	State Education Agency's coordinating role	State Government
Technology	Database and data communications	Industry
Information Sources	Available extant data	Public & private sectors

The output parameters (see Table 3) are defined as requirements and constraints (system), conceptual system (configuration), implementation sequence, and philosophy (legislative intentions). The output parameters are products of this study. Requirements were derived from the enacted CTE policy. Constraints are influences that impede the program evaluation from performing specific functions. The conceptual model is a strategically planned system to perform a program evaluation. The conceptual model defines what the system would look like and how it works to perform the tasks as specified by the requirements and influenced by the constraints.

Implementation sequence places the program evaluation tasks on a timeline. Philosophy is the legislative intentions and underlying culture that will make the system work. The utility of

the system model is to provide policymakers with feedback and function as a program management tool based on these four output parameters. The conceptual system model is presented in Chapter IV.

Table 3

*Output Parameters*

Parameter	Description
Requirements/Constraints	Identification of system characteristics
Conceptual System	Functional system configuration (architecture)
Implementation Sequence	Time and activity based plan
Philosophy	Policy program evaluation intentions (culture)

## Definition of Terms

The terms defined below were used throughout this research.

Career and Technical Education (CTE) – a branch of the U.S. education system that focuses on preparation of individuals for occupations in the workforce. Merges academic and career development education and training. CTE replaced the vocational education model to address the changing national socioeconomic needs. (see Chapter IV)

Conceptual System Model or System Model – a comprehensive program evaluation system representation showing the functions and operations based on system strategies, policy

requirements and constraints, organization, costs (not addressed in this research), technology, and/or time.

Graduation Year Cohort - individuals who did or should have graduated from high school in a specified school year. These individuals may or may not be high school graduates.

Local Education Agency (LEA) – summary term used inclusively indicating local school system administration, faculty, and staff responsible for the execution of local, state, and federal education policies.

Monolithic Database Structure – data are collected and stored based on a unique characteristic of one item in a record. The single characteristic in this research is the individual vocational program completer or participant, and all record contents are attributable to the individual and/or groups of individuals.

Perkins III or the Perkins Act – The Carl D. Perkins Vocational and Applied Technology Education Act (20 U.S.C. 2301 et seq.) (1998a).

Primary Database – a sub-system in a relational database structure that holds the records of unique individual characteristics but not the characteristics that apply to all or some records in the database.

Program Completer – an individual who has completed a specified career and technical education course sequence and passed a summative evaluation for both knowledge and skills attainment. Program completers may also receive certification or licensure as result of completing a career and technical education program. Program completers may or may not be high school graduates.

Program Participant – an individual who has taken career and technical education courses but not completed a specified program sequence. These individuals may or may not be high school graduates. Perkins III vocational program concentrators are included in this group.

Relational Database Structure – Uses multiple databases to collect and store data pertaining to multiple system operations. Data are merged for analysis and reporting from primary and secondary databases that compose this system structure.

Requirements – are specified by the Perkins Act and must be incorporated into the design of the conceptual system model.

State Education Agency (SEA) – summary term used inclusively indicating the state executive organization responsible for the administration of education policy.

Strategies – are concepts that influence the design of a policy-driven program evaluation system; they can be generalized to serve the purposes of many evaluation types.

Student and Graduate Follow-up – part of the program evaluation process that surveys individuals who participated in or completed secondary career and technical education programs.

Support Database – a sub-system in a relational database structure (see above) that holds the records of unique characteristics used by the primary databases to build or augment records for operations, analysis, and reporting purposes.

Systems Analysis – a methodology identifying the requirements and constraints that determine the configuration and operation of a system.

Systems Architecture – the configuration of the conceptual system model consisting of primary and secondary databases.

Technology – used as an inclusive term for describing tools, both physical and knowledge.

Vocational and Technical Education (VTE) – a branch of the education system in the United

States that provided workforce education and training for skilled and semi-skilled occupations.

Workforce Investment Act (WIA) - Public Law 105-220 that specifies the Department of Labor policy relationships with the Carl D. Perkins Vocational and Applied Technology Education Act.

## CHAPTER II

### PROGRAM EVALUATION THEORIES AND STRATEGIES

#### Introduction

Program evaluation theories and frameworks provided a context that helped in designing the conceptual system model. Books and journal articles abound with thought-provoking and highly articulate program evaluation theories covering the gamut from the pragmatic to the esoteric.

Phillips (1997) stated:

With so many frameworks for evaluation, the question becomes, “Which one is best?” There is no right answer. What is best for one organization may be inappropriate for another. The most important course of action is to select a model that the organization will focus its evaluation. (p. 44)

Table 7 is referred to throughout this chapter and was created to provide a synopsis of the system development strategies identified in discussion of program evaluation theories and practices as they relate to the purpose of this research. It is located on the last page of this chapter.

#### Program Evaluation Theories

Theorists identify epistemological differences about why and how to conduct program evaluations. House (1980, 1983a, 1983b) described evaluation approaches as objectivism and subjectivism. These two categories distinctly place the evaluator in different roles. Objectivism has the evaluator as a neutral player who is “scientifically objective” when conducting an

evaluation. The results of an evaluation process are reliable because another evaluator using the same methodology can reproduce them. The scientific approach requires the evaluation to be constructed as an empirical measurement system. This end of the continuum relies heavily upon methodology and the impartiality of the evaluator in designing and implementing an evaluation process.

On the other end of the spectrum lies subjectivism. This places the evaluator as the informed interpreter of program evaluation data. The subjectivist argues that people participating in the activity being evaluated are the only ones who know how they feel about their experiences. The evaluator must organize the subjects' responses based on the knowledge he/she has about the situation being measured. Reproducing the results of these evaluations is difficult because of dependence on the evaluator's expertise. Validity and in particular reliability come into question when discussing the subjectivist approach to program evaluation.

House (1976) reduced the objectivist/subjectivist epistemologies one level further by looking at the program value with respect to the two philosophies. He called them Utilitarian and Institutionist-Pluralist evaluations. These two evaluation types align closely with their philosophical counterparts. Utilitarian evaluation is the objectivist approach to the program evaluation process. The utilitarian premise according to House (1983a) is "the greatest good is that which will benefit the greatest number of individuals" (p. 49). In this case, the evaluation process will have value based on the measurement of group benefits. Data collection will concentrate on using "hard" data (e.g. test scores, production rate, number of courses taken) as measurements of program performance. The evaluator in this process concentrates on group

gains identified in the data analysis. Worthen, Sanders, and Fitzpatrick (1997) characterized the application of the Utilitarian evaluation as:

The best programs are those that produce the greatest gains on the criterion or criteria selected to determine worth. Statewide assessment programs and large-scale comparative evaluations of welfare systems are utilitarian in nature. Most utilitarian evaluation approaches lend themselves to use by governments or others who mandate and/or sponsor evaluation studies for which managers and public program administrators are the major audience. (p. 66)

Institutionist-Pluralist evaluation places the determination of program value on the individuals who participate in it. The individual participant determining the value of the program is the subjectivist approach to evaluation. Both “hard” and “soft” data are used in this type of evaluation. Soft data collection methods such as interviews and testimonials are preferred over or in combination with measurements of performance criteria. House described the measurement value as: “...the subjective utility of something is based on personal judgment and personal desires. Each person is the best judge of the events for himself” (p. 56). The usage of Institutionist-Pluralist evaluations were identified by Worthen et al. (1997) as:

Within limits of feasibility, most institutionist-pluralist evaluations try to involve as “judges” all individuals and groups who are affected by the program being evaluated rather than leave decisions and judgments to governmental sponsors and high-level administrators – as is typically the case with utilitarian evaluation. (p. 67)

The Perkins Act of 1998 (Perkins III) was enacted to serve the public interests by offering education and training opportunities to program participants from many facets of society. To evaluate the effects of public human services policy takes a more Utilitarian-oriented program evaluation. This does not limit the program evaluation approaches to “objective-oriented” and “management-oriented” as described by Worthen et al. (1997), but these would be more desirable to an organization that was interested in knowing the clients served by the policy benefited in tangible ways and that society derives benefit because of individual achievements. Program evaluation for Perkins III should use utilitarian approaches because it is measuring the participants’ responses to a public policy-mandated program and is the first system design strategy (see Table 7 – Strategy 1).

One of the biggest problems to overcome in the design of a system model to support policy objectives is to isolate the effects program provided education and training that are attributable to the policy. Management-oriented approaches are used by local, state, and federal agencies to evaluate many programs. Their strength lies within their systematic structuring, allowing the evaluation to assist in decision-making during the program with the overarching goal of program improvement. Stufflebeam (1971) and Stufflebeam and Shinkfield (1985) developed a program evaluation framework that provided educational decision-makers with four evaluation types. The four evaluations were Context, Input, Process, and Product (CIPP). The goal of each evaluation type is to assist in making judgments about the program being evaluated to improve its performance, redirect the program, or to remove the program.

A similar evaluation framework was developed by Alkin (1969, 1991) at University of California – Los Angeles. This framework was called the UCLA Evaluation Model and was

extensively used by the Center for the Study of Evaluation at UCLA. Alkin used four assumptions about evaluation in the creation of this framework:

1. Evaluation is the process of gathering information.
2. The information collected in an evaluation will be used mainly to make decisions about alternative courses of action.
3. Evaluation information should be presented to the decision maker in a form that can be used effectively and which is designed to help rather than confuse or mislead him.
4. Different kinds of decisions require different kinds of evaluation procedures. (p. 94)

The Alkin framework has five types of evaluations within it (see Table 4).

Worthen et al. (1997) consider the two evaluation frameworks presented above as “management-oriented” approaches on the Utilitarian/Institutionist-Pluralist program evaluation continuum.

Both allow the evaluation to be used throughout the program life cycle and can provide interim information (feedback) so the program can be adjusted to meet policy requirements. These evaluation approaches are used as program management tools providing continuous information to the agencies that implement and control the delivery of the program.

From the management-oriented frameworks come three additional system development strategies:

1. Isolates the effects of the program
2. Assists in determining program improvement, and
3. Serves as a program management tool.

Table 4

*Alkin's UCLA Evaluation Framework*

Evaluation Type	Description
Systems Assessment	Provide information about the state of a system
Program Planning	Assist in the selection of particular programs likely to be effective in meeting specific educational needs
Program Implementation	Provide information about whether a program was introduced to an appropriate group in the manner intended
Program Improvement	Provide information about how a program is functioning, whether interim objectives are being achieved, and whether unanticipated outcomes are appearing
Program Certification	Provide information about the value of the program and its potential for use elsewhere

“Consumer-oriented” approaches (Worthen et al., 1997) can provide an additional facet to a comprehensive program evaluation. These approaches are primarily used in programs that deliver human services, education, and training programs that include a wide-range of clients. The education, training, and development (ETD) programs evaluated using these approaches are not limited to government-sponsored programs but also have commercial program applications. Scriven (1967) developed criteria for formative and summative evaluations. These criteria were:

1. Evidence of achievement of important educational objectives
2. Evidence of achievement of important non-educational objectives (e.g., social objectives)
3. Follow-up results

4. Secondary and unintended effects, such as effects on the teachers, the teacher's colleagues, other students, the taxpayer, and other incidental positive or negative effects
5. Range of utility (that is, for whom it will be useful)
6. Moral considerations (unjust uses of punishment or controversial content)
7. Costs. (pp. 41-42)

There are recent variations of consumer-oriented approaches that are gaining favor with commercially or in-house developed ETD programs. ETD programs are designed to develop, enhance, or retrain individuals for specific jobs. These frameworks are hybrids that merge the tenets of objective, management, consumer, and experience-oriented program evaluations as described by Worthen et al. (1997). Phillips (1997) calls these evaluation frameworks "results-based" because they concentrate on determining the organizational contribution of human resources development (HRD) endeavors. They are comprehensive evaluations that serve as commercial program management tools. The goal is to achieve maximum organizational benefit for the best monetary expenditure. Kirkpatrick (1994) and Phillips best represent results-based program evaluation frameworks. Table 5 shows the Kirkpatrick (1975) four-level design.

Phillips used the four-level Kirkpatrick framework as a baseline for his evaluation process. He also elaborated on the levels of the Kirkpatrick framework to capture additional nuances attributable to ETD programs. Phillips' framework is shown in Table 6.

Table 5

*Kirkpatrick's Levels of Evaluation*

Level	Questions the Evaluation Answers
1. Reaction	Were the participants pleased with the program?
2. Learning	What did the participants learn in the program?
3. Behavior	Did the participants change their behavior based on what was learned?
4. Results	Did the change in behavior positively affect the organization?

Table 6

*Phillips' Five-Level ROI Framework*

Level	Measurement Description	Customer (target)
1. Reaction/Planned Action	participant's reaction to the program and outlines specific plans for implementation	Participants
2. Learning	skills, knowledge, or attitude changes	Participants
3. Job Applications	change in behavior on-the-job and specific application of the training material	Immediate Managers
4. Business Results	business impact of the program	Immediate/Senior Managers
5. Return on Investment (ROI)	monetary value of the results and costs for the program	Senior Managers/Executives

These two program evaluation frameworks are primarily targeted for ETD programs conducted in industry. The contribution the ETD frameworks made in the creation of the conceptual system model was identifying the development strategy of measuring tangible program benefits determined by the participants.

Phillips acknowledged that his framework is not applicable in its entirety to public sector education program evaluations. This is due to the ability of a HRD program to design ETD programs using different experimental designs to determine or isolate the effects of training. Comprehensive public sector education policy has difficulty in accomplishing the same measurements for social, moral, and ethical reasons. The underlying premise of his framework as a program management tool is characterized by his observation:

The training and development function has played a significant role in the implementation of major change programs such as total quality management, reengineering, and continuous process improvement. The training and development function has been an integral part of the process, serving initially in a support role and eventually, in some organizations, as driver of change. (p. 23)

The consumer-oriented evaluation approaches produced another system development strategy that indicates the need to follow up with the participants and their employers. The use of consumer-oriented program evaluation components enhances the utilization of the evaluation data as a program management tool resulting in continuous program improvement.

### Institutional Perspectives of Program Evaluation

Because public policy is the focus of this research effort, the utilitarian/institutionist-plural program evaluation continuum identified by Worthen et al. (1997) should also be viewed from the perspective of institutional intentions in creating the policy. This continuum depends on the roles of the evaluator and the evaluated. However, what are the motivations of the institution that produced the policy? Are the institution's goals to assure that the policy is doing what it is intended to do? Political science scholars explore these questions within subject area called "regime emergence and persistence" (Hasenclever, Mayer, & Rittberger, 1997). Keohane (1984) argued:

Functional explanations in social theory are generally post hoc in nature. We observe such institutions and then rationalize their existence. Rational-choice theory, as applied to social institutions, assume that institutions can be accounted for by examining the incentives facing the actors who created and maintain them. Institutions exist because they could have been expected to increase the welfare of their creators. (p. 80)

This argument is less pessimistic than it initially sounds. Hasenclever et al. (1997) elaborated on the intentions of Keohane's functional explanation:

Keohane applies this functional perspective to both regime formation and regime maintenance, developing two different, yet internally linked arguments. Regimes reduce transaction costs, i.e. costs associated with the negotiation, monitoring, and enforcement of agreements. Creating a regime, on the other hand, is not cost-free, either. After all, regimes, which usually result from multilateral negotiations, are not unlike agreements themselves. Consequently, creating and maintaining a regime involves transaction costs

as well (Keohane 1988: 386f.). From a functional perspective, this means that actors will offset the costs of establishing a regime against the advantages to be expected from the regime. As the central advantage of a regime is that it enables actors to cooperate through agreements, states are more likely to create a regime if the set of potential mutually beneficial agreements in the issue-area is large or, in Keohane's (1984: 79, 90) words, the "policy space" is relatively dense. To put it differently, the more "efficient" (under given circumstances) a regime would be, the more likely it is to be created. (p. 37)

These observations offer two institutional attributes that must be incorporated into the policy analysis and ultimately into the systems that evaluate the policy effects. The first is cooperation between the actors when developing and executing the policy, therefore reducing the transaction costs. The second, which is a derivative of the cooperative efforts, is the efficiency of policy execution. Efficient policy execution benefits organizations by increasing their effectiveness and longevity as agencies of authority and responsibility. To develop program evaluation systems that are efficient in the ways they serve the institutions that created the policy is an additional design strategy. Efficiency would be to integrate data collected by multiple sources thus decreasing the "transaction costs" identified by Hasenclever et al. (1997).

Before conceiving this study, the researcher had always been intrigued with observations made by McDonnell and Grubb (1991). They observed:

Identifying relevant social and economic conditions and estimating their impact on particular policies are among the most difficult aspects of policy analysis. Such estimates must include likely demographic changes, downswings or upturns in either the national or regional economy, the structures of local labor markets, and even conditions outside

the United States. Policymakers frequently have little direct influence over these conditions, and they may be able to take them into account only in setting expectations for particular policies. Nevertheless, such an exercise is likely to lead to more realistic expectations about the ability of policy to alter behavior.

The unemployment rate—national or regional—is a key economic factor that can significantly affect the placement rates of education and training programs. It can also shape the kinds of people who are served by those programs...

Some of the growing complexity of the education and training system can be attributed to the responses of policymakers and institutional leaders to exogenous conditions. ... Yet state and local policymakers typically lack the data and staff resources to take into account any but the most general demographic and economic trends...

In sum, we can think of the context in which policy is implemented as a set of variables that are largely independent of individual instruments and the assumptions underlying them, but whose interaction with different policies may be significant in explaining the ability of those policies to achieve their intended effects. (p. 16)

Their observations are important because they identify policy-induced limitations that reduce the ability of evaluation systems to efficiently indicate discrete program benefits and keep transaction costs low. Arguments are built to support the thesis that policy development and performance must consider a wide range of variables and possible data sources to perform close to the policymakers' intentions. Demographic data collection and analysis, for example, is a complex process requiring low levels of data aggregation resulting in high levels of demographic characteristics discriminating power. There are also exogenous institutional resources that can

supply demographics and discrete characteristics data for comparison and contrast analysis. Combining similarly codified data from various resources could produce correlated measurements of discrete group characteristics that better indicate program performance to policymakers.

Furthermore, Fosler (1988) contended that:

...understanding the potential relationship between state policies and the broader economic and social context in which actions are taken requires knowledge in areas unfamiliar to most state governments, including market dynamics, institutions for human resource development and labor adjustment, changing technology, the evolution of regional economies, and patterns of international trade and investment. Until policymakers at all governmental levels have such information on a timely basis, education and training programs may be no more than blunt tools in efforts to respond to and influence larger socioeconomic trends. (p. 315)

Fosler's statement obliged the researcher to consider the relationships of the institutions that play integral roles in determining education and ultimately socioeconomic policies. To properly do a systems analysis, it is important to determine the organizational relationships that occur. The data each organization produces and how the data are used in policy formation, execution, and determination of effectiveness have an important relationship to the structure of the systems developed to support inter- and intra-agency activities.

The timeliness of data collection, analysis, and reporting are critical to the utility of the information provided to policymakers. Time-based data collection activities such as longitudinal measurements may provide strong indications of socioeconomic change that occur within

economic sectors and/or be sensitive to regional economic changes that may have nothing to do with workforce availability or training.

In summary, when the researcher first read the analysis by McDonnell and Grubb, he saw a number of distinct problems that could be addressed with the development of a program evaluation system structured as a program management tool using contemporary information systems technology. This system should be able to collect data, perform the data analysis, and report the findings to a broad audience in a timely manner and in a context that is usable to them, and be available to other systems for detailed analyses of broader socioeconomic conditions.

The four system development strategies come from the interpretation of this treatise:

1. The system must provide feedback to policymakers at local, state, and national levels (see Table 7 – Strategy 4).
2. The system must be capable of data integration with endogenous and exogenous sources (see Table 7 – Strategies 2 and 6).
3. The measurements must reflect changes that may be attributable to market dynamics, education and training characteristics, and/or advances in technology (see Table 7 – Strategies 2, 3 and 5).
4. The system must efficiently collect, analyze, and report data in a timely manner (see Table 7 – Strategies 4 and 7).

A treatise by Datta (1979), identified two determinants for quality and use of program evaluations in vocational education. The first is “ability” and the second is “willingness.” Ability was further characterized by Datta:

Evaluation reports which are long on methodology and short on unqualified

conclusions are failures for most policy purposes. Few evaluations, including vocational education studies, have enjoyed methodologically undisputed conclusions. Technical and practical preconditions for evaluations yielding unequivocal conclusions include: (1) the establishment of criteria for judging success which are related to legislative purposes; (2) the determination of standards for judging acceptable levels of achievement on these criteria; (3) the ability to take process and context into account before reaching judgments on outcomes; (4) the development of levels of tolerable certainty and uncertainty for judgments; (5) trade-offs among agencies in cost, accuracy, and ownership of data collection, analysis, and reporting; (6) establishing evaluation resources - competent staff, with adequate authority and money; and, in a practical sense, (7) use of preexisting non-vocational education data systems at state and local levels. (p. 50)

The seven identified “preconditions” are very good guidelines for designing an evaluation system that would provide high-quality data for program change and policymaker feedback. However, Datta continued with the “willingness” determinant of conducting a high-quality program evaluation. This determinant is the practical reality that confronts everyone responsible for the design of program evaluations. Datta described evaluation participation “willingness” reasons in the following:

A number of reasons are given for previous shortfalls in implementing federal evaluation requirements. People may be unwilling to cooperate with evaluation requirements when they fear the results will be used to close off funds, when they have too many other things to do, and when the rewards are greater for doing something else. (p. 64)

Datta considered these reasons as dissuaders to successfully conducting a vocational education program evaluation. Unwillingness to cooperate with the evaluation requirements occurs at the federal, state, and local levels.

Datta identified an additional source of “unwillingness” she called “debilitating low morale.” This source of unwillingness occurs when the evaluation “demands greatly exceed possibility.” Resources at the local education agency (LEA) level are becoming overburdened with operational and programmatic mandates from the state and federal government. This situation may exemplify the condition that creates debilitating low morale with the possibility of placing a number of program outcomes in jeopardy because of non-compliance. The treatise by Datta was particularly constructive in developing the final strategy (Table 7 – Strategy 8) that making the system “usable” increases the abilities and willingness of all groups using the system.

### Practical Applications and Practices

In 1998, a document was presented to career and technical educators and administrators designed to address some of the deficiencies in collecting, analyzing, and reporting data. The primary purpose was to encourage local education agencies to use data more effectively in determining program quality. The title of the document was *At Your Fingertips: Using Everyday Data to Improve Schools* and was written by Levesque, Bradby, Rossi, and Teitelbaum (1998). The publication is a practical, hands-on attempt to merge the qualitative and quantitative aspects of educational program evaluation at the local level. This work was targeted to LEAs and implied that there is a translation of data to and from the state and federal domains that can be

used to complement local measurements. The preface written by Hoachlander and Mandel provided an insight into the publication's intentions by stating:

A school that is willing to examine itself critically is one that will increase the odds that its students will succeed. Such a school will also find that it has a new and effective means to communicate in a very powerful way with its parents, others in the system, and the community at large. In fact, just sharing information about how the school is functioning is such an unusual act that it will often yield a measure of good will that is invaluable to efforts to test new curricular and instructional approaches. Internally, the availability of such information can lead to a new and healthy conversation among the faculty—one that promotes reflection on practice, healthy skepticism about trendy ideas, and a school culture that values professional knowledge and expertise and finds ways to channel and use it to yield the greatest good for the greatest number. ... (in Levesque et al., 1998, p. iv)

*At Your Fingertips* was released prior to the formal enacting of the Perkins III legislation and the Workforce Investment Act in 1998. It pointed out that data collected at discrete levels in the education system could have utility to other levels and even other organizations and/or agencies. This reinforces the system development strategies developed in this chapter. It does so by looking at the utility of information from the local school vantage point. Vertical integration allows the information to be used in multiple reporting applications at various levels. Systems that require data to be collected at the SEA level to comply with state and federal protocols could uniformly collect data from systems that reside at the LEAs. The combination of high local utility and vertical integration would increase the ability and willingness of the LEAs and SEAs.

The ultimate utility would be derived when the SEA could supply multiple reports and analyses based on the vertically integrated systems that support a broad spectrum of constituents that include researchers and the public.

### Summary of Program Evaluation Literature

The literature review presented above offers perspectives on how others theorize and practice program evaluations. The goal in presenting these various viewpoints was to concentrate on policy and program evaluation aspects that help identify strategies to develop a system model that satisfies the policy-mandated program accountability requirements. Many theoretical frameworks in both the policy and program evaluation domains could have been considered. Doing this, however, would have introduced confounding arguments that are beyond the scope of this system analysis.

Table 7 summarizes the system development strategies, uncovered from the literature review, which are applicable to this study. The input parameters (see Table 2) were fully developed, yielding the output parameters (see Table 3) in the form of a conceptual system model from these strategies and the policy analysis conducted in the next chapter.

Table 7

*System Development Strategies Derived from Program Evaluation Theories and Practices*

System Development Strategies	Description
1. Utilitarian program evaluation	<ul style="list-style-type: none"> <li>a. design the system to be policy objective-oriented</li> <li>b. satisfies the institutional requirements and specifications</li> <li>c. objective roles of the evaluators</li> </ul>
2. Isolates the effects of the program	has discriminating properties that measures the policy intentions relative to the participants' performance to objectives and derived benefits
3. Assists in determining program improvement	the system is consistent so that the measurements indicate attributable variations
4. Used as a program management tool	timely and uniform data are available to organizations that can react to performance indications (federal, state and local)
5. Follows-up the program participants	includes a consumer-oriented component that looks at program participants' reactions and employers' business results
6. Integrates data from multiple sources	system designed with capabilities to share and use data from other sources
7. Uses technology that improves system performance	<ul style="list-style-type: none"> <li>a. available to all program participants</li> <li>b. minimal learning curve to use</li> <li>c. keeps the "transaction costs" low</li> <li>d. vertically integrated to serve the needs of multiple organizations</li> <li>e. rapid development and change capabilities</li> <li>f. usable over a number of program cycles</li> </ul>
8. Makes the system "usable" to the participants	design the system to increase both "ability" and "willingness" of the participating groups

## CHAPTER III

### POLICY REVIEW AND ANALYSIS

The purpose of this chapter is to develop specific policy-based program evaluation system requirements. A federal education policy was chosen to serve as the test case for this portion of the study. The researcher selected this policy because of his familiarity with objectives and delivery of career and technical education (CTE). The review and analysis in this chapter used the lexis in the federal CTE legislation to develop program evaluation system strategies and requirements (see Appendix A).

In October 1998, President Clinton signed into law the Carl D. Perkins Vocational and Applied Technology Education Act. It was the third iteration of the original Perkins legislation enacted in 1984 and is often referred to as Perkins III. State education agencies (SEAs) had a high degree of freedom to design program evaluation systems under the first iteration of the Perkins Act. In the 1990 re-authorization (Perkins II), the requirements for program evaluation concentrated on a programmatic assessment within the first six months of enacting the legislation. This state assessment would determine the “quality of its vocational education programs” before developing a comprehensive state plan (American Vocational Association [AVA], 1990, 1992). The assessment would serve as the basis for developing, under the supervision of a Committee of Practitioners, a statewide system of core standards and measures of performance for secondary, postsecondary, and adult vocational education programs. The outcomes for each core standard and measure would be reported annually to the federal government.

The latest Perkins Act re-constitutes a number of the ideas and intentions of the original legislation and the 1990 amendments that followed. Congress had two primary objectives for Perkins III. The AVA (1998) characterized these objectives as follows:

The first was to consolidate and combine the myriad of separate programs that had been created over the years into a more cohesive, streamlined program. The second objective was to reduce the federal requirements and presence in largely local- and state-funded education programs by “blockgranting” the programs and the funds to state governments to administer as they see fit. (p. 8)

The first objective was to make the process simpler and less cumbersome for the states and localities. Second, “get the money to the classroom” was the rallying cry for many in Congress that felt education programs were mired in bureaucracy. The new legislation was to reduce the burdens on the states and gave the Governors more discretionary authority with the federal funds. Most importantly for this study, there is great interest in the government and socially to hold institutions accountable for their actions. This attitude has pervaded many federal, state, and local policies. The 1998 amendments to the Perkins Act were no exception. The program may be easier to administer and get the funding to the right places, but there is an expectation of tangible program performance gains. Perkins III also was the transition point from the old vocational education model to career and technical education.

In the Carl D. Perkins Vocational and Applied Technology Education Act (1998), Section 113 is titled “Accountability.” This section of the 1998 Perkins Act specifies program evaluation system requirements.

The purpose of this section is to establish a State performance accountability system, comprised of the activities described in this section, to assess the effectiveness of the State in achieving statewide progress in vocational and technical education, and to optimize the return on investment of Federal funds in vocational and technical education activities. (Section 113 – Paragraph a)

Elson, Oliver, Strickland, and Perry (1992) identified factors that contribute to a quality program evaluation. These factors were “a major event, a clear policy direction, leadership, administrative commitment, interagency cooperation, some form of regional administration structure, a planning/evaluation and data collection system, comprehensive programs” (p. 14). Perkins III accountability builds on the developed core standards and measures that were requirements of the 1990 predecessor Perkins legislation and serves as the “major event” identified by Elson et al. The capability to collect, analyze, and report these data becomes a requirement of the program evaluation system design.

The “Core Indicators of Performance” of the current legislation are enhancements of the Core Standards and Measures developed by the SEAs to comply with the 1990 Act, to be used as measures of program effectiveness (accountability). The AVA publication (1998), in its analysis of the accountability section, elaborated on the intentions and some pitfalls of the performance measurements. The AVA section 113 summary was:

Increased accountability is a cornerstone of the new Act, and states will need to adjust to new data collection and reporting requirements. At the very least, states must report student achievement in a way they never have before.

The law's accountability requirements are complex and couched in language that may be open to interpretation. It calls for each state, in cooperation with the U.S. Education Department, to set expected performance levels for four categories:

- Student attainment of vocational, technical and academic skill proficiencies.
- Acquisition of secondary or postsecondary degrees or credentials.
- Placement and retention in postsecondary education or employment.
- Completion of vocational and technical programs that lead to nontraditional training and employment (meaning fields in which one gender accounts for less than a quarter of the participants).

The performance levels for these "core indicators" must be expressed in percentages or numbers to make sure they are "objective, quantifiable and measurable." The Perkins Act also requires states to "continually make progress toward improving the performance of vocational and technical education students." Each state will have to make public how well it meets the expected performance levels; the Education Department will pass the results to Congress and issue state-by-state comparisons.

If a state fails to meet its performance levels and does not establish a plan to improve, the department can withhold all or part of a state's vocational education funding. Conversely, a new incentive program is created to reward states that exceed their performance levels.

The 1990 law required states to develop performance measures for the first time. Up to now states have tracked student learning and competency gains and measured attainment of certain occupational competencies. But these performance measures are not nearly so extensive as those required by the new Perkins Act, and it's unclear how state-mandated academic standards will fit with the academic requirements in the 1998 Perkins Act. (p. 12)

Michael Brustein actively participated in the formation of Perkins III and the development of implementation plans for the SEAs. His legal firm reviewed the Act and performed liaison duties from the perspective of state administration responsibilities in fulfilling the requirements of Perkins III. His first observation was that two distinct groups were being evaluated in the core performance indicators. He posited these questions to the federal Office of Vocational and Adult Education (OVAE). Brustein (Brustein & Manasevit, 1999a) asked, “Is there an expectation that there will be performance measures listed for each: secondary, adult, and postsecondary tech ed programs? Is there a minimum number of measures expected?” (p. 13)

OVAE responded in the following statement:

Section 113(b)(2)(A)(i-iv) lists the core indicators and identifies some as unique to secondary and others as unique to postsecondary. Those not identified as applying to only secondary or only postsecondary apply to both. In all cases (secondary only, postsecondary only, or secondary and postsecondary), all core indicators apply as well to the Tech Prep Education program in a State. (Brustein (Brustein & Manasevit, 1999a, p. 13)

Brustein's analysis of the core performance indicators included additional system and data requirements. Measurements of secondary CTE participation are where the program evaluation system will have to start gathering information. Participation will include those people who either complete entire CTE programs or participate but do not complete programs. Data must also be collected on the individuals in the participating group who earned their high school diploma and those who did not.

Core performance indicators are expanded to include academic and CTE competency measures. State-developed high school summative academic assessment scores will have to be collected for the participating group. CTE program completers will also have skill proficiency and/or licensure assessment measurements data collected and stored in the program evaluation system.

The Act's accountability language, "Placement in, retention in, and completion of, postsecondary education or advanced training, military service, or placement or retention in employment" [Section 113(b)(2)(A)(iii)] has very specific requirements for data collection and the collection sequence. A longitudinal follow-up evaluation design is necessitated to accomplish the data collection process. When students leave high school, their educational and/or occupational pursuits are of interest to the federal government. Measurement of retention in education and/or employment requires cooperation among education institutions, labor organizations, and employers. A system design requirement would have integrated databases collect data from these various organizations to fulfill the federal and state reporting requirements. The SEAs and state departments of labor would be the best place to coordinate these system functions. Furthermore, the state agency systems should be integrated with federal

agencies, including the military and prisons, to fully capture the data requirements of “retention” in education and/or employment. This addresses the arguments presented by McDonnell and Grubb (1991) and in particular the Fosler (1988) observation of the importance in using multiple information resources to capture socio-economic influences.

The placement and retention in postsecondary education or employment core indicator affords a great opportunity as a valuable measure of program effectiveness while simultaneously presenting the program evaluation designers a complex problem. Longitudinal follow-up data collection has applicability to ascertain all four core indicators inquiries. Vocational education has always had input from employers and labor in designing curricula and offering career exploration/experience opportunities. The states will have to develop systems to collect data from higher education, postsecondary, and employers to satisfy this core indicator’s requirements. Data coding structures will have to be unified to share data without re-codification for each agency report. None of the core indicator requirements introduces problems that cannot be overcome technologically; however, from organizational and cost perspectives, this could pose some difficulty. Yet, these difficulties have needed addressing for some time if the information is to be used effectively for socioeconomic policy decision-making.

Section 114 – National Activities, section (a)(2) as well as Section 118 – Occupational and Employment Information both emphasize requirements for compatibility and usage of integrated data sources for education and employment endeavors on state and national levels. Section 114 (a)(3) specifies that the National Center for Education Statistics (NCES) must collect information from a nationally representative sample to determine the performance of CTE with the possibility of comparison analyses with international programs.

Section 122 – State Plan provides a description of what composes the five-year plan each State is required to submit to the Secretary of Education. Paragraph (c)(6) of Section 122 specifies that the state plan must describe how an annual evaluation of program effectiveness would be conducted. The State plan must also “describe how the eligible agency will report data relating to students participating in CTE in order to adequately measure progress of the students, including special populations” [Section 122(c)(12)]. Section 122(c)(20) states, “describes how the eligible agency will ensure that the data reported to the eligible agency from local education agencies and eligible institutions under this title and the eligible agency data reports to the Secretary is complete, accurate and reliable;...” Additionally, the State plan must articulate the recognition and avoidance of duplicating efforts by other Federal programs.

Four system design requirements were identified from the previous policy analysis. First, the state program evaluation is to be conducted annually. The second design requirement is, all participating CTE students must be included in the program evaluation. Sampling is not specifically disallowed but the measurement must be representative and indicative of the state’s CTE program effectiveness. Derived from Section 122 is the third system requirement: the program evaluation system must collect, analyze, and report data in a valid and reliable manner. The fourth system requirement is that duplication of efforts among federal and state agencies must be avoided.

Specifically identified in Section 113 – Accountability are targeted groups and people with special needs. These groups were included in the original Perkins Act and in all the amendments that followed. Perkins III sections on state planning [Section 122(c)(16)] and accountability as

distinct groups [Section 113(c)(2)] specify the data collection and reporting requirements.

Section 3 of the Perkins Act identifies these groups as:

Cooperative Education (participants)

Tech Prep Program (participants)

Non-traditional Students (less than 25% of a gender in an occupation)

School Dropouts

Special Populations

- Individuals with disabilities
- Individuals from economically disadvantaged families including foster children
- Individuals preparing for non-traditional training or employment
- Single parents, including single pregnant women
- Displaced homemakers
- Individuals with other barriers to educational achievement, including individuals with Limited English proficiency

Advanced technology in the delivery of education and training programs was specified as a component of the State plan. The Perkins Act in Section 122(c)(1)(A) requires access to state-of-the-art technology in CTE. Development of new technology and improvement of existing technology by the schools (eligible recipients) will be funded under the Act. Access to and utilization of technology will have to be determined in the program evaluation. Experiential and exploratory learning opportunities using technology in the high schools, vocational technical centers, community colleges, or actual industrial settings should be measured for career relevance. A system design requirement, although not specifically identified in core indicators of

the Act, should have the program evaluation system inquire about the levels of exposure and preparedness to use technology in the workplace or in the pursuit of additional education. Both the program participants and employers should be asked these questions. The data collected from schools, student/participants, and employers should support the intentions of the Perkins Act and the reporting sub-systems used by the public, schools, and policymakers. This also satisfies the “consumer-oriented” program evaluation system strategy (Table 7 – Strategy 5) developed in Chapter II.

#### Integration of Perkins III and the Workforce Investment Act

In Sections 121 and 122 of the Perkins Act, there is specified a coordination with Department of Labor programs. This coordination is the submission by the States of a “Unified Plan” that fulfills the program planning requirements for multiple labor programs identified in the Workforce Investment Act (WIA) of 1998 (United States Congress, 1998b) and Perkins Act. This promotes communication between agencies on the planning, development and implementation of program evaluation systems.

Brustein (Burstein & Manasevit, 1999a) also observed the interagency relationship between the Departments of Education and Labor the legislation established. The Department of Education would be the administrator of the accountability aspects of Perkins III, and the Department of Labor would supply and receive data for determining CTE program effectiveness in the development of the workforce. This observation leads to another system requirement. The program evaluation systems would be located at the state level to serve state and local needs. The SEA systems would then be vertically integrated into a federal system that would serve the

national needs for determining CTE program effectiveness. This level of program evaluation system integration would satisfy the placement and retention components of the Perkins III accountability section.

### Policy Review and Analysis Summary

The Perkins Act of 1998 offers program evaluation designers many challenges and opportunities. The coordination of planning activities and systems design is essential to successfully accomplishing the accountability requirements of the policy. Use of advanced information management technology and data communications systems is necessary to provide the integrated data environment prescribed by the Departments of Education and Labor. The SEAs are the stewards for these activities and assume the roles of coordinator, developer, promoter, fiscal agent, and enforcer. This requires special organizational and technical skills. To that end, the Federal government, LEAs, industry, and labor must be available to the SEAs to make the policy work.

The program evaluation conducted by the States in compliance with the Perkins Act is a large task. From the Perkins Act program planning and accountability specifications and expectations presented above, the evaluation system must capture discrete characteristics of the CTE clientele over a period time to determine program effectiveness and continuous performance improvement. This must be accomplished in a way that will accommodate data analysis that compares data available from other agencies at the federal and international levels.

Table 8 summarizes the policy system and data requirements determined from the Perkins III and WIA legislation. The policy system and data requirements are also contrasted with the

system development strategies developed in Chapter II. System analysis input parameters are also shown in the table. Some policy system and data requirements were related to multiple input parameters. Technology is not specified directly in either the Perkins Act or WIA. This is not a limitation of the policies. The policies avoid technology specifications to allow the SEAs the greatest creative latitude in developing systems to comply with the policy requirements.

Table 8

*Summary of the Perkins III Policy System or Data Requirements with Respect to the System Development Strategies from Chapter II*

System Development Strategies	Input Parameter(s) (see Table 2)	Description	Policy System or Data Requirements
1. Utilitarian program evaluation	Legislation and Organization	a. design the system to be policy objective-oriented b. satisfies the institutional requirements and specifications c. objective roles of the evaluators	Collect, analyze, and report data to satisfy the accountability requirements  Satisfies both state and federal program requirements
2. Isolates the effects of the program	Legislation	Discriminating properties that measures the policy intentions relative to the participant's performance to objectives and derived benefits	Measurement of core performance indicators (academic and vocational), including completion and longitudinal measures to determine placement and retention characteristics
3. Assists in determining program improvement	Legislation	System is consistent so that the measurements indicate attributable variations	Must support SEA continuous improvement of career and technical education programs

Table 8 (continued)

System Development Strategies	Input Parameter(s) (see Table 2)	Description	Policy System or Data Requirements
4. Used as a program management tool	Legislation and Organization	Timely and uniform data are available to organizations that can react to performance indicators (federal, state, and local)	System supports interagency policy analysis and reporting at local, state, and federal levels  Supports federal research initiatives
6. Integrates data from multiple sources	Legislation and Technology and Information Sources	System designed with capabilities to share and use data from other sources	Unification of data collection process  Shared responsibility between Departments of Education and Labor
7. Uses technology that improves system performance	Technology	<ul style="list-style-type: none"> <li>a. available to all program participants</li> <li>b. minimal learning curve to use</li> <li>c. keeps the “transaction costs” low</li> <li>d. vertically integrated to serve the needs of multiple organizations</li> <li>e. rapid development and change capabilities</li> <li>f. usable over a number of program cycles</li> </ul>	Not a policy requirement to use in the evaluation process  Technology is an expected proficiency of students that are involved in CTE  Improves the validity and reliability of data collection and handling
8. Make the system “usable” to the participants	Legislation and Technology	System designed to increase both “ability” and “willingness” of the participating groups	Conducted annually  Includes all vocational program completers and participants  Data reported in valid and reliable manner  Avoids duplication between and among agencies

The policy data requirements and system development strategies will serve as the criteria for developing the conceptual system model to perform the secondary CTE program evaluation.

Chapter IV develops the conceptual systems model and an implementation sequence to satisfy the system strategies and policy system and data requirements. The system strategies and policy system and data requirements are also the first output parameter (Requirements - see Table 3) of the systems analysis this study was designed to conduct.

## CHAPTER IV

### SYSTEMS ANALYSIS AND MODEL DEVELOPMENT

In this chapter, the theory-founded system development strategies from Chapter II and the policy-based system requirements from Chapter III are used to conceptually model a CTE program evaluation system. Developing the conceptual system model was a synthesis of policy, organizational, and systems analyses that “operationalized” the intentions of the Perkins Act. The program evaluation system design considered the utility of data as they pertain to supporting state and local school planning and operations activities. While compliance with federal reporting requirements was the foremost goal, a well-designed information system should offer greater utility to everyone who has interests in educational outcomes.

#### Institutional Relationships

In production systems, the goals of “continuous process improvement” were articulated by Demming (1975, 1982). Industries were interested in adopting the concepts but had reservations about the system development and implementation. Manufacturing processes with integrated quality functions demonstrated that precision process control was achievable if instrumented and measured properly. The only proviso is that the entire process, from concept to final product delivery, including customer satisfaction, has designed into it continuous process improvement. Boiled down, the organization must measure better, use data better, and communicate better with internal and external customers and suppliers.

Policymakers have also adopted the concepts of “continuous process improvement.” Perkins III specifically identified “continuous improvement” as a programmatic goal (Appendix A – Section 113(b)(3)(A)(i)(II)). The objective was to have change become an accepted and many times planned activity. The intended results were responsiveness to education and market changes by developing, using, and believing measurements will help CTE prepare the workforce to participate in the domestic and global markets. To accomplish this, Perkins III promoted the use of data to drive organizational and operational changes in the secondary and postsecondary education processes.

However, what about the philosophy of education and the policies developed to coordinate this social endeavor (see Table 2)? An educated citizenry can participate in the political and economic processes that form a democratic nation state. Each government level has a mandate from the public to make education work, but government alone is not responsible for education. It is a participatory activity represented by social, political, and economic concerns. Information is what will satiate the needs for educational performance from all socioeconomic sectors.

Education, government, industry, and labor will have to work together to develop new measurements that go beyond traditional compliance-structured educational program evaluations. SEAs must have input from education (LEAs), government (local, state, and federal), industry, and labor to develop comprehensive state plans for CTE (Appendix A - Section 122).

Beyond the planning activities, the operational phase must have involvement of these four institutions to achieve continuous program improvement, as well as the placement and retention measurements specified in the Perkins III accountability section (Appendix A - Section 113).

The technologies to conduct these measurements are available. If we merge the Perkins III policy, the organizational concept of continuous program improvement, and available technologies, can a program evaluation system for continuous process improvement be developed? The answer is yes, and it will depend on the active participation of education, government, industry, and labor.

In the scheme of things, the federal government shares sponsorship of secondary CTE programs with (a) the SEAs responsible for executing the policy, and (b) the LEAs responsible for providing the programs. Beyond the education policy functions that SEAs manage, interfaces between government, industry, labor, and the public must also be coordinated. This organizational structure and policy-mandated institutional relationships establish a culture intended to improve CTE programs that enhance social well-being and productivity. Without consideration of institutional relationships, the systems analysis would decay into a functional study of what technologies are necessary to satisfy the legislative requirements.

### *System Users*

“System user” is a term that identifies the institutions or organizations that will use the system. System users have requirements for data collection, analysis, and reporting to satisfy inter- or intra-agency needs. The technologies used in the design of the program evaluation system must match the skills of the system users. In most instances, the system users will require training to use the system. They must also be included when the program evaluation is planned and consulted during the system validation. The training and development of system users

becomes a design consideration that determines the technologies used in the evaluation system configuration.

One of the arguments presented in Chapter II introduced the ideas of “abilities” and “willingness” of organizations to participate in the program evaluation process. Systems users are those people who make those determinations. Abilities beg the question: Can we do it? Willingness is the extent that an organization will participate in the process. The discussion below focuses on the system users needs to accomplish the program evaluation and identifies the participation incentives for each organization.

*Government.* The institution of government is composed of federal, state, and local entities. Federal and state governments historically were interested in whether vocational education was preparing young adults for careers. In Perkins III, policy interests were to take into account socioeconomic changes affecting the role of CTE. Merging of academic (abstract) and vocational (experiential) programs forming new curriculum approaches has been emphasized by education scholars and practitioners since the early 1990s and articulated by the National Assessment of Vocational Education (Boesel & McFarland, 1994; Wirt, Muraskin, Goodwin, & Meyer, 1989). The government through legislation has recognized the need to prepare a better educated and trained workforce capable of filling positions in a continuously changing workplace.

Information the government is most interested in is feedback for policy decisions. Perkins III expresses the government information needs for program accountability (Section 113), state planning (Section 121), and national planning (Section 122). By expressing these information needs, a program evaluation system is broadly described. The information produced by this

program evaluation system must satisfy the federal reporting requirements for public policy feedback to the Congress.

*Education.* A number of states have adopted standards of learning or similar criteria-referenced programs for their public education systems; SEAs are responsible for the administration of these programs. In consultation with internal agencies and independent consultants, methods for assessment and evaluation were devised to measure mastery of the learning standards at various intervals in the education process. The results of these measurements are used to identify problematic areas, and if the assessment data are valid and reliable, take an appropriate corrective course of action indicated by the data. In Virginia, for example, the Standards of Learning assessments have been used to measure individual student accomplishment but are also used for school system accountability. There is potential for punitive action if the schools do not perform well on the assessments. These actions include loss of accreditation and/or removal of administrative and instructional personnel. The program evaluation system to comply with the requirements of Perkins III must be capable of integration with state education requirements. This is not just a desirable system design parameter, but also a necessary design requirement to reduce the “transaction costs” as discussed in Chapter II.

The SEAs are the policy convergence organizations for the Perkins Act. The program evaluation needs of the SEAs are the most immediate because the data must satisfy the Perkins Act requirements. Efficient and accurate collection, analysis, and reporting of the data are essential. Utility of the data are the second concern because of the SEAs’ liaison role between the federal and state governments and the LEAs.

Local school systems are referred to in the Perkins Act as “eligible organizations” and responsible for using the funding and SEA leadership services provided to best serve the needs of their students. The LEA regulations are rigorous for using the Perkins III funding under the purview of the SEAs. The information produced by the program evaluation system may provide additional school management resources if the information is accessible to school systems in a timely manner and at an aggregation level that would offer local program analysis. If properly designed, the system would offer opportunities for school systems to conduct analyses resulting in better-informed school administration, faculties, students, and parents. This would support local education administration and operations.

The data collected could also support internal and external research efforts by individuals and organizations. An example of this would be private or university sponsored education policy research. The validity and reliability of the system measurements could be tested by alternative organizations with the possibility of improving measurement protocols and instrumentation.

*Industry and labor.* These two sectors are combined because in many regards, they have mutual interests. Workforce development is an example of one mutual interest. In the state planning section (Section 121) of the Perkins Act, both of these organizations are to be included in the planning process. Information to and from these organizations would make them better participants in the process of preparing people for work and retaining them in the workforce as economic contributors.

Industry and labor have fiducial responsibilities to the economic performance of the society. To measure economic performance, systems that offer access to statistics on workforce

education and career preparation have great value. The Perkins Act specifies that data will be used by the National Center for Education Statistics (NCES) for reporting education performance measurements at pre-determined intervals. Coordinated data collection and analysis between the Departments of Education and Labor was specified in Section 118 of the Perkins Act. The goal was to avoid duplication of agency efforts. If the program evaluation system is coordinated well at the SEA level, organizations like the National Bureau for Labor Statistics (NBLS) and the United States Census could provide and be provided with data that support their institutional missions. The integrity of workforce development and socioeconomic data available to industry and labor from these organizations could assist in better business forecasting.

Like the local schools, if the local industries and labor representatives are to serve as contributors to the planning process, would it not be advantageous to have data available to them “at their fingertips”? Hopefully, this inquiry is somewhat rhetorical because the ultimate goal is to improve the dialog between organizations.

*The public.* The public allows socially constructed institutions to exist. This group is composed of organized and individual information consumers. With information, the public group can exert their will upon institutions that usher in change. The abilities of this group to force change can be enormous. Information must be presented to the public that is indicative of how institutional policies have affected socioeconomic behavior. Education is of particular interest to this group because it inculcates the youth and develops individuals to participate in the society.

How institutions convey information is also important. Accurate characterization of a situation instills confidence in the institutions. Apple (1996) in his book titled *Cultural Politics*

*and Education* presented a very poignant arguments and the positions the public takes when looking at the contribution of education to national socioeconomic behavior:

The power of this alliance can be seen in a number of educational policies and proposals: (1) programs for "choice" such as voucher plans and tax credits to make schools more like the thoroughly idealized free-market economy; (2) the movement at national and state levels throughout the country to "raise standards" and mandate both teacher and student "competencies" and basic curricular goals and knowledge increasingly through the implementation of statewide and national testing; (3) the increasingly effective attacks on the school curriculum for its anti-family and anti-free-enterprise "bias," its secular humanism, its lack of patriotism, and its supposed neglect of the knowledge and values of the "Western tradition" and of "real knowledge"; and (4) the growing pressure to make the perceived needs of business and industry into the primary goals of the school.

In essence, the new alliance in favor of the conservative restoration has integrated education into a wider set of ideological commitments. The alliance's objectives in education are the same as those that guide its economic and social welfare goals. These include the expansion of the "free market," the drastic reduction of government responsibility for social needs (although the Clinton administration originally did mediate this in symbolic and not very extensive-or very expensive-ways), the reinforcement of intensely competitive structures of mobility, the lowering of people's expectations for economic security, and the popularization of what is clearly a form of social Darwinist thinking.

As I have argued at length elsewhere, the political Right in the United States has been very successful in mobilizing support against the educational system and its employees, often exporting the crisis in the economy to the schools. Thus, one of its major achievements has been to shift the blame for unemployment and underemployment, for the loss of economic competitiveness, and for the supposed breakdown of "traditional" values and standards in the family, education, and paid and unpaid workplaces, from the economic, cultural, and social policies and effects of dominant groups to the school and other public agencies. As I stated..., "public" now is the center of all evil; "private" is the center of all that is good. (p. 28)

If public policy program evaluation systems are to be developed that provide quality performance feedback for the purpose of continuous improvement, then this lack of institutional confidence about how information is used is a fundamental barrier that society must address. Personal data security designed into program evaluation systems would improve institutional confidence and the "willingness" of the participants.

### *System Requirements*

These institutional-derived requirements are a further expansion of the system requirements developed in Chapter III and based on system users' information needs available from the program evaluation system. Table 9 is a summary of these system requirements for the institutions discussed above. Information uses (see Table 8) describe what the users will do with the information and are the result of meeting the users' system requirements. In some

Table 9

*Institutional Information System Requirements and Uses for Program Evaluation*

Institutions	System User Organizations	System Requirements	Information Uses
Government	U.S. Congress	<ul style="list-style-type: none"> <li>• policymaker feedback</li> </ul>	<ul style="list-style-type: none"> <li>• program planning</li> <li>• legislation</li> </ul>
	State Legislative Branch	<ul style="list-style-type: none"> <li>• policymaker feedback</li> </ul>	<ul style="list-style-type: none"> <li>• program planning</li> <li>• legislation</li> </ul>
	Local Government	<ul style="list-style-type: none"> <li>• local ed./train. performance</li> <li>• workforce preparation</li> </ul>	<ul style="list-style-type: none"> <li>• policy development</li> <li>• business develop.</li> <li>• infrastructure plan.</li> </ul>
Education	U.S. Department of Education	<ul style="list-style-type: none"> <li>• data collection</li> <li>• analysis of data</li> <li>• reporting</li> <li>• common/shared data</li> <li>• policy compliance</li> <li>• information management</li> </ul>	<ul style="list-style-type: none"> <li>• policymaker feedback</li> <li>• program administration</li> <li>• development programs</li> <li>• funding allocations</li> <li>• disciplinary actions</li> <li>• performance rewards</li> <li>• inter-agency coordination</li> <li>• research</li> </ul>
	State Education Agency	<ul style="list-style-type: none"> <li>• data collection</li> <li>• analysis of data</li> <li>• reporting (fed., state, local)</li> <li>• common/shared data</li> <li>• policy compliance</li> <li>• information management</li> </ul>	<ul style="list-style-type: none"> <li>• policymaker feedback</li> <li>• program administration</li> <li>• development programs</li> <li>• funding allocations</li> <li>• disciplinary actions</li> <li>• performance rewards</li> <li>• curriculum planning</li> </ul>
	Post-secondary Education	<ul style="list-style-type: none"> <li>• education/training perform.</li> <li>• student demographics</li> <li>• graduate education plans</li> <li>• graduate career plans</li> </ul>	<ul style="list-style-type: none"> <li>• policymaker feedback</li> <li>• administrative plans</li> <li>• development programs</li> <li>• funding allocations</li> <li>• facility planning</li> <li>• curriculum planning</li> <li>• institutional research</li> <li>• promotion/marketing</li> </ul>
	Local School Systems	<ul style="list-style-type: none"> <li>• local ed./train. perform.</li> <li>• student demographics</li> <li>• graduate education plans</li> <li>• graduate career plans</li> </ul>	<ul style="list-style-type: none"> <li>• policymaker feedback</li> <li>• administrative plans</li> <li>• development programs</li> <li>• funding allocations</li> <li>• facility planning</li> <li>• curriculum planning</li> </ul>

Table 9 (cont.)

Institutions	System User Organizations	System Requirements	Information Uses
Industry	Chambers of Commerce	<ul style="list-style-type: none"> <li>• education and training performance</li> </ul>	<ul style="list-style-type: none"> <li>• program planning</li> <li>• business develop.</li> <li>• workforce develop.</li> </ul>
	Employers	<ul style="list-style-type: none"> <li>• education and training performance</li> </ul>	<ul style="list-style-type: none"> <li>• business planning</li> <li>• workforce develop.</li> <li>• political action</li> </ul>
Labor	U.S. Department of Labor	<ul style="list-style-type: none"> <li>• data collection</li> <li>• analysis of data</li> <li>• reporting</li> </ul>	<ul style="list-style-type: none"> <li>• policy development</li> <li>• program administration</li> <li>• development programs</li> <li>• funding allocations</li> <li>• disciplinary actions</li> <li>• performance rewards</li> <li>• inter-agency coordination</li> <li>• research</li> </ul>
	Organized Labor	<ul style="list-style-type: none"> <li>• policymaker feedback</li> <li>• workforce preparation</li> <li>• education and training performance</li> </ul>	<ul style="list-style-type: none"> <li>• policy development</li> <li>• workforce development</li> <li>• political action</li> </ul>
Society	Parents and Students	<ul style="list-style-type: none"> <li>• education and training performance</li> </ul>	<ul style="list-style-type: none"> <li>• school selection</li> <li>• career planning</li> <li>• policy participation</li> </ul>
	General Public	<ul style="list-style-type: none"> <li>• education and training performance</li> </ul>	<ul style="list-style-type: none"> <li>• policy participation</li> <li>• career planning</li> <li>• political action</li> </ul>

instances, system requirements for one institution will be the information developed for another group. An example of this is “policymaker feedback” (see Table 9). A system requirement for the U.S. Congress is to get Perkins III feedback for policy decisions. Policymaking feedback for this organization would be reports characterizing and analyzing program effectiveness with respect to policy goals. Qualitative and quantitative aspects would be reported. From the reports produced by the U.S. Department of Education program evaluation system, the Congress uses the information for program analysis, planning, and development of legislation serving their

constituents. Conversely, the U.S. Department of Education, as the agent for collection, analysis, and reporting of program performance, would use these data for policy improvement internally. They would “tune” their operations based on the information from the program evaluation system.

### *Program Improvement*

One of the primary goals of the Perkins Act is to show continuous program improvement. To accomplish this goal requires measurement of individuals participating in CTE over a number of iterations. In particular, the second and third core indicators (see Section 113 in Appendix A) of the Perkins Act require long-term measurements that determine if CTE assisted participants in achieving their career and/or education goals. This goes beyond evaluation of student skills and knowledge measurement before graduation from high school. A series of student/graduate follow-ups that would indicate career and/or education choices and the contribution CTE had in making those decisions and achieving goals. This fleshes out two program evaluation system design requirements: (a) need for a longitudinal measurement designed to follow-up CTE program completers and participants and; (b) use technology that will increase system user access, provide program administration benefits of automation and cost reduction per evaluation conducted. These two policy-based design requirements also agree with the general system development strategies found in Chapter II (see Table 7).

*Technology*

Up to this point, the input parameters of legislation, organization, and information sources have been discussed (see Table 2). Technology, although not specified in Perkins III, is the input parameter that is the backbone of the entire program evaluation system.

In the past, large-scale student/graduate vocational program evaluations were done using “bubble” forms printed and distributed to students that completed programs. The responses collected were then scanned and recorded in large files. These files were analyzed and reports generated based on the system requirements specified by users (in this case, the federal government and the Perkins Act). Reports were time-based and complied with the policy by supplying required information. Reporting formats were not flexible if both the state and federal education agencies were involved. The local levels would have to take what they were given, if they were given anything at all. High aggregation levels and restricted access limited the data analysis to primarily federal and state reporting.

Data collection was expensive and time consuming with moderate response rates. The data collected had to be screened for completeness and correctness. Form “completeness” checking is an undesirable activity to evaluation system designers because of excessive form handling and data analysis. Even with a well-structured and validated instrument, this situation occurred. To avoid throwing out good data, it was important to have disqualification criteria established before the collection of data. It is also a good practice to keep the disqualified forms and analyze the numbers and reasons for errors, then use these statistics for data collection system improvement. Response correlation analysis may be necessary to re-validate the data collection instrument if

question phrasing or instructions have been changed. This applies to mailed data collection forms or the data collection method discussed next.

The 1990s was the decade of Internet mass use. Information access at reasonable prices or, in many instances free, brought individuals, households, and organizations on to the “Net” in ever-increasing numbers. Low-cost computers and inexpensive large-capacity data storage coupled with an expanding network infrastructure made way for rapid applications development using the network as one option available for conducting commercial, scientific, and governmental operations. Some entrepreneurs had very progressive ideas and developed methods and systems that captured the utility of the Internet. These organizations, whether they succeeded or failed, developed operations and systems that matured the Internet, making it more useful in this decade.

With Internet advances came improvements in research methods in the social sciences. Never before could we do so much with the research protocols that had been developed over the years in CTE research. We now had improved:

- respondent access
- data collection
- analysis of data
- information management and dissemination capabilities.

It appears these concepts were understood and incorporated into the Perkins III program performance core indicators. System configuration latitude was provided to the states in the wording of the legislation, thus allowing the states to use systems they had in place or configure new systems that would serve the states’ interests as well as the federal reporting requirements.

New problems arose with using the Internet as one of the possible evaluation system delivery methods. One problem in particular was school, students, graduates, employers, parents, and individuals with special needs access and skills to use the Internet. Access to the Internet is improving everyday. Federal and state-sponsored programs, the Perkins Act (Section 135), Preparing Tomorrows Teachers to Use Technology (PT3) (United States Department of Education, 2003b) and the Teacher Quality Enhancement (TQE) (United States Department of Education, 2003c) grants are getting technology to the classrooms and teaching teachers how to use it effectively. Access to the Internet is available at public libraries, universities, community colleges, state one-stop career centers, and other locations. Usage assistance is also available at most of the public Internet access locations.

From these problems came four system design requirements that also conform to the general system development strategies in Chapter II (see Table 7):

1. improve access to those participating in the research by offering a variety of data collection and reporting methods (i.e., mailed bubble forms, telephone interviews, etc.)
2. make the use of the system easy for participants, requiring few technical skills and accommodate individuals with special needs
3. have the system handle the navigation through the data collection process based on participant responses, improving quality of data collected
4. collect the data in a timely manner to support program goals and efficient use of the participants' time.

*Design for Broader Integration*

The language of the Perkins Act continuously reinforces the notion of institutional collaboration in the policy planning and implementation. To collaborate effectively, information from multiple sources is necessary. The legislation specifically speaks to the integration of information sources. The Perkins Act in Section 122 provides an option for the states to develop a “unified plan” that integrates secondary and postsecondary CTE with programs sponsored by the U.S. Department of Labor. This promotes meeting the program evaluation criteria specified by the core indicators of state performance. To support the policy emphasis on institutional collaboration, information systems integration becomes another CTE program evaluation system requirement and conforms to the strategies in Chapter II.

*System Change Tolerance (Robustness)*

The technology section of this chapter suggested that the Internet offers great opportunities for conducting social science measurement and was added to the CTE system requirements for the conceptual system model. The previous section proposed that the program evaluation system be designed to work within an integrated systems environment. The system must be capable of rapid change without detrimentally affecting the system operation (including system security) and not requiring users to have proprietary technology. The term to describe this operational characteristic is system robustness. Chapter III discussed system robustness in reference to the provisions of Perkins III that allows states to revise their plans in the first year. The final CTE program evaluation system requirement is to use the Internet as the predominant method for data collection, reporting, and systems integration.

*Data and System Security Issues*

Data handling and security are two of the least-discussed subjects in the Perkins Act. It seems somewhat counterintuitive that with the intentions of the core indicators, this subject is not addressed with vigor. Section 5 of the Perkins Act has two paragraphs. The first paragraph refers to Section 444 of the General Education Provisions Act (GEPA) (United States Congress, 1984). This policy is very specific on issues of student records handling and privacy. From the GEPA comes an augmentation to the final CTE system requirement presented above. There must be access controls to allow only designated individuals to view or edit individual student records in the program evaluation system. Certain reports and database searches should be restricted to designated school system and state personnel because of the low aggregation level during the data collection phases. All publicly available reports will be composed of aggregated data not traceable to specific individuals. Cut-off levels based on the number of individuals responding should be set to preserve privacy by not identifying small groups in public reports. The access control system is maintained by the state and local education agencies. SEAs and LEAs determine the individuals that have system access and at what level.

Accomplishing the measurements to account for the Perkins Act core indicators is a formidable task. It requires an integrated systems environment supporting institutions operating in a collaborative mode to collect data, analyze it, and accurately report the findings that comply with the intent of legislation. Section 5, paragraph (b), specifically prohibits the formation of a national database of individuals who receive services under the Perkins Act.

There is one thing used nationally that identifies individuals, the Social Security Number (SSN). Many transactions in life are recorded referencing an individual's SSN. The CTE

program evaluation system must generate unique system identification numbers for those participating in the initial data collection at the state level. This unique identification may or may not be cross-referenced with an individual's SSN. The respondents during the initial demographics data collection are requested to supply their SSNs. The penalty will be that SSNs can be collected only from within each state during the compulsory education period and before high school graduation. After that point, the process of locating individuals who are not within the state will begin diminishing the response rates over the course of the longitudinal program evaluation process.

Secure Internet transactions between servers and clients are available using data encryption. Web browsers provide the secure transaction. Server software can also identify obsolete browsers that have security problems and deny access to the secure web site while simultaneously informing the respondent to update the browser. The most current Internet browser technology provides the best security (in most cases). Assuring the respondents that their privacy is of paramount importance will instill confidence in the program evaluation process.

Table 10 is a summary of the Perkins III policy-based system requirements and system strategies that have been developed using the program evaluation theories, policy analysis, organizational relationships, and technology representing the input parameters contribution to the system analysis. They are presented in Table 10 with the corresponding system requirement. One of the output parameters is requirements/constraints (system) and is based on the system analysis process.

It is now time to build the system model that conforms to the input parameters (Table 2) and is consistent with the output requirements and constraints. Although only one conceptual system model is developed, it is one of many possible configurations that could be used to address the legislative, organizational, technological, and information input parameters.

### Conceptual Program Evaluation System Model

The model was presented using three descriptive methods. The first descriptive method portrayed at the evaluation system constructs and functions (see Table 10). The database structure was described establishing how the data are managed by the system. The automation level of an evaluation system of this magnitude is very high requiring numerous points of access and security levels.

An information system flowchart was the second descriptive method used. The conceptual system was evaluated by detailing the program evaluation process flow. This identified the operations the system performs with respect to implementing the requirements of the Perkins Act and additional tasks that complement the program evaluation process at the school system level.

The technologies presented in the following text and in the system flowcharts are developed based on the researcher's experiences and background (see Vita). Technology references are located in Appendix B.

The third descriptive method put the system operations on a timeline. The purpose of using a time-base was to show the sequence of operations relative to the school year and the Perkins Act reporting cycles. This exposed a number of important reasons for using a high automation level in developing this conceptual system model.

Table 10

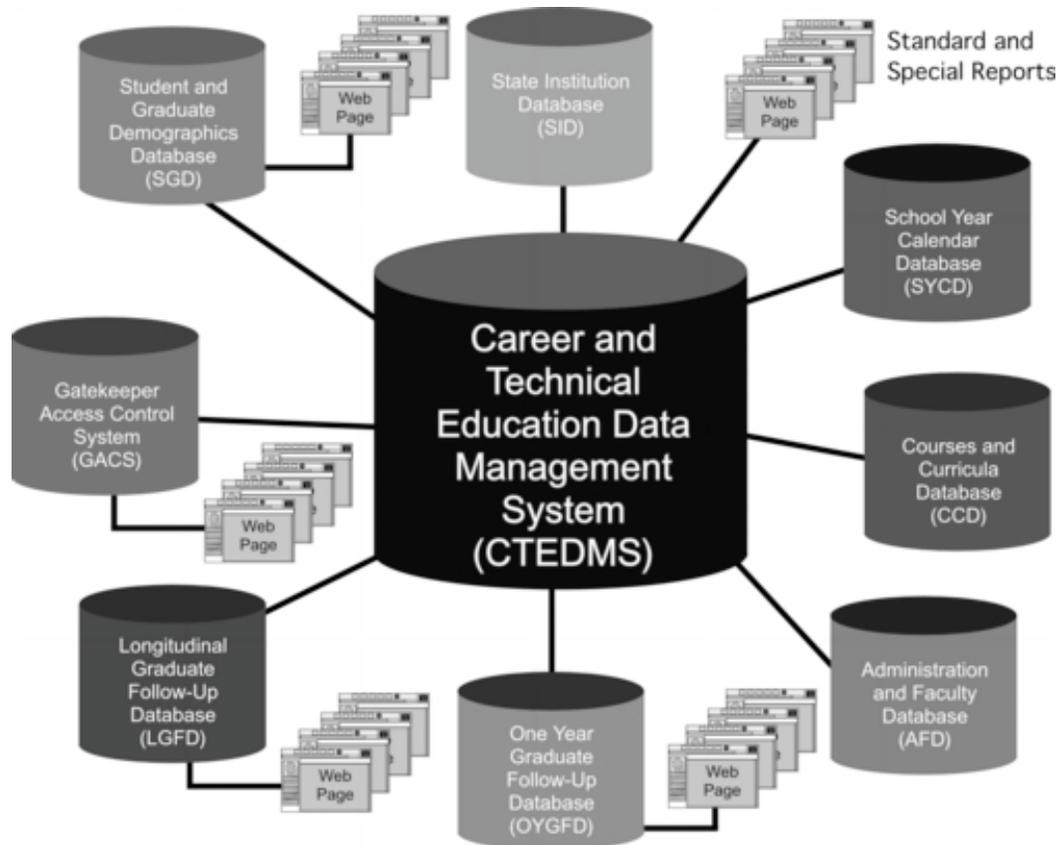
*Summary of Policy Requirements and System Strategies with Their Respective Program**Evaluation System Constructs and Functions*

Policy Req.	System Strategy	Description	Implementing Institution(s)	System Constructs/Functions	Reason/Usage
	√	Longitudinal Program Evaluation	SEA	<ul style="list-style-type: none"> <li>• Multi-year Follow-up</li> <li>• Student Demographics</li> <li>• Special Populations</li> <li>• Non-traditional Occupations</li> <li>• Prog. Completer/Participant</li> <li>• Academic Performance</li> <li>• Vocational Skills Attainment</li> <li>• Employment Status</li> <li>• Education Status</li> <li>• Job Satisfaction</li> <li>• Employer Comparison</li> <li>• Acad/Voc Skills Contribution</li> <li>• Quality of High School Education</li> </ul>	<ul style="list-style-type: none"> <li>• Perkins Act Core Indicators</li> <li>• Federal Program Planning</li> <li>• State Program Planning</li> <li>• Local Business/Labor Planning</li> <li>• Local School Operations And Planning</li> <li>• Postsecondary and Higher Education Planning</li> </ul>
	√	Integrated Systems	SEA	<ul style="list-style-type: none"> <li>• Inter/Intra Agency Data Exchange</li> <li>• Database Technology</li> <li>• Internet Data Communications</li> <li>• Secure Transactions</li> <li>• Low Level Data Aggregation at State Level</li> <li>• High Level Data Aggregation at Federal Level</li> <li>• User/Participant Access</li> <li>• Special Needs Access</li> </ul>	<ul style="list-style-type: none"> <li>• Perkins Act Core Indicators</li> <li>• System Efficiency</li> <li>• Cost Effectiveness</li> <li>• System Security</li> <li>• Rapid Prototyping</li> <li>• System Robustness</li> <li>• Change Management</li> <li>• State Level Only</li> <li>• Standard Based Technology</li> <li>• “On-line” User Training and Development</li> <li>• High Program Life-cycle Utility</li> <li>• Achieve High Response Rates</li> <li>• Special Needs Participation</li> <li>• Rapid Data Analysis</li> </ul>
√		Data Sharing	USDoE. USDoL SEA	<ul style="list-style-type: none"> <li>• Serve Multiple Program Requirements</li> </ul>	<ul style="list-style-type: none"> <li>• Perkins Act Compliance</li> <li>• Research Opportunities</li> </ul>
√	√	System Access Control	SEA	<ul style="list-style-type: none"> <li>• Individual Password Access</li> <li>• LEA/SEA Designated</li> <li>• Multi-level Access Control</li> <li>• Dynamic System Update</li> <li>• Time Based Revision</li> </ul>	<ul style="list-style-type: none"> <li>• Perkins Act Compliance</li> <li>• GEPA Compliance</li> <li>• Right to Privacy Act</li> <li>• User Confidence</li> </ul>
√	√	Reporting	USDoEd. SEA LEA	<ul style="list-style-type: none"> <li>• Annual Reports</li> <li>• NCES Special Reports</li> <li>• Special Reporting</li> <li>• Dynamic Search/Reporting</li> </ul>	<ul style="list-style-type: none"> <li>• Perkins Act Compliance</li> <li>• State Education Reporting</li> <li>• Local School Operations and Planning</li> <li>• Industry and Labor Planning</li> <li>• Public Information</li> <li>• Political Action</li> </ul>
	√	Alternative Data Collection	SEA	<ul style="list-style-type: none"> <li>• Special Needs Web Site</li> <li>• “Bubble” Scan Form Technology</li> <li>• Use Postal System</li> <li>• Telephone Interviewing</li> <li>• Personal Interviews</li> </ul>	<ul style="list-style-type: none"> <li>• Achieve High Response Rates</li> <li>• Inclusion of Individuals with no Web Access</li> <li>• Special Needs Participation</li> </ul>
√	√	Policymaker feedback	USDoEd	<ul style="list-style-type: none"> <li>• Timeliness</li> <li>• Quality Data</li> <li>• Representative Statistics</li> </ul>	<ul style="list-style-type: none"> <li>• Perkins Act Compliance</li> <li>• Program Planning</li> <li>• National Agenda</li> <li>• Legislative Action</li> </ul>

*Program Evaluation System Constructs and Functionality*

The database construct used in this systems model was relational because functional features are easier to decompose for analyzing the operation of the complete system. Relational database systems separate data into related types. Relationships are defined by data elements that are unique to either individual records or groups of records within each database. An indexing operation of the data elements in each discrete database determines these relationships. There is a performance compromise when the related databases have to index the data elements. The strategy is to have small relational databases, keeping data indexing to a minimum to achieve peak performance. Relational database structures offer the best change management configuration because when data elements are changed in a small relational database, then every database that has a relationship defined with it will be changed automatically. The desired characteristic is a fast responsive system composed of small, discrete but related databases.

Figure 2 shows the relational database structure of the conceptual program evaluation system. The system is called the Career and Technical Education Data Management System (CTEDMS). Eight databases form the CTEDMS. The relationships are defined by the CTEDMS located in the center of Figure 2. Internet web pages are used to access the databases by students, graduates, employers, school personnel, and the public (clients). Every transaction with the CTEDMS requiring controlled access must come through the Gatekeeper Access Control System (GACS). Data encryption is provided when others must not view the transaction. Server secure socket layer (SSL) technology is used to provide encrypted transactions between the CTEDMS and clients using web browsers. All of the databases have web page access capabilities. The databases with web page access shown are the ones that clients access to use the system.



*Figure 2.* Career and technical education data structures model. (relational database configuration)

In this research, relational databases were classified into two groups. The first group was called a support database. Support databases were designed to have few data elements and focus on one attribute of the system. An example would be the State Institution Database (SID) (see Fig. 3). Every student/graduate has a state institution affiliation. Students may change institutions or leave the state education system, or the state may add or remove institutions because localities are replacing or adding schools. When a student's institutional affiliation changes, the student records database is updated automatically because the relationship to the State Institution Database assures the correct affiliation. A more complex operation is accomplished

algorithmically when institutions are added or removed. The two-pass algorithm is executed only in the State Institution Database. A dual index is established using the institution name and institution code. The first pass consists of changing the institution name based on ZIP Code or Telephone Prefix Code, for example, then on the second pass the institution code is changed based on the institution name assigned to the individual students. Students affiliated with the effected institutions are automatically re-assigned to their new institutions. Any change to the support database must be thoroughly considered before making any modifications.

The second database type in the relational system structure was called primary. Primary databases are large and used to collect data from the sample groups. They also can be the analysis and/or reporting databases. In performing either the analysis or reporting functions, the record lengths can become large. Distribution of tasks between the primary database systems is the best method to manage many records with large record lengths. The database engines that drive analysis and reporting systems must have higher processing performance. Higher processing performance comes with reduced functions such as form development used in building the human interfaces with the system. The desired outcome is to rapidly transfer processed data from the high-performance primary processors so clients can access data in a timely manner.

An additional reporting method using the primary databases is to produce electronic paper documents at predetermined intervals that are either time-based or activity-based. The electronic paper reports are stored in a repository database. Users access the forms for reading and/or downloading using an interface to the repository database. Electronic paper reports can be done

on the fly or as fixed-format reports stored once. On-the-fly electronic paper reports should be small reports requiring lower data analysis and form processing times.

Table 11 elaborates on the functions and relationships of the databases that comprise the CTEDMS relational database system. The “Database Size” column is a relative indication of records capacity compared with other databases in the CTEDMS. Small databases are support databases and used to store and manage single operations within the system. The only exception is the Courses and Curricula Database (CCD). A series of crosswalks would have to be constructed by school districts to coordinate similar courses and programs if the state does not have a uniform coding system. U.S. Department of Education (2003a) Classification of Instructional Programs (CIP) is a good example of a unified taxonomic coding system. Data codification constraints must be considered early in the program evaluation design process. The “Function” column in Table 11 describes the type and function of the CTEDMS databases. Support database are the types identified. The “Relationships” column identifies the databases that have data elements related to the database listed in the “Database Name” column.

When a data collection cycle is complete due to a time-based event or an activity sequence, the database has to be prepared for the next cycle. The operation to prepare the database is called “rollover.” “Rollover” (see Table 11) is when the database is frozen, either being archived in the state at the close of a process cycle, or archived and cleared to start another process cycle.

As an alternative to relational database systems design, monolithic database designs are useful. Monolithic database constructs are systems that place all data related to a single indexed element into a large database (see Figure 3). The database engines have to be extremely fast to build and access a monolithic system. In the case of the secondary CTE evaluation system,

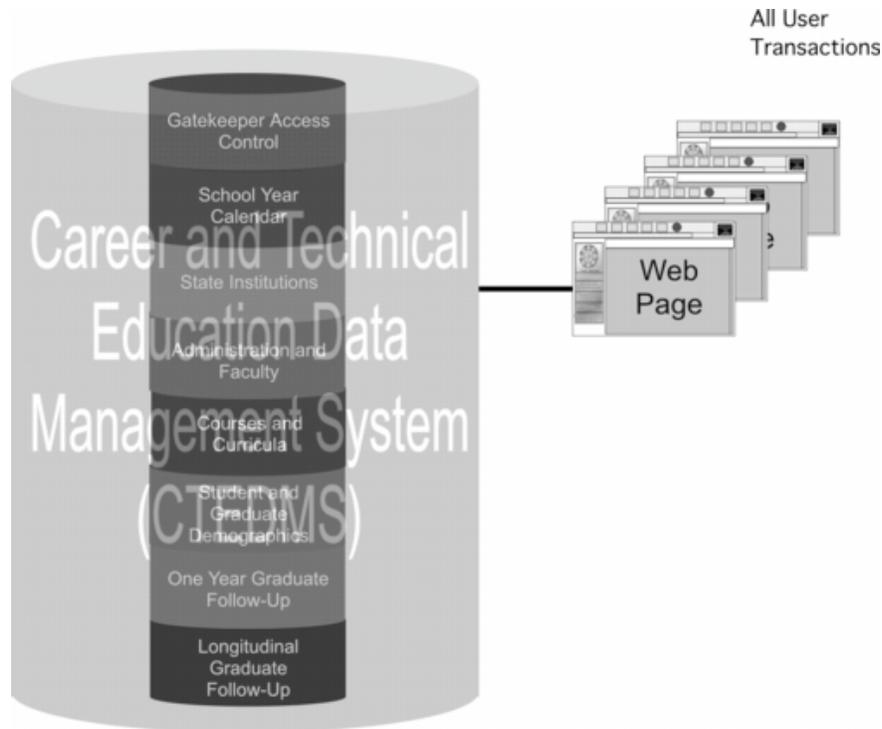
Table 11

*Functions and Relationships of CTEDMS Databases*

Database Name	Database Size	Function	Relationships	Rollover
Gatekeeper Access Control System (GACS)	Small	Support Database  Access Control and Data Security	School Year Calendar Database (SYCD)  Student and Graduate Demographics (SGD)  Administrators and Faculty Database (AFD)	Never, continuously updated by records in the related databases
Student and Graduate Demographics (SGD)	Large	Data Collection and Reporting Sub-System  Student Name, Student ID, CTEDMS System ID, password, institution, contact information, CTE program, graduation year, completer or participant, electronic and paper correspondence	School Year Calendar Database (SYCD)  State Institutions Database (SID)  Courses and Curricula Database (CCD)	Annually, at the close of the school year and automatically based on School Year Calendar Database (SYCD). All records removed are archived by school year and institution.
School Year Calendar Database (SYCD)	Small	Support Database  System date and timekeeper, based on school year (SY) and also keeps calendar year. Is the key for automatic time based data management, collection, analysis, and reporting functions	All other databases in system	Continuous, based on the system sever time and date
Courses and Curricula Database (CCD)	Large, if not standardized by the state.  Moderate to small, when course codes are standardized based on content but not necessarily course name.  Small, if completely standardized by the state	Support Database  Course and curricula coding and composition	School Year Calendar Database (SYCD) and State Institution Database (SID) if <u>not</u> standardized courses and curricula  School Year Calendar Database (SYCD), if completely standardized by the state	Annually, at the close of the school year (SY). Revised by state personnel and/or institutions. All records removed are archived by school year and institution.

Table 11 (cont.)

Database Name	Database Size	Function	Relationships	Rollover
Administrators and Faculty Database (AFD)	Small	Support Database  Includes contact information, institution affiliation and passwords is populated with: <ul style="list-style-type: none"> <li>• state CTE office personnel</li> <li>• division CTE directors</li> <li>• school CTE coordinators</li> <li>• designated personnel from state, division and school levels</li> </ul>	School Year Calendar Database (SYCD) and State Institutions Database (SID) if state standardized courses and curricula  School Year Calendar Database (SYCD), Courses and Curricula Database (CCD), and State Institution Database (SID) if <u>not</u> state standardized courses and curricula	Annually, at the close of the school year. Revised by state personnel and/or institutions. All records removed are archived by school year and institution.
State Institutions Database (SID)	Small	Support Database  All public, private and corrections institutions offering secondary CTE programs.  Public and private post-secondary institutions	School Year Calendar Database (SYCD)	Annually, at the close of the school year. Revised by state personnel and/or institutions. All records removed are archived by school year and institution.
One Year Graduate Follow-Up Database (OYGFD)	Large	Data Collection and Reporting Sub-System	School Year Calendar Database (SYCD)  Student and Graduate Demographics (SGD)	Annually, at the close of the school year. Verified by state personnel and/or institutions. All records removed are archived by school year and institution.
Longitudinal Graduate Follow-Up Database (LGFD)	Large	Data Collection and Reporting Sub-System	School Year Calendar Database (SYCD)  Student and Graduate Demographics (SGD)  One Year Graduate Follow-Up Database (OYGFD)	Annually, at the close of the school year. Verified by state personnel and/or institutions. All records removed are archived by school year and institution.



*Figure 3.* Monolithic database structure.

everything in a record would be referenced to the individual student. Any database transaction would change the student/graduate record. All of the record fields would be populated when the student/graduate had completed the entire program evaluation process. The monolithic database design was shown as an alternative to relational database designs. It must be remembered that the conceptual program evaluation system model could have many possible configurations.

#### *CTEDMS Flowchart*

This section developed the conceptual system model (second output parameter – see Table 2) for a state-administered program evaluation system. It was a synthesis of the input parameters in

Table 1 and the requirements output parameter in Table 2. It complies with the requirements of the Perkins Act and the theory-based strategies developed in Chapter III for program evaluation systems that support state and local CTE programs. System model flowcharts are located in Appendices C through J. A process flowcharting technique was used to show how the system works. Describing a system using flowcharting conveys the logical operation of the system.

Appendix C describes the conventions used in constructing the process flowcharts. The symbology used is a variation of the standardized American National Standards Institute (ANSI) system flowcharting conventions. This was done to assist the reader by using as few process symbols as possible while still indicating the process parameters and operations.

Included in the process flow are representations of the technologies used in the system. The delivery system used in the model is the Internet. There are additional references to alternative delivery systems, such as the use of bubble scan form technology. When alternative or parallel delivery systems are used in the model, they are positioned in the process flow at the point of their use. Alternative processes are not expanded upon in the process flow because they are used in parallel with the Internet-delivered processes. The process logic is the same or similar for alternative delivery technologies. Expanding their sub-processes would add complexity to the system model, detracting from the conceptual model's intent.

Notes and system display layouts are included on every flowchart page. The display layout is what the system user (client) would see on the computer while participating in the program evaluation process. The notes on the flowchart pages provide details to the process characteristics. Notes articulate fine operations or conventions used that are not readily apparent to the reader.

Web site addressing schema is shown in each process block. The addressing structure conforms to Hyper Text Transport Protocol (http) conventions. The file structure containing the web page files has a root directory named [ctedms/]. The full web site root directory address is [http://ctedms/]. Table 12 describes the system activities and links by identifying the functions and relationships to Perkins III policy-based system requirements.

The program evaluation system is depicted in Appendix D. It is composed of six activities and three support links. Flowchart D1 represents the composition and process flow of the program evaluation web site. All six activities are detailed, showing their contribution to the program evaluation process. Strategies used in developing the activities are elaborated upon to establish the relationships to the Perkins Act and program evaluation system requirements of SEAs and LEAs.

Flowcharts D3 through D8 (see Appendix D) are examples of the web site navigation available for each of the activities. Resource links are also located on the home page to increase the utility of the web site for the client audience. Special needs participants would have an alternative web site designed with larger text, higher visual contrast, and multi-media to present the program evaluation activities. Additionally, individuals with special needs are offered alternative delivery options that include telephone interviews and mailed bubble forms. The “Students and Graduates” and “Program Contacts and Assistance” web page buttons (see Appendix D - flowchart D2) are where requests can be made for alternative delivery options.

The home page (Appendix D - flowcharts D2 – D7) is the only web page in the system that uses one frame. All other system web pages use a three-frame display layout. The three-frame display layout is pictured in D8. The top frame (Activity Frame) always indicates the system

Table 12

*Functions of the Program Evaluation System Activities and Links*

Activity/Link	Function and Policy Compliance
Introduction Appendix E <a href="http://ctedms/intro/">http://ctedms/intro/</a>	Self-paced or instructor presented introduction to the state career and technical education follow-up process. Designed for school faculty, staff, students/participants, parents, and employers. Multi-media components are used to enhance the presentation and for special needs assistance.
Division and School Personnel Appendix F <a href="http://ctedms/divsch/">http://ctedms/divsch/</a>	The activities performed here are student demographic records reviewing, editing, and status reporting. All of these activities are restricted access, limited to designated division and school personnel. The designation of personnel is controlled by the Division Directors and School Program Coordinators. Builds a student records system that be derived from the school records system(s).
Student and Graduates Appendix G <a href="http://ctedms/stugrad/">http://ctedms/stugrad/</a>	<p>Complies with: Perkins Act: Section 5 – Privacy General Education Protection Act (GEPA) Right to Privacy Act Americans with Disabilities Act (ADA)</p> <p>Demographics data collection during and at the completion of high school. Includes program completers and participants. Also collects state standardized test scores and the results of vocational/technical skill evaluations. Updated at the one- and five-year follow-up activities. Used to characterize the response group in compliance with the Perkins Act core indicators 1, 2 and 4.</p> <p>One-year follow-up data collection of program completers and participants evaluation of their employment status and satisfaction, skills attainment and application, pursuit of additional education, quality of high school education, and employer contact information (optional). Satisfies Perkins Act core indicators 3 and 4.</p> <p>Five-year follow-up data collection of program completers and participants evaluation of their employment status and satisfaction, skills attainment and application, pursuit of additional education, quality of high school education/postsecondary education, and employer contact information (optional). Captures the post-secondary education group, longer-term employment group, and employer evaluation of vocational/technical education contributions. Satisfies Perkins Act core indicators 3 and 4.</p> <p>The aggregated data from the three data collections will contribute to the Perkins Act requirements for program accountability (Sec. 113 – State Adjusted Levels of Performance) and Perkins Act: Section 114 – National Activities. Additional state policy, economic development, and school operations feedback could be derived from this data.</p> <p>Complies with: Perkins Act: Section 5 – Privacy General Education Protection Act (GEPA) Right to Privacy Act Americans with Disabilities Act (ADA)</p>

Table 12 (cont.)

Activity/Link	Function and Policy Compliance
Reports Appendix H <a href="http://ctedms/rep/">http://ctedms/rep/</a>	<p>Reporting of aggregated demographics and student/graduate academic and vocational performance and accomplishment. Data complies with Perkins Act: Section 114 – National Activities characterizing the data that conforms to the core indicator measurements.</p> <p>Reporting products can be improved using an integrated system that can compare and contrast data from other sources. Regional and local reports can be produced to support economic development and school planning at the secondary, postsecondary and higher education institutions. Reports can be generated dynamically based on inquiry parameters constrained not allowing “beauty contests” of competing organizations. Timely and targeted feedback provided by the system offering additional utility to state policymakers.</p> <p>Complies with:            Perkins Act: Section 5 – Privacy            General Education Protection Act (GEPA)            Right to Privacy Act            Americans with Disabilities Act (ADA)</p>
Program Contacts and Assistance Appendix I <a href="http://ctedms/cont/">http://ctedms/cont/</a>	<p>System utility that provides information about the organization of the state program evaluation and people to contact within the organization.</p>
Employers Appendix J <a href="http://ctedms/emp/">http://ctedms/emp/</a>	<p>One-year follow-up data collection of employer occupational skills evaluations of the program completers and participants (if permission is granted by the one-year follow-up respondent). Satisfies Perkins Act core indicators 3 and 4.</p> <p>Five-year follow-up data collection of program completers and participants, and their employers (if permission is granted by the participant). Captures the post-secondary education group and longer-term employment and employer career education contributions. Satisfies Perkins Act core indicators 3 and 4.</p> <p>The aggregated data from the three data collections will contribute to the Perkins Act requirements for program accountability (Sec. 113 – State Adjusted Levels of Performance) and Perkins Act: Section 114 – National Activities. Additional state policy, economic development, and school operations feedback could be derived from this data.</p> <p>Complies with:            Perkins Act: Section 5 – Privacy            General Education Protection Act (GEPA)            Right to Privacy Act            Americans with Disabilities Act (ADA)</p>
State Dept. of Education Link Appendix I	<p>Web site links to the state education agency resources and personnel.</p>
Technical Support Link Appendix I	<p>Presents the ways to contact technical support. Displays the following:</p> <ul style="list-style-type: none"> <li>• Hours of operation</li> <li>• System status information (outages, slowdowns, maintenance, etc.)</li> <li>• Frequently Asked Questions (FAQ) database</li> <li>• What type of questions will be answered.</li> <li>• Methods of contact:               <ul style="list-style-type: none"> <li>- E-mail (preferred because of automatic logging)</li> <li>- Toll free telephone number</li> <li>- Postal service address</li> </ul> </li> </ul>
Important Research Links Appendix D	<p>Web site links to other agencies and extant resources.</p>

activity that the client is doing. It changes only when the activity changes. Primary and secondary activity levels are displayed in this area when additional levels complement the task context.

The left side frame is oriented vertically and occupies not more than 20% of the display width. This area is reserved for web site navigation and instructions. Web site navigation allows the client to move from activity to activity. The client's ability to navigate is curtailed when entering, searching, or editing data. In some cases, to keep the client on task it is necessary to only have instructions for the activity in this frame. Navigation components are introduced in the Instructions and Navigation frame as the client completes activities.

The Activity Content frame is the largest area in the display layout. This is the most dynamic display area. All of the activities of the system are located here. The client interacts with the system performing specific activities including data entry, records sorting/searching, editing, and system status reporting in this area of the display.

### *Preparation for the Program Evaluation Process*

To satisfy the four performance core indicators in Section 113, the Perkins Act requires a large amount of data to be collected. Accomplishing this will require the SEA to have available a system that prepares the schools and students to participate in the program evaluation process. These flowcharts are located in Appendix E. The population of the program evaluation consists of students (including drop-outs) and high school graduates who participated in or completed career and technical programs. This preparation must be done before the end of the federally defined school year. The federal government defines the school year as August 1 through July 31

of the following calendar year. Most students will graduate in May or early June. Students who graduate at the end of summer school will participate in the preparation and data collection activities prior to the end of the spring session. If there are any changes in graduation or program completion status during the summer session, the school CTE Coordinator or his/her designee will have to amend the students' records in the system.

The Introduction (Appendix E) sub-system can be used by the LEAs in an instructor-guided format to prepare students, faculty, and staff for the program evaluation process. It is also designed to be used by the same groups in a self-paced independent instruction format. The sub-system is broken down into seven activities to introduce the program evaluation process and the resources available to the various groups using the system. It is important to present the program evaluation process and the purposes it serves. Addressing the way the data are used and not traceable to an individual during the analysis and reporting phases of the process complies with both the Perkins III and General Education Provisions Acts (United States Congress, 1984). The data handling and security issues are specifically addressed in the process flowchart E4 (Appendix E). If the school exudes confidence and can demonstrate it through the use of the Introduction sub-system, students will be more accepting of the follow-up activities. It is very important to convey to the respondents that participation is important and that their responses and personal information will be handled with care with the ultimate goal of improving the state CTE system. The introduction activities must be done well to get the response rates necessary to meet the core indicator requirements of the Perkins Act. The policy has targeted demographic areas of interest. Rural areas are specifically identified in Section 112 of the Act. These areas will have to get a high response rate to achieve representative data.

*Data Collection*

*Demographics.* The demographics data collection, analysis, and reporting (Appendix G – Flowcharts G1-G4) is the most critical component of this system concept. It is the foundation that assures the program evaluation process produces valid and reliable data. All of the student/graduate follow-up activities are based upon this foundation. A large portion of the federal reporting requirements can be satisfied with demographics data. It will provide a composite of the current school year CTE student characteristics in the state and localities. State, regional, and local vocational and secondary technical education enrollment patterns could be analyzed. Perkins III specified special populations, non-traditional students, and Tech Prep program participants' characteristics can be determined from the demographics data.

Students supplying demographic data are graduating seniors who completed a vocational program, seniors who took vocational classes but never completed a program, and students who took CTE classes during the school year. The system algorithmically determines if a student is a participant or program completer by analyzing their vocational courses completed. To be a program completer, the student must have completed the courses required in a specified vocational program and passed the academic and vocational skills assessments for that program to satisfy the Perkins III requirements. CTE participants are students who do not complete specified vocational programs but have taken vocational classes. High school graduation is not a condition for being a CTE program completer. An example of this would be a student who receives certification by the American Welding Society (AWS) as a welder after taking welding in high school but never graduates. This example satisfies the criteria for the Perkins Act core

indicator two that states “attainment of a secondary diploma or equivalency, skill certificate, or postsecondary degree or credential.”

Appendix G (G1–G4) is the process flowchart for the student-supplied demographics data collection. The data elements are identified in the flowcharts. Individual student data are collected at low levels of aggregation. This is done so the CTEDMS can be used to extract information based on discrete characteristics of the response group.

The student demographics process begins with a welcome page (see Appendix G - flowchart G1). The welcome page provides the respondent with an explanation of the demographics collection process, usage instructions, e-mail requirements, and transaction security information.

E-mail is very important in the program evaluation process. It is used to make contact with the student/graduate when the one-year and five-year follow-ups are conducted. The web site must have links to e-mail service providers. Internet Message Access Protocol (IMAP) e-mail accounts are preferred over Post Office Protocol (POP) accounts because the owner can access them from any system in any location. This makes it convenient for students and graduates entering one of the most mobile periods of their lives to correspond using a consistent e-mail address. This reduces mailing costs and automates the follow-up e-mailing via a demographics database-generated list server.

Appendix G – flowchart G2 shows the process for entering into the demographic data collection web pages. E-mail addresses are validated by checking for at least seven characters and one of the characters is an “@” in the e-mail address string. An invalid e-mail will result in an error page display. The student can elect to re-enter his or her e-mail address, continue without entering an e-mail address, or quit and return to the home page. If the student does not

want to provide an e-mail address, he or she can continue with the demographics data collection. They will be contacted by mail the following year to participate in the one-year follow-up.

Flowchart G2 shows the content of the student demographic record. The information consists of contact information, demographics, school, special needs, and Social Security Number entries. Three issues come into play when collecting demographic information. The first is ethnicity. Ethnicity is an individual's cultural identification, not just race. Offspring of multi-racial relationships may identify with both cultures. Ethnic diversity may be better measured if the student is asked the ethnicity of their parents. The reporting of ethnic group data would have an additional group called "multi-cultural," indicating that the students have parents from different ethnic groups. Standardizing ethnicity categories and definitions with the U.S. Census would provide better comparative data.

This program evaluation system model does comply with the U.S. Office of Vocational and Adult Education policy memoranda (Appendix K and L) regarding security of personal information and the use of Social Security Numbers (SSN). The Perkins Act in Section 5 states that a national database cannot be created that can identify individuals deriving services from this legislation. This places the use of the SSN at the state level. States are going to have to use the SSN to acquire the data to comply with the program performance core indicators. The Florida Education and Training Placement Information Program (FETPIP) is an example of a State system that has effectively used SSN identification for educational program evaluations (Ramirez & Swanson, 1991). The Perkins III core indicators have both immediate and long-term measurements of program performance. This requires that individuals be contacted at multiple intervals after leaving the secondary education system. To comply with the Perkins Act and

Social Security Administration regulations, the student is asked to provide the SSN, told how it is to be used, and the security provisions in place to protect identities. The student can elect to provide it or not.

A selection question is posed to the student on the demographics data collection web pages that ask the student to identify his or her occupational objective. This question is to measure completed vocational program/courses in relation to an occupational objective. A student may be using CTE courses to augment academic coursework to satisfy an occupational interest. This may indicate that career guidance and/or exposure through cooperative education, job shadowing, or some other career experience could have been useful. This question specifically meets the requirement of the Perkins Act to improve performance of CTE programs by indicating if the program offerings are meeting the students' needs.

The student demographics web page form is validated by the CTEDMS. If data are missing, the form is returned to the student for completion (see Appendix G - flowcharts G2-G4). When the form is validated (complete), the student cannot access it again. This is done to avoid answer reconsideration based on reflection or peer influences. The student is thanked for participating in the program evaluation (see flowchart G4). Besides expressing appreciation, the closing web page emphasizes the importance of participation in providing feedback that improves the quality of CTE in the state.

The school completes the demographics data collection process by reviewing the student records. This review process is shown in Appendix F – flowcharts F4 and F5. School and division personnel, designated by the school CTE Coordinator and the division CTE Director respectively, can search the demographics database and view or edit student records. Editing

records requires a different access authorization than does read-only access. The school validates the student-supplied information.

An alternative to having students supply information is to use the division or school student records system. Downloading student data requires that the information is current and matches the data collection requirements of the CTEDMS. This level of systems integration requires coordination between the SEA and the LEAs. The coordination efforts between the SEA and the LEAs may offer some important benefits to both groups. First, development of uniform data codification that satisfies federal and state program requirements. Second, an integrated system makes information available to both education agencies that will better serve their organizational needs and clientele. Distribution of the program evaluation tasks using advanced technology may make the process more palatable from operational and transaction cost perspectives. The result may be that organizations are “willing” to make the process work and find it appealing because their level of participation is within the resources available to them. LEAs may also derive operational and technological benefits that will further enhance their “ability” to participate in the program evaluation process.

School or division personnel will have to supply additional student demographics data. State recognized academic and vocational skills assessment results must be entered to comply with the Perkins Act core indicator requirements and state education policies. The localities must identify all of the graduating students. The school must determine some special populations membership because uniform definitions of membership must be imposed to comply with federal policies. The school or division personnel verify student program enrollment in Tech Prep, cooperative education, and other programs that complement CTE.

The process flowcharts in Appendix F represent the program evaluation system functions available to school divisions and local schools. Each of these organizations has access security control through the Gatekeeper Access Control System of the CTEDMS. They are responsible for designating the personnel in their organizations that can perform database record viewing and editing operations.

*Student/graduate one-year follow-up.* This data collection component of the program evaluation process occurs one year after graduation of a class (see Appendix G – Flowcharts G1 & G5-G13). A one-year interval was selected for two reasons. First, the Perkins Act has an initial (this is qualified later in the longitudinal follow-up section) five-year life cycle. This would limit the one-year data collection to four intervals from the date of enacting the legislation. Second, this period lets the students/graduates establish themselves in an activity or experience multiple activities consisting of the military, work, family, education, or unemployment.

E-mail is the first contact method employed. E-mail addresses are stored in the Student and Graduate Demographics (SGD) database (see Table 11). The students/graduates in the graduation year cohort (see Definition of Terms) that receive e-mail are congratulated for their high school graduation (if this condition applies) and reminded of their participation in CTE. School logos and e-mails sent by the school board or principal add legitimacy and importance to participating in the follow-up. The e-mail has a brief explanation of the follow-up intent and a recapitulation about the introduction and demographics data collection activities they participated in the year before. An identification number (password) unique to that person is on the e-mail with a hyperlinked address to the follow-up survey web site. Contact information is

included using e-mail, a toll-free telephone number, or a postal address to make any inquiries or to request alternative follow-up survey materials. Alternative survey materials are for individuals with special needs or those that want to use paper forms or telephone interviews. E-mails should include an apology if the e-mail was addressed to the wrong person as an expression of goodwill. Additionally, the schools may want to consider having a raffle for season tickets to school sporting events or prizes for participating. This is a good way to promote alumni relations. The point is to get the best response rate possible, and incentives may assist in doing that. E-mail returned with bad addresses are removed from the list server. A second e-mail notice is sent to the non-responding group one week after the first notice.

Mail postcards with the same information during the second week to the individuals with bad or no e-mail addresses. The unique identification number (password) and the web site address are on the postcards. A third e-mail notice may be necessary, especially if the response rate is low in areas having a large percentage of CTE students in small school systems. This would include small schools served by regional CTE centers.

In the fourth week and excluding all non-deliverable postcards, a second and final mailing is done. The costs associated with mailing and processing the paper documents are much higher than using a paperless approach as the primary contact method.

The final course of action occurs in the fourth week. Schools do telephone interviews with the students/graduates. Personnel from the schools or divisions call and complete the web-based survey forms over the phone. The upside is that schools can establish contact with past students and promote alumni relations. Some schools may want to do telephone interviews because it would serve additional purposes. A positive for the follow-up program administration is that this

is an annual activity, and a renewed interest in doing a better job introducing and promoting the follow-up before graduation may become apparent. The downside is that this can become an encumbrance to the schools and divisions. The “willingness” factor may decay if the school feels it is not getting the appropriate assistance from the SEA and if the school does not perform well, resulting in punitive action taken by the state based on the requirements of the Perkins Act.

Divisions and schools with poor response rates, especially over a number of continuous iterations, will have to be confronted and actions taken. The SEA under Section 123 must produce a state improvement plan if performance levels are not achieved. The consequences include state sanctions for lower-than-expected performance or non-performance. The SEA does have an identified leadership role under Section 124 and must exercise it to achieve state performance goals submitted in the state plan to the federal government.

The one-year follow-up survey instrument can be administered in a number of ways. The use of the Internet is the preferred method of delivery because the instrument can be configured based on the responses of the individual. Two web sites are offered to the participating students/graduates. One serves the special needs segment of the responding group. This web site conforms to visual and audio requirements of web sites for people with disabilities.

Individual respondents can use the Internet-delivered instrument without supervision. It provides the necessary instructions and web site navigation aids that facilitate proper use of the instrument. If problems are encountered, support resources can be accessed during the response process and then return the respondent to the instrument. Schools can use the web-based delivery system to conduct interviews over the phone or in person. They can also use bubble scan forms to administer the survey. The bubble scan form delivery method should be discouraged for use

by schools because data entry errors and form handling problems will be encountered. Bubble scan forms should be mailed with appropriate instructions to students with special needs and those who have no access to the Internet or do not want to use the Internet. See Table 13 for the areas of inquiry the follow-up instrumentation includes.

Appendix G is the Student and Graduate sub-system of the CTEDMS. Flowchart G1 begins the one-year follow-up process. From this flowchart, the process continues in flowcharts G5 through G13. The Gatekeeper Access Control System (see Figure 2 and Table 11) verifies the identification of the respondent using the password sent to the student/graduate via e-mail or postcard. If the respondent has the wrong password or has already completed a survey, an error page is displayed informing the respondent of the possible error conditions. The respondent acknowledges the error page by clicking the “Continue” button or returning to the site home page using the left frame navigation bar. The error page also has technical support contact information and links to get assistance. All of the one-year follow-up transactions are done using a secure web site. This is not necessary after Gatekeeper has let the individual enter but it does instill confidence that respondents’ answers are private.

Once the respondent is approved for entry, he or she is presented with two screening questions. Screening questions determine how the follow-up survey will be presented to the respondent. The instrument automatically configures the questions that will be asked. The first screening question is about the employment status (see Appendix G – flowchart G5). The respondent selects one of the responses that indicates current employment status. The second screening question is a yes/no response to an inquiry about if the respondent has enrolled in

Table 13

*One-Year Follow-up Areas of Inquiry*

Areas of Inquiry	Inquiry Items (see Appendix G)	Purpose
Employment Status	<ul style="list-style-type: none"> <li>• Full-time/Part-time/Unemployed (G5 &amp; G6)</li> <li>• Knowledge and Skills (G7)</li> <li>• Length of Employment (G7)</li> <li>• Current Salary or Wage (G7)</li> <li>• Career Development Related to CTE Program (G7)</li> <li>• Reason for Unemployment (G7)</li> <li>• Certification or Licensure (G7)</li> </ul>	Characterizes the individual's employment status with respect to the CTE program participated in or completed. Unemployment conditions are also characterized in the one-year follow-up. Satisfies the Perkins Act core indicators 3 and 4 (see Appendix A).
Job Satisfaction	<ul style="list-style-type: none"> <li>• Current job only or most important job if individual has multiple jobs</li> <li>• Satisfaction with the following (G8): <ul style="list-style-type: none"> <li>- salary/wages</li> <li>- supervision</li> <li>- co-workers</li> <li>- advancement potential</li> <li>- employer expectations</li> <li>- work assignments</li> <li>- responsibility</li> <li>- job security</li> <li>- benefits</li> <li>- company policies and practices</li> <li>- organized labor representation (if member)</li> <li>- overall working conditions</li> </ul> </li> </ul>	Determine the aspects of the job that enhance, detract, or have little influence on the work experience. Used as an indicator of how well CTE prepares people for work. Assessment of program performance.
Employer Information and Contact Permission	<ul style="list-style-type: none"> <li>• See Appendix J for Employer Inquiry Items</li> <li>• Student/Graduates must give permission to contact employer (G9)</li> <li>• Supply employer contact information (G9)</li> </ul>	To get employers feedback regarding the preparation for work of CTE students as compared to entry level employees without it. Satisfies the Perkins Act core indicator 3 (see Appendix A).
Skills Attainment	<ul style="list-style-type: none"> <li>• Academic skills rating (G10)</li> <li>• Vocational skills rating (G10)</li> <li>• Work related behavioral skills rating (G10)</li> <li>• Employers are asked to rank the same set of skills (see Appendix J)</li> </ul>	Skill rating of how well the high school courses/program prepared the individual for work and/or additional education. Satisfies the Perkins Act core indicators 1, 3 and 4 (see Appendix A).
Education Status	<ul style="list-style-type: none"> <li>• Current enrollment in postsecondary, higher education, apprenticeship, training program or the military (G11)</li> <li>• Past enrollment in postsecondary, higher education, apprenticeship, training program or the military (G11)</li> <li>• Instruction delivery formats experienced (G11)</li> </ul>	Determination if CTE built foundations for pursuing additional education. See if respondents are pursuing education or training program that complement their CTE or are changing career interests. Assess what instructional delivery systems are used and feed this back to vocational programs and schools. Satisfies the Perkins Act core indicators 2, 3 and 4 (see Appendix A).
Quality of High School Education	<ul style="list-style-type: none"> <li>• Rate the following aspects of the high school education experience (see G12): <ul style="list-style-type: none"> <li>- facilities</li> <li>- equipment</li> <li>- computer technology</li> <li>- courses</li> <li>- instruction</li> <li>- organizations</li> <li>- academic advisement</li> <li>- encouragement</li> <li>- academic standards</li> <li>- career exploration and counseling</li> </ul> </li> </ul>	Evaluate the aspects of the respondents' high school education experience. Identification of the things that contribute positively and negatively to the experience. Use for feedback to the divisions and schools so they can assess their performance. SEA can use this analysis to modify state plan and adjust state performance levels as per the requirements of the Perkins Act – Sections 122 & 123.

education or training program since leaving high school. These two questions set-up the instrument branching that will ask only questions germane to employment and education situations. The responses are validated by the system for completeness. If either question is not answered, an error page is displayed explaining the problem. The respondent can return to the original questions page or leave the follow-up with the option of completing the follow-up at another time.

Full-time (G6) and part-time (G7) employment instrument sections have similar questions regarding the type, duration, and skills used on the job. Full-time and part-time employment determinations are based on Department of Labor definitions and directly support the Perkins III and WIA integration requirements. Part-time employees must respond about the job that is most important to them if they are working more than one part-time job. Job importance is a term they define when responding to the employment questions.

The question regarding the employment relatedness to career development and their vocational program assists in addressing the Perkins Act performance core indicators. The federal government is interested in knowing if vocational program completers and participants find employment related to their career interests and if the career is non-traditional.

Flowchart G8 shows the Job Satisfaction inquiry process (see Table 13). Both full-time and part-time employed individuals are asked these questions. There is one exception, however. Homemakers are non-compensated, full-time occupations and cannot be asked full-time employment questions because their situation is not considered as full-time employment. The system will not present Homemakers with these questions as shown in the process flowchart G6.

When full- and part-time employed respondents are finished answering the job satisfaction questions, the system validates their responses (see flowchart G8). If any question is not answered, an error page is displayed. The respondent acknowledges the error page and is returned to the job satisfaction web page. If the respondent does not want to answer one or some questions, then after one validation pass they are allowed to proceed with the follow-up.

Full-time and part-time employed respondents are then asked to supply contact information for their employers (see flowchart G9). This is an elective portion of the follow-up process. The introductory section of the web page explains the need for employer participation to help improve CTE. From employer feedback, local and state education and training programs can identify strengths and weaknesses in the programs offered. This satisfies the Perkins Act requirements in Sections 121, 122, and 123 regarding state leadership, planning, and program administration.

Respondents supply employer contact information first and then give explicit approval to contact their employers. This is done so that if their employer inquires, it can be verified that the student/graduate gave permission for contact.

Unemployed individuals are asked a different battery of questions. Flowchart G7 depicts the process flow for unemployment inquiries. Unemployment responses are “unemployed since graduation” or “currently unemployed, but have been employed since graduation”. Reasons for unemployment response options are “lacking skills or opportunities”, “pursuing additional education”, “entry into the military”, or “not desiring employment”. Obtaining or working on certification or licensing is the last question in the unemployment status section. The responses

are validated and returned if a response is left blank. The response validation only occurs once and then allows the respondent to continue.

Flowchart G10 merges the employed, Homemakers, and unemployed back into a single process flow. This follow-up section deals with skills attainment with respect to their high school education preparing them for work and/or additional education. To be presented these questions the Homemakers or unemployed individuals must be pursuing additional education. The respondents rate academic, vocational, and work-related behavioral skills. This line of inquiry specifically addresses the measurement requirements in the Perkins Act core indicators 1, 3 and 4. The skills attainment data combined with demographic, employment, and education status data can be used to detail the state's response to these three core indicators and provide an important analysis of the programs being offered at the local levels.

The last two sections of the one-year follow-up instrument look at educational pursuits since leaving high school and the quality of the respondent's high school education. Flowchart G11 represents the current educational status inquiry. These questions are presented only to the respondents who acknowledged they had pursued additional education or training since high school in the initial screening question of the instrument. The employed, unemployed, and Homemakers can respond to the educational status questions. Questions are divided into three inquiry groups. The first inquiry group consists of questions related to the individual's current educational or training activities. The second inquiry group has the same questions but focuses on previous educational or training activities. This captures the individuals who have partaken in education or training since high school but are not currently active.

The last inquiry question in the educational status area (see Table 13) concentrates on the instructional delivery systems respondents were exposed to while pursuing additional education or training. A number of federal and state-sponsored programs are very interested in the incorporation of technology into education. The Perkins Act and other activities like the Teacher Quality Enhancement (TQE) grant program have components that specifically identify the infusion of state-of-the-art technology into teaching and learning. The National Center for Education Statistics (NCES) incorporates this measurement into national studies for secondary and postsecondary education.

Quality of high school education is the last inquiry area on the instrument (see Table 12 & flowchart G12). Every respondent is asked these questions. Aspects of the high school experience are rated using a Likert scale construction. The purpose is to gather information on the strengths and weaknesses at the school, local, regional, and state levels. The Perkins Act requirements are served by providing data for planning and program administration. School and regional interests can use these data for planning and economic development purposes.

The one-year follow-up concludes by asking the respondents for their preferred e-mail address (see flowchart G12). Additional information such the ZIP Code where they reside could be of assistance if an analysis of students/graduates' dispersion after completing high school is of interest. It may be of value in locating individuals for the five-year follow-up. The system could also ask them for their SSN if the system does not have it. The current home address may be useful. The point is to prepare for the five-year follow-up, yet do not lose the respondents' interest in participating by probing too deeply. Thank them for participating and acknowledge their entry in any raffles or present them with a gift for participating at this point.

Appendix J is the Employer follow-up sub-system. Flowchart J1 is where employers can access the program evaluation system. Program evaluation introductory information and terminology are available to assist participating employers in understanding the purpose of the follow-up activities. They are also invited to use the reports available for business planning.

The one-year employer follow-up is depicted on flowchart J2. The employer follow-up is access controlled through the Gatekeeper Access Control System. Employers are e-mailed or mailed postcards with a password to gain access to the follow-up instrument. The password establishes the relationship between the employer responses and student/graduate record in the CTEDMS. The employer survey is short and asks the employer to compare the occupational preparedness of the student/graduate to employees who had not participated in CTE programs or who had comparable secondary CTE as entry-level employees. When the survey is complete, the employers are thanked for their participation in the improvement of state and local secondary CTE programs.

*Student/graduate longitudinal follow-up.* The longitudinal follow-up was incorporated into the conceptual system model to address the transition, placement, and retention aspects of the Perkins Act performance core indicators (see Appendix G1 & G14-G22). Individuals who pursue additional education beyond one-year after graduation and those individuals who change careers (including military) early in their adult lives are completely missed in the one-year follow-up because their transitions to other activities are not captured. This seems counter to the intentions of the Perkins Act.

Alternative processes can be used to accomplish portions of the core indicators transition measurements, but questions regarding why the transition occurred and the contributory aspects of their secondary CTE participation would be lost in such static data merging. The researcher appreciates the post-hoc data analysis possibilities of well-designed summative program evaluations developed by federal and state agencies as advocated by the Perkins Act. They should include endogenous and exogenous data analyses suggested by McDonnell and Grubb (1991). However, in situ measurements combined with the datasets from other sources may provide a better understanding of workforce mobility, career obsolescence, education and training needs, and other socioeconomically founded questions. The five-year follow-up is designed to satisfy the core indicator requirements of the Perkins Act and to assist the SEA and LEAs by providing feedback on their students/graduates for planning and operations purposes.

Flowcharts G15 through G22 depict the five-year follow-up process. The same graduation year cohort is requested to participate in the survey using first an e-mail approach followed by a mail approach. Use of a telephone interviewing process may be an unnecessary burden to place on school divisions. To reduce this burden, the CTEDMS could present the appropriate names and contact information of the five-year follow-up people so they could contact the non-responding one- and five-year follow-up groups at the same time (see the Program Evaluation Implementation Sequence in this chapter). To accomplish this coordinating task will require the CTEDMS to find the location of individuals for both follow-ups. This is why the SSN is very important. Using motor vehicle, employment data, and taxation records, the SSNs could be matched and addresses located. This would modify the contact information in the Students and Graduates Demographics System (see Figure 2). The SEAs automatically administer the

longitudinal follow-up from the CTEDMS. LEAs should be encouraged to participate in the five-year follow-up because it is conducted at the same time annually as the one-year follow-up (see Figure 5). From this database, school systems could status follow-up response rates and make decisions in conjunction with the SEA regarding an appropriate sample size given available resources and time. Schools must assume a larger role in making their response rate representative of the students who participate in CTE. The SEA administration and leadership allocation is a very small portion (5%) of the available Perkins Act funding. The state must provide the program evaluation system, but LEAs must use the system to get the most from the Perkins Act.

The design of the five-year follow-up sub-system is nearly identical to the one-year follow-up. The only changes are in the instrument questions phrasing reflecting the difference in time since leaving high school. A five-year period was selected because those attending four-year institutions would have graduated or be preparing to do so. They would just be starting their careers similar to the high school students who went to work right after graduation. Other respondents will have established careers and be better able to characterize the contribution of their high school education. This period of “life seasoning” may bring to light some of the disparities that occur when choosing a career and making career choices later in life.

As stated earlier, the Perkins Act has a five-year duration. When the Act comes up for re-appropriation, the program evaluation system would be in the preparation stages for conducting the first longitudinal (five-year) follow-up. The researcher believes to have useful data that can be compared and contrasted with inter- and intra-agency data, is to have data from the same graduation cohort groups over a period. This will allow for the transition analysis specifically

identified in Perkins Act core indicator three. This core indicator requires a measurement of not only placement but also retention in postsecondary education or employment. A count of individuals or percentage of all follow-up participants who entered postsecondary education or employment can be measured using the one-year follow-up data. This is not a measurement of retention. The five-year follow-up will indicate both retention and completion rates of those pursuing education. Additional education indicators would include preparation for career changing, career enhancement, and pursuit of graduate studies. Employment statistics of placement, retention, career change, under-employment, and unemployment could be gathered and compared with other groups. If accountability and program improvement are the overarching goals of the Perkins Act, then the measurements that determine whether the goals were achieved must be richer than counting heads and test scores as students leave the schoolhouse door.

Flowchart J3 represents the five-year employer follow-up process. It closely resembles the one-year employer follow-up in both function and context. The context differs only in that five years have passed since the graduation year cohort has left high school. Employers are asked to compare the individual's skills and abilities with other employees having comparable education and job-related experiences.

### *Analysis of Data*

The analysis of data and reporting functions of the conceptual system model satisfy the Perkins III program accountability requirements. Federal, state, and local education agencies must use these data for programmatic improvement. The CTEDMS data in concert with other data resources can have great utility beyond just education program performance measures.

Socioeconomic evaluation at macro and micro levels reflecting the contribution of education is the ultimate utility that a system can offer to policymakers and the public.

SEAs can use the Perkins Act as a means to justify data collection, analysis, and reporting of CTE program performance. Section 113 – paragraph 2b & c of the Perkins III allows SEAs to collect data that go beyond the requirements of the performance core indicators. This lets the states leverage better accountability measurement and analysis using the Perkins Act as one of the motivations. Using state colleges and universities to do analyses on the data produced to comply with the Perkins Act is a way to achieve better understanding of the variables and their influence on education program performance. If the state plan includes the participation of higher education institutions to conduct analysis of the data, the Secretary of Education under Section 114 can authorize grants to support these research efforts.

To serve the needs of the local education agencies, the analysis that is done should be descriptive, indicating specific things that the school systems can act upon. When the descriptive data analysis and research-oriented studies under Perkins III show utility in policy planning and development, action research could be promoted to local school administrators. Comparing their own data and aggregated data of other school systems within the state and nationally could provide the LEAs with a powerful school management tool.

Increasing data availability and analysis is possible by using the technologies suggested in this conceptual system model. Databases connected to the Internet can get information to the right audience in the proper format in a matter of keystrokes and mouse clicks. The CTEDMS is composed of a number of sub-systems with dedicated tasks to perform. Processing can be distributed among a number of computer systems. These computer systems could be located at

individual schools serving the local administrative and operational needs while simultaneously being a sub-system for statewide data collection, analysis, and reporting. Vertical systems integration may provide the best data utilization for a statewide program evaluation system. To do this, however, the SEA and the LEAs will have to coordinate organizationally and systematically to make the entire system work.

### *Reporting Systems*

The CTEDMS produces two types of reports (see Appendix H). The first report type is a standard report. Standard reports are documents produced to comply with federal and state requirements. The formats are fixed and sometimes specified by the requesting agency. They are produced for paper reproduction but can be distributed using electronic means. The typical electronic formats are Hyper Text Markup Language (HTML) or Portable Documents Format (PDF).

HTML formatted reports are usually used in electronic form by web users. The reports can have resource links incorporated into the text or graphics of the reports. This is useful to the report designer and for an audience that must refer to other sources to keep the report in context. The reports can be made to be quite dynamic when designed using both “server” and “client” functions. Dynamic reports are configured by the database tailoring the output based on criteria specified by the system user over the network.

PDF reports are an electronic equivalent of paper. The presentation format is the same as a paper report if that is what is desired. These reports can also be more dynamic by linking resources and form components to the report. The report designer can present and collect data

using PDF formatted reports. Printing a PDF formatted report will reproduce very reliably, closely matching the format of the original document. The most important point is that both of these report formats (HTML and PDF) can be distributed to a mass audience using the Internet as the delivery medium.

Appendix H contains the report process flowcharts. The school divisions, students, graduates, employers, and the public can request reports. Flowchart H1 (Appendix H) is the entry point in the reporting process of the CTEDMS. Each group can review the types of reports available and has access to the Public CTE Program Reports. The Terms and Availability web pages assist the report sub-system users in navigating through the report requesting process and introduce the terms used. Additionally, users are offered links to download any of the necessary web browser plug-ins to view the reports. Usage and interpretation of the data presented in the various report types are also explained.

Division, school, and special reporting features of the CTEDMS are restricted access. The release of this information is controlled by state and/or local policies. Flowcharts H2 and H3 show how the Gatekeeper Access Control System intervenes in these reporting processes. Identifying the authorization of the requestor restricts the division and school reports to the designated people. Schools cannot look at other schools' summary data unless approved by the appropriate person. The standard reports produced for the divisions and schools have fixed formats and are PDF formatted files for reading and reproduction convenience.

Flowchart H3 is the Special Reports and Data Analysis sub-system. This is also a restricted access sub-system controlled by the Gatekeeper database. The special reporting system allows the user to specify search parameters used in the data analysis. The reports produced are

descriptive statistics of the search parameters. Enhancements to this sub-system would offer the users appropriate statistical analysis tools based on the search parameters selected. The goal of special reporting is to increase the utility of the follow-up datasets to the schools as suggested by Levesque, Bradby, Rossi, and Teitelbaum (1998). Introduction of exogenous data from the U.S. Department of Labor or the U.S. Census could provide richer analytical tools for policymakers at the local and state levels. These enhanced analysis tools would assist the Secretary of Education to pursue research and development activities that improve CTE. Under Section 114, research opportunities can be extended to institutions and individuals to address the National Activities section on program performance information - evaluation and assessment (c)(3)(A&B).

The special reports are presented to the user either in HTML or PDF formats. HTML formatted reports are to view over the Internet. These reports are encrypted to limit the viewing to only the requesting system. Flag notes will be presented in the reports when the data are not representative of the characteristics being analyzed as in the standard reports. This is done to assure that the report data are interpreted correctly by qualifying any indicators that may be erroneous. PDF formatted files are used to present the requestor an electronic paper version of the generated report for platform independent distribution and paper reproduction.

### *Program Contacts and Assistance*

To implement the CTEDMS will require training and development of many people in many organizations (see Appendix I). Much of the training and development can be done with school faculty-introduced on-line materials and self-paced on-line instruction supporting the participants. The leadership activities identified by the Perkins Act (Section 124) requires SEAs

to develop program evaluation systems to comply with the legislation. This includes preparing people to use and manage the system. An additional component in managing the CTEDMS is to have support services available to all groups involved in the program evaluation process.

Appendix I is the Program Contacts and Assistance sub-system of the CTEDMS. Having available assistance to solve problems encountered by the system users will improve both the response rate and participant willingness. The goal in developing this sub-system is to make it “user friendly” by giving users resources that will help them solve immediate problems. This includes the use of direct links to resources such as frequently asked questions (FAQ) and a toll-free telephone number to answer questions regarding the program evaluation process and address special needs requests for mailed forms or survey interviews.

To provide support services will require additional resources not usually associated with the program evaluation systems of the past. The Perkins Act is asking for data indicating continuous program improvement and characterizing program attributes that facilitate the transition of individuals from high school to work and/or additional education. To achieve these measures is going to require coordination and support that the SEAs must provide. Answering questions in a timely and responsible manner will enhance the quality of data collected and the legitimacy of the program evaluation system in measuring program performance.

### Program Evaluation Implementation Sequence

The follow-up schedule shown in Figure 4 is divided by school years (SY) as defined by the U.S. Department of Education. One school year is from August 1st to July 31<sup>st</sup> of the next calendar year. Finer gradations are shown as quarters (Q1-Q4) of a school year.

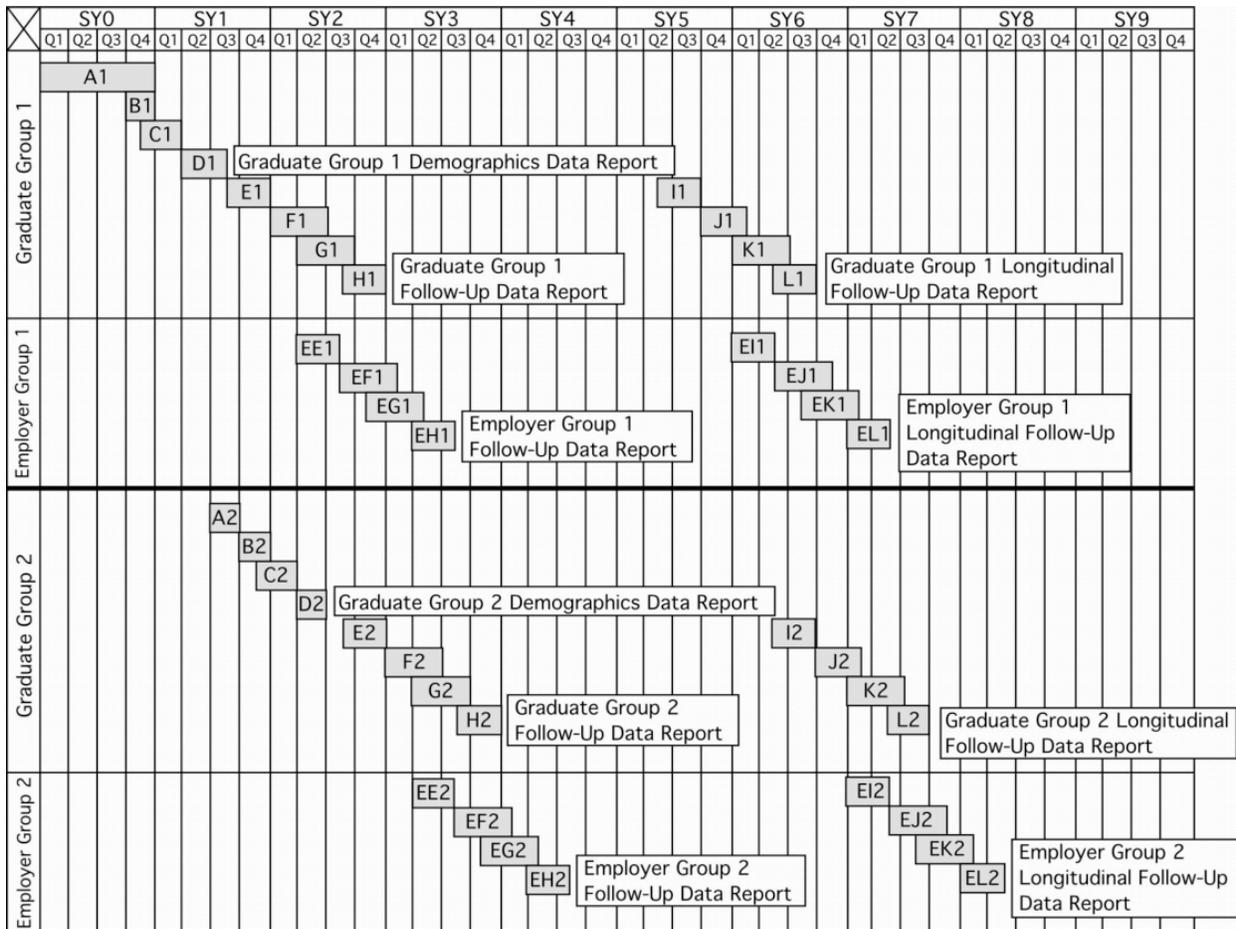


Figure 4. Graduation year cohort follow-up multi-year schedule.

The right side (ordinate) of Figure 4 specifies two distinct groups of participants. The first graduation year cohort (Group 1) is composed of secondary vocational program students/graduates and the employers of individuals in the SY0 graduation year cohort. The second graduation year cohort (Group 2) is composed of students/graduates but these individuals are the following school year's (SY1) secondary program completers or participants and their employers.

The second segment of the Group 1 cohort (see SY5 - I1 and SY5 - EI1) are graduates and students who left high school in SY0 and their current employers. This is the longitudinal component of the program follow-up. The same cohort group is asked to participate in the five-year follow-up so that transitions in their employment and/or education can be measured.

The lower half of Figure 4 is the follow-up cycle repeating one year later for the SY1 students and graduates makeup the second graduation year cohort. The follow-up cycle is an annualized event. As stated in the student/graduate longitudinal follow-up section above, the first longitudinal cycle will not be completed before the Perkins Act comes up for re-appropriation. The Perkins Act is interested in measuring the transition of groups from education to work and whether CTE had a contribution in career choices. To accomplish this measurement will require adequate time for these transitions to occur.

Table 14 supplements Figure 4 by providing activity descriptions of the time bars shown on the timeline. The annual activities and the overlap that occurs between them would necessitate a program evaluation system that has automated features. As shown in Figure 2, the Career and Technical Education Data Management System (CTEDMS) has a support database called School Year Calendar Database (SYCD). The SYCD establishes the time base for the all system components that are time dependent. Table 11 describes database functions of the CTEDMS. One of the table columns was titled "Rollover." Many of the database rollover activities are time dependent.

Sequence dependent functions are algorithmically designed into the CTEDMS. Figure 4 shows the activity sequence to collect, analyze, and report demographics and follow-up data.

Table 14

*Activity Descriptions of the Multi-Year Schedule*

Grad. Year Cohort One-Year Follow-Up		Employer One-Year Follow-Up		Grad. Year Cohort Long. Follow-Up		Employer Long. Follow-Up		Activity Description
Group 1	Group 2	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2	*****
A1	A2	*	*	*	*	*	*	<ul style="list-style-type: none"> <li>• System design and programming (A1 – Q1 and Q2 Only)</li> <li>• Schools prepare students for follow-up</li> <li>• Student demographics data collection</li> </ul>
B1	B2	*	*	*	*	*	*	<ul style="list-style-type: none"> <li>• School demographics validation and submission to SEA</li> </ul>
C1	C2	*	*	*	*	*	*	<ul style="list-style-type: none"> <li>• Demographics data analysis</li> <li>• Standard report layouts</li> </ul>
D1	D2	*	*	*	*	*	*	<ul style="list-style-type: none"> <li>• Release standard reports to Federal government, SEA, and LEAs</li> <li>• Make available special reporting functions to approved individuals and organizations</li> </ul>
E1	E2	EE1	EE2	I1	I2	EI1	EI2	<ul style="list-style-type: none"> <li>• Follow-up preparation</li> </ul>
F1	F2	EF1	EF2	J1	J2	EJ1	EJ2	<ul style="list-style-type: none"> <li>• Follow-up data collection</li> <li>• Standard reports layouts</li> </ul>
G1	G2	EG1	EG2	K1	K2	EK1	EK2	<ul style="list-style-type: none"> <li>• Report generation (std. &amp; special)</li> </ul>
H1	H2	EH1	EH2	L1	L2	EL1	EL2	<ul style="list-style-type: none"> <li>• Release reports to Federal government, SEA, and LEAs</li> <li>• Make available special reporting functions to approved individuals and organizations</li> </ul>

Report issuances are indicated in Figure 4. Reporting is the summative activity for one activity and the transition to another phase of the program evaluation process for each graduation year cohort.

Preparation activities identified in time blocks A1 and A2 of Figure 4 are the times the CTEDMS Introduction (see Appendix E) products are used by students, faculties, and school-designated administrative personnel to learn about the program evaluation process. The first year of the program evaluation requires some developmental and validation activities to assure the introduction materials are providing the correct information to the right people (see Figure 4 -

SY0-A1). Demographics data are collected at this point from vocational program completers and participants at all high school grade levels.

Time blocks B1 and B2 in Figure 4 are when the schools validate the student data. The school CTE Coordinator can coordinate this activity in most cases. With designated clerical assistance, the data can be reviewed for accuracy and completeness. Membership in special populations is a restricted access activity and this data entry should be done with guidance and student records offices to assure the student records are in agreement before submission to the state. The process flowchart for this activity is found in Appendix F (F4 & F5).

When the schools and divisions have validated the demographics data, they submit the data to the SEA. Time blocks C1 and C2 designate the demographics data analysis and the time allocated to accomplish these activities. The data analysis activities conform to the reporting requirements under the Perkins Act – Section 113 and in preparation of the National Activities Section 114. The states must submit in their program plans (Section 122) how they are going to account for vocational program performance in relation to career and/or additional education preparation, employment opportunities both nationally and statewide, and identify special populations within the state vocational student population that benefit from secondary CTE programs. The demographics data analysis is designed to satisfy the state reporting requirements agreed to by the federal government and the state. Concurrent with the data analysis, the SEA program evaluation staff is preparing the standard report layouts for federal, state, and local reports.

Reporting the demographics characteristics of the state vocational program completers and participants with respect to the Perkins Act state plan is the next annual activity in the program

evaluation process. Appendix H shows the reporting process. Demographics data analysis is the first indicator of program performance. It is a snapshot at the time of graduation or leaving high school of the students' preparation for employment and/or the pursuit of additional education.

Standard test scores data are used as a measure of academic preparation. Vocational skills attainment scores measures the students' career proficiencies. Parsing of the program evaluation sample group to characterize the special populations served by CTE is an important component of the reporting process. The detailed analysis of special populations, gender, ethnic, vocational program completion, career objectives, regional, divisional, and school level demographic decompositions is incorporated into the federal reports to comply with the Perkins Act requirements. The federal government must be proactive in keeping the SEAs informed of national reporting activities under Section 114.

There are preparation activities that support both student/graduate follow-ups (Figure 4 - E1 & E2 – one-year follow-up and Figure 4 - I1 & I2 - five-year follow-up) and the employer one-year follow-up (Figure 4 - EE1 & EE2) and the five-year follow-up (Figure 4 - EI1 & EI2). These preparation processes are found in Appendix G – Flowchart G1 for the students/graduates and Appendix J – Flowchart J1 for the employers. The follow-up preparation activities consist of testing the CTEDMS follow-up databases (see Figure 2 – One-Year Graduate Follow-up Database [OYGFD] and Longitudinal Graduate Follow-up Database [LGFD]) for readiness to collect data. Web page-delivered and bubble scan form instruments must be tested during this time. Scripts for conducting phone interviews are prepared and tested. The special needs web site is tested for accessibility and presentation.

A two-month period is allocated for the follow-up data collection process. During this time, the divisions and schools can acquire response rate status reports. The response rate status reports use the same web based report utility as used for the demographics data collection process. The goal in designing the status report sub-system this way is to keep the division and school personnel in an operating environment that is uniform throughout the entire program evaluation process. On flowchart F5 (Appendix F), the “read only search response page” shows only a one-year follow-up completion status. This status indicator is presented to encourage schools to participate in the one-year follow-up administration process. The longitudinal (five-year) follow-up is administered by the SEA. Schools can be active participants in the five-year follow-up, but it is optional. This is to keep the divisions and schools “willingness” levels high by not encumbering them with one of the more difficult aspects of the program evaluation process.

The follow-up reporting process is very similar to the demographics section above. Standard and special reporting features are designed into the CTEDMS. Special reports use database searching and sorting features to compile reports that are based on research inquiries using specific constructs. Designated individuals can make inquiries based on data features of the records in the CTEDMS. This offers legitimate researchers the opportunity to develop research questions and posit them using the CTEDMS. The system is designed not to allow the identification of individuals or groups and will not allow comparisons of schools or systems unless the research is authorized by the SEA. This is to avoid, for example, real estate marketing analysis that may represent the available school information inappropriately. School-to-school comparisons are not allowed except to designated SEA personnel and in compliance with

Perkins Act and/or state requirements. Refer to Appendix H for the CTEDMS reporting process flowcharts.

### Conceptual Model Summary

In this chapter the conceptual program evaluation system model for the Perkins III legislation was developed. The model consisted of a highly automated process using advanced database and data communications technologies to perform its tasks. The system would be under the purview of the SEA and not only support the Perkins III accountability requirements but have the capabilities to serve the needs of state and local program evaluation requirements.

“Operationalizing” the CTE program evaluation process is a complex undertaking. The system strategies, requirements, and conceptual configuration are founded in program evaluation theory. The conceptual model strategies presented here can translate into the design of other systems that support policy-driven program evaluation.

## CHAPTER V

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

#### Summary of Purpose and Methodology

This research was undertaken to construct a conceptual model showing how a program evaluation system would operate in compliance with the policy-based accountability requirements. The Perkins Act of 1998 was chosen as a policy example for building the conceptual model because the researcher was familiar with the legislation and this segment of education. The model and development strategies could be used when designing program evaluation systems for other policy-driven programs.

A system analysis was conducted using four input parameters and four output parameters. The input parameters were legislation, organization, technology, and information. The system analysis process used these four input parameters to construct a conceptual system model.

The output parameters were requirements, the conceptual system configuration, system implementation sequence, and the policy program evaluation philosophy. The policy program evaluation philosophy was a reflection of the legislative intentions. The product of the system analysis was a model of a program evaluation system that could be used and managed by a state education agency. This model was one of many possible variations that could be used to perform the program evaluation tasks.

## Conclusions

Conclusions are presented with respect to the research questions put forth in Chapter I. The conclusions focus on program evaluation system design strategies, CTE program accountability, and system implementation sequence.

### *Program Evaluation System Design Strategies*

The system design strategies developed in this study focused on human services policy-based program evaluation. Policymakers create policies that have accountability components to determine whether programs are performing as intended. Evaluation systems to measure the performance of programs must be developed to collect, analyze, and report information to the policymakers and the clients served by the program. The system design process is a collaborative effort and reflects the interests of many parties. The information produced by the program evaluation system must have utility to the policymakers by sustaining the institutional value to the society. Evaluation is the process of judging whether a program has value. The systems that assists in making those determinations must produce valid and reliable information.

Program performance accountability is a complex undertaking requiring that evaluation systems be designed with consideration of both general development strategies and policy specific requirements. In this research, the first procedure in reducing the problem was to identify the general system development strategies. Eight general system development strategies were identified. They were:

1. Utilitarian program evaluation
2. Isolates the effects of the program

3. Assists in determining program improvement
4. Used as a program management tool
5. Follow-up program participants
6. Integrates data from multiple sources
7. Uses technology that improves system performance
8. Makes the system “usable” to the participants

The system development strategies were founded in program evaluation theory and practices. They would serve as the first tier in the system design process. Selection and analysis of a specific policy using these general system development strategies as guideposts would assist in producing a conceptual program evaluation system model that would “operationalize” the intentions of the policy.

### *Program Accountability*

The Carl D. Perkins Vocational and Technical Education Act of 1998 had a distinctly different focus than its predecessor legislation of 1990. Accountability for program performance with an expectation of continuous improvement was one of the major differences. The common goal between the two, especially since the establishment of vocational education in this country, was determining the number of people who benefited from participating in CTE. Benefits were defined as acquiring entry-level jobs in occupations and/or having the life skills necessary to manage family life. However, the vocational education model is changing because the domestic and international marketplaces are changing. The United States is experiencing socioeconomic changes that are reducing the agricultural and manufacturing economic sectors and increasing the

service sector. This change is a product of global economic development and rapid technological advancements. Labor skills are changing from technology-focused applied skills to more abstract skills that use technology to perform tasks applicable to occupations in multiple economic sectors. Education is addressing these issues by merging abstract (academic) and experiential (vocational) components into curricula that can prepare people for careers and the pursuit of life-long learning (Boesel & McFarland, 1994; Wirt, Muraskin, Goodwin, & Meyer, 1989). The Perkins Act of 1998 was an attempt by the federal government to address the changes needed in CTE.

State education agencies must measure CTE programs' performance against the core indicators. The states must further baseline these measurements (levels of performance) in the first two years of enacting the legislation. This is what defined the gross structure of the CTE accountability process. Individual state plans provided the detailed structure of program performance measurements and the methods for acquiring them. State plans were developed in collaboration with industry, labor, and the public. This provided great opportunities for the interested parties to develop an educational accountability system that could provide program performance feedback and be a useful tool in the management of schools within a state.

The National Activities section (Section 114) specifies the U.S. Department of Education's program performance information requirements comply with the Perkins Act. Perhaps understated in the legislation is the possibility of having vertically integrated program performance systems. Only aggregated state data would be available to the National Center for Education Statistics (NCES) and National Bureau of Labor Statistics (NBLs). No violation to the privacy requirements (Section 5) of the Perkins Act would occur with high levels of data

aggregation. This would reduce the redundancy of program evaluation systems the SEAs and LEAs use to comply with policy mandated reporting requirements. The federal government would have to provide incentives that would increase both “ability” and “willingness” of the states. Ability may be improved by providing access to or procurement assistance of computer and data communications technologies. System simplification and reduction of state or local resources to comply with policy requirements would improve the willingness of SEAs and LEAs.

### *System Implementation Sequence*

The Perkins III legislation has a five-year time span before it comes up for re-authorization. The conceptual system model presented in this research would have completed five demographics data collections, four one-year follow-ups, and no five-year follow-ups during this period. It is difficult for the researcher to understand that one of the primary goals of the legislation is to measure transition of individuals from secondary CTE programs to careers but miss this transition of one portion of the group that pursued post-secondary or higher education. The indicators at this juncture may reveal some very important insights on the contribution CTE made in career choices and the role secondary education plays in building foundations for additional education.

Those individuals who started their careers after leaving high school would also have gained some long-term job experience that could be articulated in the five-year follow-up. From these individuals could come the most revealing information on the future direction of CTE. Employment patterns within groups, occupational areas, or locations may be identified in the

five-year follow-ups of graduating year cohorts. The legislative intent showed insight with the specification of the four core performance indicators. To realize the intent will require a number of intervals to settle the measurements of the program evaluation system and then additional repetitions to gather data that satisfy program performance measurements. This will require considerable federal policy fortitude to achieve the legislative intentions of Perkins III. The resulting information may prove to be invaluable in changing education to meet the needs of a nation that is a leader in a global economy.

### Recommendations

This research developed a conceptual system model to “operationalize” the accountability requirements of the Carl D. Perkins Vocational and Technical Education Act of 1998. The system had the following attributes incorporated in the design:

1. standards based relational database architecture
2. minimal systems technology requirements placed on schools and individuals
3. Internet based data communications
4. automated time and activity based process controls
5. alternative data collection methods to accommodate special needs
6. system change tolerance (robustness)
7. vertical system integration capabilities
8. data utility to LEAs, SEAs, U.S. Department of Education and other agencies.

*Recommendation 1: Develop Unified Data Codification Structures*

This recommendation applies to all program evaluation processes. It is structured around education programs but should be considered in the design of evaluation systems used to measure human development. Building on the investigation of alternative system configurations is to further recommend that unified coding structures be developed for the secondary grades. Curricula and course coding schemes must be unified at the state level. State standards of learning (SOL) and other criteria-referenced activities may offer the foundation to build uniform data codification structures. This would enhance data analysis at the local and state levels. Program articulation improvements may also result using a state unified coding structure. This unified coding structure will have to take into account the integration of academic and vocational subjects. The U.S. Department of Education (2003a) Classification of Instructional Programs (CIP) coding structure would be a good place to begin. Using this type of taxonomic coding structure would allow for flexible secondary programs of study and the development of rubrics that satisfy SOL criteria for graduation and program completion.

Demographic characterizations must also be unified. This would allow socioeconomic comparison and contrast studies to achieve much greater fidelity. There is an acute awareness of federal government to establish standards for demographics data collection. The federal Office of Management and Budget must take the lead in reconciling some of the disparities that will be encountered when comparing census population data with other federal programs demographic data.

*Recommendation 2: Measurement of Transition*

The measurement of transition specified in the Perkins III third core indicator presented some difficulty in developing the conceptual system model. This core indicator combined with the annual assessment of continuous program improvement presented a context for the use of longitudinal program evaluation methods. Of particular concern was just assessing whether a CTE program completer/participant pursued additional education, went to work, or entered the military. This appeared to be a very flat measurement because it did not account for the quality of the experience or successful completion. Specifically, the recommendation is for collecting data that measure the success of and reasons for making the transition, not just counting those who did and those who did not. A successful transition may be an individual who completed a CTE program, entered a postsecondary technical education program that was in a different occupational area, completed the program, and found employment in that field. The reasons for making these choices are motivated by many factors that could offer a richer analysis of program performance and policymaker feedback.

Social Security Number matching is the best way to locate potential follow-up participants. The federal Office of Vocational and Adult Education (OVAE) (see Appendices K and L) addressed this issue. Some states were planning to use unemployment insurance wage records as a means to locate vocational program completers and participants. The Family Educational Rights and Privacy Act (FERPA) (United States Congress, 1974) has strict provisions on the use of student records. OVAE's recommendation is only a work-around, not necessarily a solution. The U.S. Departments of Education and Labor are going to have to work with the Congress to

resolve this issue if the placement, retention, and transition data are to truly indicate the experiences of CTE program participants.

*Recommendation 3: Cost Analysis*

This research activity did not include a cost analysis. SEAs have systems currently in place that collect and analyze data for many education programs. They also have potential access to intra-agency computational system resources that would consist of the elements suggested in this conceptual system model. Each SEA will have to develop its own cost analysis for the development of a system that supports the Perkins III activities. In conducting this cost analysis, a comprehensive systems functional analysis should be accomplished. This may offer ways to reduce development and implementation costs while simultaneously maximizing system resource utilization.

Need for Additional Research

*Program Accountability*

This research developed a conceptual program evaluation system model based on the implementation of a specific federal education policy that emphasized program performance accountability. The model created, however, can be generalized to address other program evaluation requirements. Scaling the model configuration and functions to perform the measurements necessary to characterize program effectiveness can be done for public and private sector human development activities.

Accountability is the crux of the program evaluation system model and the strategies used in its development. A fundamental question that presents itself from the using term accountability is what determines a successful program? The program evaluation system proposed in this research will collect and analyze data and report the findings to the necessary groups. The federal government is asking for measures of program performance to hold agencies accountable for the delivery of services and the appropriate use of funds. The measurements made to satisfy policy requirements are socioeconomic. These measurements are influenced by a complex set of variables that are confounding by their own definition. Elegant statistical analysis methods will have to be used to determine how such complex socioeconomic variables can isolate the contribution of the program in preparing the workforce and what a successful program entails.

Descriptive statistics are only rough indicators of program performance. Incremental percentage improvements in these rough indicators are not necessarily signs of continuous program improvement. Research must be done to use the data collected by the program evaluation system to formulate good education and socioeconomic policies and practices.

#### *Program Evaluation Intrusiveness*

One of the most important aspects of program performance accountability is the measurement of participants' transition. Transition measurement not only monitors the progress of individuals through the program, but also isolates the contribution of the program in making decisions at various junctures in life. Measuring transition requires that the program evaluation system is highly integrated with data collected at the lowest level of aggregation and is a longitudinal design allowing the program participants to be measured at successive intervals. To

successfully accomplish a longitudinal program evaluation requires access to the participants but also to other endogenous and exogenous data sources. This poses considerable system design problems if the policy does not support these methods of collecting data. The program evaluation system design also becomes intrusive.

Perkins III, for example, specifies that no national database can be created to satisfy the requirements of the legislation. However, in other sections of Perkins III, states must have data available for integration into the National Center for Education Statistics (NCES) and the National Bureau for Labor Statistics (NBLIS) systems. This appears to present the program evaluation system designers with a conundrum.

The Department of Education is the “gatekeeper” in making the de facto national program evaluation system work for Perkins III by assuring the SEAs program implementation plans conform to a common structure. The Congress left some gaping holes in the legislation, either intentionally or unintentionally. This situation will ultimately lead to the rational-legal testing of the Perkins Act and other socioeconomic policies with similar constructs. Legal and political policy scholars should take the initiative to conduct research on implications of legislative intentions and the execution of the resulting policies. The legal system may end up being the final test for ambiguous policies resulting in inequitable treatment or harm.

### *Values Reflected in Program Evaluation*

What does society want to know about how well the institutions are doing in creating and executing policy? If there is a strong desire to hold institutions accountable for their performance, then what are we willing to concede individually and collectively to find out? *A*

*Nation at Risk: The Imperative for Education Reform* (National Commission on Excellence in Education, 1983) suggested that the United States education system does a poor job in preparing people for viable participation in the global economy when compared to other countries. Many of the countries used in the comparison and contrast analyses have nationalized education structures. We as a society must decide on what education structure and other socioeconomic structures will be adopted in the 21<sup>st</sup> century United States. This decision will be a reflection of our contemporary value system. The Perkins Act and other socioeconomic policies may provide the answers if the program evaluation measurements are effectively used by policymakers for both near-term and long-range development of policies and the institutions that implement them.

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## APPENDICES

## APPENDIX A

Excerpted Sections of the Carl D. Perkins  
Vocational and Applied Technology Education  
Act of 1998 (20 U.S.C. 2301 et seq.)

## CARL D. PERKINS VOCATIONAL AND APPLIED TECHNOLOGY EDUCATION

## AMENDEMTNS OF 1998

Public Law 105-332  
105th Congress

## An Act

To amend the Carl D. Perkins Vocational and Applied Technology Education Act

## SECTION 1. SHORT TITLE; TABLE OF CONTENTS.

(a) Short Title.--This Act may be cited as the `Carl D. Perkins Vocational and Technical Education Act of 1998.

(b) Table of Contents.--The table of contents for this Act is as follows:

- Sec. 1. Short title; table of contents.
- Sec. 2. Purpose.
- Sec. 3. Definitions.
- Sec. 4. Transition provisions.
- Sec. 5. Privacy.
- Sec. 6. Limitation.
- Sec. 7. Special rule.
- Sec. 8. Authorization of appropriations.

## TITLE I--VOCATIONAL AND TECHNICAL EDUCATION ASSISTANCE TO THE STATES

## Part A--Allotment and Allocation

- Sec. 111. Reservations and State allotment.
- Sec. 112. Within State allocation.
- Sec. 113. Accountability.
- Sec. 114. National activities.
- Sec. 115. Assistance for the outlying areas.
- Sec. 116. Native American program.
- Sec. 117. Tribally controlled postsecondary vocational and technical institutions.
- Sec. 118. Occupational and employment information.

### Part B--State Provisions

- Sec. 121. State administration.
- Sec. 122. State plan.
- Sec. 123. Improvement plans.
- Sec. 124. State leadership activities.

### Part C--Local Provisions

- Sec. 131. Distribution of funds to secondary school programs.
- Sec. 132. Distribution of funds for postsecondary vocational and technical education programs.
- Sec. 133. Special rules for vocational and technical education.
- Sec. 134. Local plan for vocational and technical education programs.
- Sec. 135. Local uses of funds.

## TITLE II--TECH-PREP EDUCATION

- Sec. 201. Short title.
- Sec. 202. Definitions.
- Sec. 203. State allotment and application.
- Sec. 204. Tech-prep education.
- Sec. 205. Consortium applications.
- Sec. 206. Report.
- Sec. 207. Demonstration program.
- Sec. 208. Authorization of appropriations.

## TITLE III--GENERAL PROVISIONS

### Part A--Federal Administrative Provisions

- Sec. 311. Fiscal requirements.
- Sec. 312. Authority to make payments.
- Sec. 313. Construction.
- Sec. 314. Voluntary selection and participation.
- Sec. 315. Limitation for certain students.
- Sec. 316. Federal laws guaranteeing civil rights.
- Sec. 317. Authorization of Secretary.
- Sec. 318. Participation of private school personnel.

### Part B--State Administrative Provisions

- Sec. 321. Joint funding.
- Sec. 322. Prohibition on use of funds to induce out-of-State relocation of businesses.

Sec. 323. State administrative costs.

Sec. 324. Limitation on Federal regulations.

Sec. 325. Student assistance and other Federal programs.

The purpose of this Act is to develop more fully the academic, vocational, and technical skills of secondary students and postsecondary students who elect to enroll in vocational and technical education programs, by--

- (1) building on the efforts of States and localities to develop challenging academic standards;
- (2) promoting the development of services and activities that integrate academic, vocational, and technical instruction, and that link secondary and postsecondary education for participating vocational and technical education students;
- (3) increasing State and local flexibility in providing services and activities designed to develop, implement, and improve vocational and technical education, including tech-prep education; and
- (4) disseminating national research, and providing professional development and technical assistance, that will improve vocational and technical education programs, services, and activities.

### SEC. 3. DEFINITIONS.

In this Act:

(1) Administration.--The term 'administration', when used with respect to an eligible agency or eligible recipient, means activities necessary for the proper and efficient performance of the eligible agency or eligible recipient's duties under this Act, including supervision, but does not include curriculum development activities, personnel development, or research activities.

(2) All aspects of an industry.--The term 'all aspects of an industry' means strong experience in, and comprehensive

understanding of, the industry that the individual is preparing to enter.

(3) Area vocational and technical education school.--The term 'area vocational and technical education school' means--

- (A) a specialized public secondary school used exclusively or principally for the provision of vocational and technical education to individuals who are available for study in preparation for entering the labor market;

(B) the department of a public secondary school exclusively or principally used for providing vocational and technical education in not fewer than 5 different occupational fields to individuals who are available for study in preparation for entering the labor market;

(C) a public or nonprofit technical institution or vocational and technical education school used exclusively or principally for the provision of vocational and technical education to individuals who have completed or left secondary school and who are available for study in preparation for entering the labor market, if the institution or school admits as regular students both individuals who have completed secondary school and individuals who have left secondary school; or

(D) the department or division of an institution of higher education, that operates under the policies of the eligible agency and that provides vocational and technical education in not fewer than five different occupational fields leading to immediate employment but not necessarily leading to a baccalaureate degree, if the department or division admits as regular students both individuals who have completed secondary school and individuals who have left secondary school.

(4) Career guidance and academic counseling.--The term `career guidance and academic counseling' means providing access to information regarding career awareness and planning with respect to an individual's occupational and academic future that shall involve guidance and counseling with respect to career options, financial aid, and postsecondary options.

(5) Charter school.--The term `charter school' has the meaning given the term in section 10306 of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 8066).

(6) Cooperative education.--The term `cooperative education' means a method of instruction of education for individuals who, through written cooperative arrangements between a school and employers, receive instruction, including required academic courses and related vocational and technical education instruction, by alternation of study in school with a job in any occupational field, which alternation shall be planned and supervised by the school and employer so that each contributes to the education and employability of the individual, and may include an arrangement in which work periods

and school attendance may be on alternate half days, full days, weeks, or other periods of time in fulfilling the cooperative program.

(7) Displaced homemaker.--The term `displaced homemaker' means an individual who--

(A)(i) has worked primarily without remuneration to care for a home and family, and for that reason has diminished marketable skills;

(ii) has been dependent on the income of another family member but is no longer supported by that income; or

(iii) is a parent whose youngest dependent child will become ineligible to receive assistance under part A of title IV of the Social Security Act (42 U.S.C. 601 et seq.) not later than 2 years after the date on which the parent applies for assistance under this title; and

(B) is unemployed or underemployed and is experiencing difficulty in obtaining or upgrading employment.

(8) Educational service agency.--The term `educational service agency' has the meaning given the term in section 14101 of the Elementary and Secondary Education Act of 1965.

(9) Eligible agency.--The term `eligible agency' means a State board designated or created consistent with State law as the sole State agency responsible for the administration of vocational and technical education or for supervision of the administration of vocational and technical education in the State.

(10) Eligible institution.--The term `eligible institution' means--

(A) an institution of higher education;

(B) a local educational agency providing education at the postsecondary level;

(C) an area vocational and technical education school providing education at the postsecondary level;

(D) a postsecondary educational institution controlled by the Bureau of Indian Affairs or operated by or on behalf of any Indian tribe that is eligible to contract with the Secretary of the Interior for the administration of programs under the Indian Self-Determination Act or the Act of April 16, 1934 (48 Stat. 596; 25 U.S.C. 452 et seq.);

(E) an educational service agency; or

(F) a consortium of 2 or more of the entities described in subparagraphs (A) through (E).

(11) Eligible recipient.--The term 'eligible recipient' means--

(A) a local educational agency, an area vocational and technical education school, an educational service agency, or a consortium, eligible to receive assistance under section 131; or

(B) an eligible institution or consortium of eligible institutions eligible to receive assistance under section 132.

(12) Governor.--The term 'Governor' means the chief executive officer of a State or an outlying area.

(13) Individual with limited English proficiency.--The term 'individual with limited English proficiency' means a secondary school student, an adult, or an out-of-school youth, who has limited ability in speaking, reading, writing, or understanding the English language, and--

(A) whose native language is a language other than English; or

(B) who lives in a family or community environment in which a language other than English is the dominant language.

(14) Individual with a disability.--

(A) In general.--The term 'individual with a disability' means an individual with any disability (as defined in section 3 of the Americans with Disabilities Act of 1990 (42 U.S.C. 12102)).

(B) Individuals with disabilities.--The term 'individuals with disabilities' means more than 1 individual with a disability.

(15) Institution of higher education.--The term 'institution of higher education' has the meaning given the term in section 101 of the Higher Education Act of 1965.

(16) Local educational agency.--The term 'local educational agency' has the meaning given the term in section 14101 of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 8801).

(17) Nontraditional training and employment.--The term 'nontraditional training and employment' means occupations or fields of work, including careers in computer science, technology, and other emerging high skill occupations, for which individuals from one gender comprise less than 25 percent of the

individuals employed in each such occupation or field of work.

(18) Outlying area.--The term `outlying area' means the United States Virgin Islands, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, the Republic of the Marshall Islands, the Federated States of Micronesia, and the Republic of Palau.

(19) Postsecondary educational institution.--The term `postsecondary educational institution' means--

(A) an institution of higher education that provides not less than a 2-year program of instruction that is acceptable for credit toward a bachelor's degree;

(B) a tribally controlled college or university;  
or

(C) a nonprofit educational institution offering certificate or apprenticeship programs at the postsecondary level.

(20) School dropout.--The term `school dropout' means an individual who is no longer attending any school and who has not received a secondary school diploma or its recognized equivalent.

(21) Secondary school.--The term `secondary school' has the meaning given the term in section 14101 of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 8801).

(22) Secretary.--The term `Secretary' means the Secretary of Education.

(23) Special populations.--The term `special populations' means--

(A) individuals with disabilities;

(B) individuals from economically disadvantaged families, including foster children;

(C) individuals preparing for nontraditional training and employment;

(D) single parents, including single pregnant women;

(E) displaced homemakers; and

(F) individuals with other barriers to educational achievement, including individuals with limited English proficiency.

(24) State.--The term `State', unless otherwise specified, means each of the several States of the United States, the District of Columbia, the Commonwealth of Puerto Rico, and each outlying area.

(25) Support services.--The term `support services' means services related to curriculum modification, equipment modification, classroom modification, supportive personnel, and instructional aids and devices.

(26) Tech-prep program.--The term `tech-prep program' means a program of study that--

(A) combines at least 2 years of secondary education (as determined under State law) and 2 years of postsecondary education in a nonduplicative sequential course of study;

(B) strengthens the applied academic component of vocational and technical education through the integration of academic, and vocational and technical, instruction;

(C) provides technical preparation in an area such as engineering technology, applied science, a mechanical, industrial, or practical art or trade, agriculture, a health occupation, business, or applied economics;

(D) builds student competence in mathematics, science, and communications (including through applied academics) in a coherent sequence of courses; and

(E) leads to an associate degree or a certificate in a specific career field, and to high skill, high wage employment, or further education.

(27) Tribally controlled college or university.--The term `tribally controlled college or university' has the meaning given such term in section 2 of the Tribally Controlled College or University Assistance Act of 1978 (25 U.S.C. 1801(a)(4)).

(28) Tribally controlled postsecondary vocational and technical institution.--The term `tribally controlled postsecondary vocational and technical institution' means an institution of higher education (as defined in section 101 of the Higher Education Act of 1965, except that paragraph (2) of such section shall not be applicable and the reference to Secretary in paragraph (5)(A) of such section shall be deemed to refer to the Secretary of the Interior) that--

(A) is formally controlled, or has been formally sanctioned or chartered, by the governing body of an Indian tribe or Indian tribes;

(B) offers a technical degree or certificate granting program;

(C) is governed by a board of directors or

trustees, a majority of whom are Indians;

(D) demonstrates adherence to stated goals, a philosophy, or a plan of operation, that fosters individual Indian economic and self-sufficiency opportunity, including programs that are appropriate to stated tribal goals of developing individual entrepreneurs and self-sustaining economic infrastructures on reservations;

(E) has been in operation for at least 3 years;

(F) holds accreditation with or is a candidate for accreditation by a nationally recognized accrediting authority for postsecondary vocational and technical education; and

(G) enrolls the full-time equivalent of not less than 100 students, of whom a majority are Indians.

(29) Vocational and technical education.--The term 'vocational and technical education' means organized educational activities that--

(A) offer a sequence of courses that provides individuals with the academic and technical knowledge and skills the individuals need to prepare for further education and for careers (other than careers requiring a baccalaureate, master's, or doctoral degree) in current or emerging employment sectors; and

(B) include competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, of an individual.

(30) Vocational and technical student organization.--

(A) In general.--The term 'vocational and technical student organization' means an organization for individuals enrolled in a vocational and technical education program that engages in vocational and technical activities as an integral part of the instructional program.

(B) State and national units.--An organization described in subparagraph (A) may have State and national units that aggregate the work and purposes of instruction in vocational and technical education at the local level.

#### SEC. 4. TRANSITION PROVISIONS. (OMITTED)

SEC. 5. PRIVACY.

(a) GEPA.--Nothing in this Act shall be construed to supersede the privacy protections afforded parents and students under section 444 of the General Education Provisions Act (20 U.S.C. 1232g), as added by the Family Educational Rights and Privacy Act of 1974 (section 513 of Public Law 93-380; 88 Stat. 571).

(b) Prohibition on Development of National Database.--Nothing in this Act shall be construed to permit the development of a national database of personally identifiable information on individuals receiving services under this Act.

SEC. 6. LIMITATION. (OMITTED)

SEC. 7. SPECIAL RULE. (OMITTED)

SEC. 8. AUTHORIZATION OF APPROPRIATIONS. (OMITTED)

TITLE I--VOCATIONAL AND TECHNICAL EDUCATION ASSISTANCE TO THE STATES

PART A--ALLOTMENT AND ALLOCATION

SEC. 111. RESERVATIONS AND STATE ALLOTMENT. (OMITTED)

SEC. 112. WITHIN STATE ALLOCATION.

(a) In General.--From the amount allotted to each State under section 111 for a fiscal year, the State board (hereinafter referred to as the 'eligible agency') shall make available--

(1) not less than 85 percent for distribution under section 131 or 132, of which not more than 10 percent of the 85 percent may be used in accordance with subsection (c);

(2) not more than 10 percent to carry out State leadership activities described in section 124, of which--

(A) an amount equal to not more than 1 percent of the amount allotted to the State under section 111 for the fiscal year shall be available to serve individuals in State institutions, such as State correctional institutions and institutions that serve individuals with disabilities; and

(B) not less than \$60,000 and not more than

\$150,000 shall be available for services that prepare individuals for nontraditional training and employment; and

(3) an amount equal to not more than 5 percent, or \$250,000, whichever is greater, for administration of the State plan, which may be used for the costs of--

- (A) developing the State plan;
- (B) reviewing the local plans;
- (C) monitoring and evaluating program effectiveness;
- (D) assuring compliance with all applicable Federal laws; and
- (E) providing technical assistance.

(b) Matching Requirement.--Each eligible agency receiving funds made available under subsection (a)(3) shall match, from non-Federal sources and on a dollar-for-dollar basis, the funds received under subsection (a)(3).

(c) Reserve.--

(1) In general.--From amounts made available under subsection (a)(1) to carry out this subsection, an eligible agency may award grants to eligible recipients for vocational and technical education activities described in section 135 in--

- (A) rural areas;
- (B) areas with high percentages of vocational and technical education students;
- (C) areas with high numbers of vocational and technical students; and
- (D) communities negatively impacted by changes resulting from the amendments made by the Carl D. Perkins Vocational and Applied Technology Education Amendments of 1998 to the within State allocation under section 231 of the Carl D. Perkins Vocational and Applied Technology Education Act (as such section 231 was in effect on the day before the date of enactment of the Carl D. Perkins Vocational and Applied Technology Education Amendments of 1998).

(2) Special rule.--Each eligible agency awarding a grant under this subsection shall use the grant funds to serve at least 2 of the categories described in subparagraphs (A) through (D) of paragraph (1).

#### SEC. 113. ACCOUNTABILITY.

(a) Purpose.--The purpose of this section is to establish a State

performance accountability system, comprised of the activities described in this section, to assess the effectiveness of the State in achieving statewide progress in vocational and technical education, and to optimize the return of investment of Federal funds in vocational and technical education activities.

(b) State Performance Measures.--

(1) In general.--Each eligible agency, with input from eligible recipients, shall establish performance measures for a State that consist of--

(A) the core indicators of performance described in paragraph (2)(A);

(B) any additional indicators of performance (if any) identified by the eligible agency under paragraph (2)(B); and

(C) a State adjusted level of performance described in paragraph (3)(A) for each core indicator of performance, and State levels of performance described in paragraph (3)(B) for each additional indicator of performance.

(2) Indicators of performance.--

(A) Core indicators of performance.--Each eligible agency shall identify in the State plan core indicators of performance that include, at a minimum, measures of each of the following:

(i) Student attainment of challenging State established academic, and vocational and technical, skill proficiencies.

(ii) Student attainment of a secondary school diploma or its recognized equivalent, a proficiency credential in conjunction with a secondary school diploma, or a postsecondary degree or credential.

(iii) Placement in, retention in, and completion of, postsecondary education or advanced training, placement in military service, or placement or retention in employment.

(iv) Student participation in and completion of vocational and technical education programs that lead to nontraditional training and employment.

(B) Additional indicators of performance.--An eligible agency, with input from eligible recipients, may identify in the State plan additional indicators of

performance for vocational and technical education activities authorized under the title.

(C) Existing indicators.--If a State previously has developed State performance measures that meet the requirements of this section, the State may use such performance measures to measure the progress of vocational and technical education students.

(D) State role.--Indicators of performance described in this paragraph shall be established solely by each eligible agency with input from eligible recipients.

(3) Levels of performance.--

(A) State adjusted levels of performance for core indicators of performance.--

(i) In general.--Each eligible agency, with input from eligible recipients, shall establish in the State plan submitted under section 122, levels of performance for each of the core indicators of performance described in paragraph (2)(A) for vocational and technical education activities authorized under this title. The levels of performance established under this subparagraph shall, at a minimum--

(I) be expressed in a percentage or numerical form, so as to be objective, quantifiable, and measurable; and

(II) require the State to continually make progress toward improving the performance of vocational and technical education students.

(ii) Identification in the state plan.--Each eligible agency shall identify, in the State plan submitted under section 122, levels of performance for each of the core indicators of performance for the first 2 program years covered by the State plan.

(iii) Agreement on state adjusted levels of performance for first 2 years.--The Secretary and each eligible agency shall reach agreement on the levels of performance for each of the core indicators of performance, for the first 2 program years covered by the State plan, taking into

account the levels identified in the State plan under clause (ii) and the factors described in clause (vi). The levels of performance agreed to under this clause shall be considered to be the State adjusted level of performance for the State for such years and shall be incorporated into the State plan prior to the approval of such plan.

(iv) Role of the secretary.--The role of the Secretary in the agreement described in clauses (iii) and (v) is limited to reaching agreement on the percentage or number of students who attain the State adjusted levels of performance.

(v) Agreement on state adjusted levels of performance for 3rd, 4th, and 5th years.--Prior to the third program year covered by the State plan, the Secretary and each eligible agency shall reach agreement on the State adjusted levels of performance for each of the core indicators of performance for the third, fourth, and fifth program years covered by the State plan, taking into account the factors described in clause (vi). The State adjusted levels of performance agreed to under this clause shall be considered to be the State adjusted levels of performance for the State for such years and shall be incorporated into the State plan.

(vi) Factors.--The agreement described in clause (iii) or (v) shall take into account--

(I) how the levels of performance involved compare with the State adjusted levels of performance established for other States taking into account factors including the characteristics of participants when the participants entered the program and the services or instruction to be provided; and

(II) the extent to which such levels of performance promote continuous improvement on the indicators of performance by such State.

(vii) Revisions.--If unanticipated circumstances arise in a State resulting in a significant change in the factors described in

clause (vi)(II), the eligible agency may request that the State adjusted levels of performance agreed to under clause (iii) or (vi) be revised.

The Secretary shall issue objective criteria and methods for making such revisions.

(B) Levels of performance for additional indicators.--Each eligible agency shall identify in the State plan, State levels of performance for each of the additional indicators of performance described in paragraph (2)(B). Such levels shall be considered to be the State levels of performance for purposes of this title.

(c) Report.--

(1) In general.--Each eligible agency that receives an allotment under section 111 shall annually prepare and submit to the Secretary a report regarding--

(A) the progress of the State in achieving the State adjusted levels of performance on the core indicators of performance; and

(B) information on the levels of performance achieved by the State with respect to the additional indicators of performance, including the levels of performance for special populations.

(2) Special populations.--The report submitted by the eligible agency in accordance with paragraph (1) shall include a quantifiable description of the progress special populations participating in vocational and technical education programs have made in meeting the State adjusted levels of performance established by the eligible agency.

(3) Information dissemination.--The Secretary--

(A) shall make the information contained in such reports available to the general public;

(B) shall disseminate State-by-State comparisons of the information; and

(C) shall provide the appropriate committees of Congress copies of such reports.

## SEC. 114. NATIONAL ACTIVITIES.

## (a) Program Performance Information.--

(1) In general.--The Secretary shall collect performance information about, and report on, the condition of vocational and technical education and on the effectiveness of State and local programs, services, and activities carried out under this title in order to provide the Secretary and Congress, as well as Federal, State, local, and tribal agencies, with information relevant to improvement in the quality and effectiveness of vocational and technical education. The Secretary annually shall report to Congress on the Secretary's aggregate analysis of performance information collected each year pursuant to this title, including an analysis of performance data regarding special populations.

(2) Compatibility.--The Secretary shall, to the extent feasible, ensure that the performance information system is compatible with other Federal information systems.

(3) Assessments.--As a regular part of its assessments, the National Center for Education Statistics shall collect and report information on vocational and technical education for a nationally representative sample of students. Such assessment may include international comparisons.

## (b) Miscellaneous Provisions.--

(1) Collection of information at reasonable cost.--The Secretary shall take such action as may be necessary to secure at reasonable cost the information required by this title. To ensure reasonable cost, the Secretary, in consultation with the National Center for Education Statistics, the Office of Vocational and Adult Education, and an entity assisted under section 118 shall determine the methodology to be used and the frequency with which information is to be collected.

(2) Cooperation of states.--All eligible agencies receiving assistance under this Act shall cooperate with the Secretary in implementing the information systems developed pursuant to this Act.

## (c) Research, Development, Dissemination, Evaluation and Assessment.--

## (1) Single plan.--

(A) In general.--The Secretary may, directly or

through grants, contracts, or cooperative agreements, carry out research, development, dissemination, evaluation and assessment, capacity building, and technical assistance with regard to the vocational and technical education programs under this Act. The Secretary shall develop a single plan for such activities.

(B) Plan.--Such plan shall--

- (i) identify the vocational and technical education activities described in subparagraph (A) the Secretary will carry out under this section;
- (ii) describe how the Secretary will evaluate such vocational and technical education activities in accordance with paragraph (3); and
- (iii) include such other information as the Secretary determines to be appropriate.

(2) Independent advisory panel.--The Secretary shall appoint an independent advisory panel, consisting of vocational and technical education administrators, educators, researchers, and representatives of labor organizations, businesses, parents, guidance and counseling professionals, and other relevant groups, to advise the Secretary on the implementation of the assessment described in paragraph (3), including the issues to be addressed, the methodology of the studies involved, and the findings and recommendations resulting from the assessment. The panel shall submit to the Committee on Education and the Workforce of the House of Representatives, the Committee on Labor and Human Resources of the Senate, and the Secretary an independent analysis of the findings and recommendations resulting from the assessment described in paragraph (3). The Federal Advisory Committee Act (5 U.S.C. App.) shall not apply to the panel established under this subsection.

(3) Evaluation and assessment.--

(A) In general.--From amounts made available under paragraph (8), the Secretary shall provide for the conduct of an independent evaluation and assessment of vocational and technical education programs under this Act through studies and analyses conducted independently through grants, contracts, and cooperative agreements that are awarded on a competitive basis.

(B) Contents.--The assessment required under paragraph (1) shall include descriptions and evaluations

of--

(i) the extent to which State, local, and tribal entities have developed, implemented, or improved State and local vocational and technical education programs and the effect of programs assisted under this Act on that development, implementation, or improvement, including the capacity of State, tribal, and local vocational and technical education systems to achieve the purpose of this Act;

(ii) the extent to which expenditures at the Federal, State, tribal, and local levels address program improvement in vocational and technical education, including the impact of Federal allocation requirements (such as within-State allocation formulas) on the delivery of services;

(iii) the preparation and qualifications of teachers of vocational and technical, and academic, curricula in vocational and technical education programs, as well as shortages of such teachers;

(iv) participation of students in vocational and technical education programs;

(v) academic and employment outcomes of vocational and technical education, including analyses of--

(I) the number of vocational and technical education students and tech-prep students who meet State adjusted levels of performance;

(II) the extent and success of integration of academic, and vocational and technical, education for students participating in vocational and technical education programs; and

(III) the extent to which vocational and technical education programs prepare students for subsequent employment in high-wage, high-skill careers or participation in postsecondary education;

(vi) employer involvement in, and satisfaction with, vocational and technical

education programs;

(vii) the use and impact of educational technology and distance learning with respect to vocational and technical education and tech-prep programs; and

(viii) the effect of State adjusted levels of performance and State levels of performance on the delivery of vocational and technical education services.

(C) Reports.--

(i) In general.--The Secretary shall submit to the Committee on Education and the Workforce of the House of Representatives and the Committee on Labor and Human Resources of the Senate--

(I) an interim report regarding the assessment on or before January 1, 2002; and

(II) a final report, summarizing all studies and analyses that relate to the assessment and that are completed after the assessment, on or before July 1, 2002.

(ii) Prohibition.--Notwithstanding any other provision of law, the reports required by this subsection shall not be subject to any review outside the Department of Education before their transmittal to the Committee on Education and the Workforce of the House of Representatives, the Committee on Labor and Human Resources of the Senate, and the Secretary, but the President, the Secretary, and the independent advisory panel established under paragraph (2) may make such additional recommendations to Congress with respect to the assessment as the President, the Secretary, or the panel determine to be appropriate.

(4) Collection of state information and report.--

(A) In general.--The Secretary may collect and disseminate information from States regarding State efforts to meet State adjusted levels of performance described in section 113.

(B) Report.--The Secretary shall gather any information collected pursuant to subparagraph (A) and

submit a report to the Committee on Education and the Workforce of the House of Representatives and the Committee on Labor and Human Resources of the Senate.

(5) Research.--

(A) In general.--The Secretary, after consulting with the States, shall award grants, contracts, or cooperative agreements on a competitive basis to an institution of higher education, a public or private nonprofit organization or agency, or a consortium of such institutions, organizations, or agencies to establish a national research center or centers--

(i) to carry out research for the purpose of developing, improving, and identifying the most successful methods for successfully addressing the education, employment, and training needs of participants in vocational and technical education programs, including research and evaluation in such activities as--

(I) the integration of vocational and technical instruction, and academic, secondary and postsecondary instruction;

(II) education technology and distance learning approaches and strategies that are effective with respect to vocational and technical education;

(III) State adjusted levels of performance and State levels of performance that serve to improve vocational and technical education programs and student achievement; and

(IV) academic knowledge and vocational and technical skills required for employment or participation in postsecondary education;

(ii) to carry out research to increase the effectiveness and improve the implementation of vocational and technical education programs, including conducting research and development, and studies, providing longitudinal information or formative evaluation with respect to vocational and technical education programs and student achievement;

(iii) to carry out research that can be used to improve teacher training and learning in the vocational and technical education classroom, including--

(I) effective inservice and preservice teacher education that assists vocational and technical education systems; and

(II) dissemination and training activities related to the applied research and demonstration activities described in this subsection, which may also include serving as a repository for information on vocational and technical skills, State academic standards, and related materials; and

(iv) to carry out such other research as the Secretary determines appropriate to assist State and local recipients of funds under this Act.

(B) Report.--The center or centers conducting the activities described in subparagraph (A) shall annually prepare a report of key research findings of such center or centers and shall submit copies of the report to the Secretary, the Committee on Education and the Workforce of the House of Representatives, the Committee on Labor and Human Resources of the Senate, the Library of Congress, and each eligible agency.

(C) Dissemination.--The center or centers shall conduct dissemination and training activities based upon the research described in subparagraph (A).

(6) Demonstrations and dissemination.--

(A) Demonstration program.--The Secretary is authorized to carry out demonstration vocational and technical education programs, to replicate model vocational and technical education programs, to disseminate best practices information, and to provide technical assistance upon request of a State, for the purposes of developing, improving, and identifying the most successful methods and techniques for providing vocational and technical education programs assisted under this Act.

(B) Demonstration partnership.--

(i) In general.--The Secretary shall carry

out a demonstration partnership project involving a 4-year, accredited postsecondary institution, in cooperation with local public education organizations, volunteer groups, and private sector business participants to provide program support, and facilities for education, training, tutoring, counseling, employment preparation, specific skills training in emerging and established professions, and for retraining of military medical personnel, individuals displaced by corporate or military restructuring, migrant workers, as well as other individuals who otherwise do not have access to such services, through multisite, multistate distance learning technologies.

(ii) Program.--Such program may be carried out directly or through grants, contracts, cooperative agreements, or through the national center or centers established under paragraph (5).

(7) Definition.--In this section, the term 'institution of higher education' has the meaning given the term in section 101 of the Higher Education Act of 1965.

(8) Authorization of appropriations.--There are authorized to be appropriated to carry out this section such sums as may be necessary for fiscal year 1999 and each of the 4 succeeding fiscal years.

SEC. 115. ASSISTANCE FOR THE OUTLYING AREAS. (OMITTED)

SEC. 116. NATIVE AMERICAN PROGRAM. (OMITTED)

SEC. 117. TRIBALLY CONTROLLED POSTSECONDARY VOCATIONAL AND TECHNICAL INSTITUTIONS. (OMITTED)

SEC. 118. OCCUPATIONAL AND EMPLOYMENT INFORMATION.

(a) National Activities.--From funds appropriated under subsection (f), the Secretary, in consultation with appropriate Federal agencies, is authorized--

(1) to provide assistance to an entity to enable the entity--

(A) to provide technical assistance to State

entities designated under subsection (b) to enable the State entities to carry out the activities described in subsection (b);

(B) to disseminate information that promotes the replication of high quality practices described in subsection (b);

(C) to develop and disseminate products and services related to the activities described in subsection (b); and

(2) to award grants to States that designate State entities in accordance with subsection (b) to enable the State entities to carry out the State level activities described in subsection (b).

(b) State Level Activities.--In order for a State to receive a grant under this section, the eligible agency and the Governor of the State shall jointly designate an entity in the State--

(1) to provide support for a career guidance and academic counseling program designed to promote improved career and education decisionmaking by individuals (especially in areas of career information delivery and use);

(2) to make available to students, parents, teachers, administrators, and counselors, and to improve accessibility with respect to, information and planning resources that relate educational preparation to career goals and expectations;

(3) to equip teachers, administrators, and counselors with the knowledge and skills needed to assist students and parents with career exploration, educational opportunities, and education financing.

(4) to assist appropriate State entities in tailoring career-related educational resources and training for use by such entities;

(5) to improve coordination and communication among administrators and planners of programs authorized by this Act and by section 15 of the Wagner-Peyser Act at the Federal, State, and local levels to ensure nonduplication of efforts and the appropriate use of shared information and data; and

(6) to provide ongoing means for customers, such as students and parents, to provide comments and feedback on products and services and to update resources, as appropriate, to better meet customer requirements.

(c) Nonduplication.--

(1) Wagner-peyser act.--The State entity designated under subsection (b) may use funds provided under subsection (b) to supplement activities under section 15 of the Wagner-Peyser Act to the extent such activities do not duplicate activities assisted under such section.

(2) Public law 105-220.--None of the functions and activities assisted under this section shall duplicate the functions and activities carried out under Public Law 105-220.

(d) Funding Rule.--Of the amounts appropriated to carry out this section, the Federal entity designated under subsection (a) shall use--

(1) not less than 85 percent to carry out subsection (b);

and

(2) not more than 15 percent to carry out subsection (a).

(e) Report.--The Secretary, in consultation with appropriate Federal agencies, shall prepare and submit to the appropriate committees of Congress, an annual report that includes--

(1) an identification of activities assisted under this section during the prior program year;

(2) a description of the specific products and services assisted under this section that were delivered in the prior program year; and

(3) an assessment of the extent to which States have effectively coordinated activities assisted under this section with activities authorized under section 15 of the Wagner-Peyser Act.

(f) Authorization of Appropriations.--There are authorized to be appropriated to carry out this section such sums as may be necessary for each of the fiscal years 1999 through 2003.

## PART B--STATE PROVISIONS

### SEC. 121. STATE ADMINISTRATION.

(a) Eligible Agency Responsibilities.--

(1) In general.--The responsibilities of an eligible agency under this title shall include--

(A) coordination of the development, submission, and implementation of the State plan, and the evaluation of the program, services, and activities assisted under

this title, including preparation for nontraditional training and employment;

(B) consultation with the Governor and appropriate agencies, groups, and individuals including parents, students, teachers, representatives of businesses, labor organizations, eligible recipients, State and local officials, and local program administrators, involved in the planning, administration, evaluation, and coordination of programs funded under this title;

(C) convening and meeting as an eligible agency (consistent with State law and procedure for the conduct of such meetings) at such time as the eligible agency determines necessary to carry out the eligible agency's responsibilities under this title, but not less than four times annually; and

(D) the adoption of such procedures as the eligible agency considers necessary to--

(i) implement State level coordination with the activities undertaken by the State boards under section 111 of Public Law 105-220; and

(ii) make available to the service delivery system under section 121 of Public Law 105-220 within the State a listing of all school dropout, postsecondary, and adult programs assisted under this title.

(2) Exception.--Except with respect to the responsibilities set forth in paragraph (1), the eligible agency may delegate any of the other responsibilities of the eligible agency that involve the administration, operation, supervision of activities assisted under this title, in whole or in part, to one or more appropriate State agencies.

## SEC. 122. STATE PLAN.

(a) State Plan.--

(1) In general.--Each eligible agency desiring assistance under this title for any fiscal year shall prepare and submit to the Secretary a State plan for a 5-year period, together with such annual revisions as the eligible agency determines to be necessary.

(2) Revisions.--Each eligible agency--

(A) may submit such annual revisions of the State plan to the Secretary as the eligible agency determines

to be necessary; and

(B) shall, after the second year of the 5 year State plan, conduct a review of activities assisted under this title and submit any revisions of the State plan that the eligible agency determines necessary to the Secretary.

(3) Hearing process.--The eligible agency shall conduct public hearings in the State, after appropriate and sufficient notice, for the purpose of affording all segments of the public and interested organizations and groups (including employers, labor organizations, and parents), an opportunity to present their views and make recommendations regarding the State plan. A summary of such recommendations and the eligible agency's response to such recommendations shall be included in the State plan.

(b) Plan Development.--

(1) In general.--The eligible agency shall develop the State plan in consultation with teachers, eligible recipients, parents, students, interested community members, representatives of special populations, representatives of business and industry, and representatives of labor organizations in the State, and shall consult the Governor of the State with respect to such development.

(2) Activities and procedures.--The eligible agency shall develop effective activities and procedures, including access to information needed to use such procedures, to allow the individuals described in paragraph (1) to participate in State and local decisions that relate to development of the State plan.

(c) Plan Contents.--The State plan shall include information that--

(1) describes the vocational and technical education activities to be assisted that are designed to meet or exceed the State adjusted levels of performance, including a description of--

(A) the secondary and postsecondary vocational and technical education programs to be carried out, including programs that will be carried out by the eligible agency to develop, improve, and expand access to quality, state-of-the-art technology in vocational and technical education programs;

(B) the criteria that will be used by the eligible agency in approving applications by eligible recipients for funds under this title;

(C) how such programs will prepare vocational and technical education students for opportunities in postsecondary education or entry into high skill, high wage jobs in current and emerging occupations; and

(D) how funds will be used to improve or develop new vocational and technical education courses;

(2) describes how comprehensive professional development (including initial teacher preparation) for vocational and technical, academic, guidance, and administrative personnel will be provided;

(3) describes how the eligible agency will actively involve parents, teachers, local businesses (including small- and medium-sized businesses), and labor organizations in the planning, development, implementation, and evaluation of such vocational and technical education programs;

(4) describes how funds received by the eligible agency through the allotment made under section 111 will be allocated--

(A) among secondary school vocational and technical education, or postsecondary and adult vocational and technical education, or both, including the rationale for such allocation; and

(B) among any consortia that will be formed among secondary schools and eligible institutions, and how funds will be allocated among the members of the consortia, including the rationale for such allocation;

(5) describes how the eligible agency will--

(A) improve the academic and technical skills of students participating in vocational and technical education programs, including strengthening the academic, and vocational and technical, components of vocational and technical education programs through the integration of academics with vocational and technical education to ensure learning in the core academic, and vocational and technical, subjects, and provide students with strong experience in, and understanding of, all aspects of an industry; and

(B) ensure that students who participate in such vocational and technical education programs are taught to the same challenging academic proficiencies as are

taught to all other students;

(6) describes how the eligible agency will annually evaluate the effectiveness of such vocational and technical education programs, and describe, to the extent practicable, how the eligible agency is coordinating such programs to ensure nonduplication with other existing Federal programs;

(7) describes the eligible agency's program strategies for special populations;

(8) describes how individuals who are members of the special populations--

(A) will be provided with equal access to activities assisted under this title;

(B) will not be discriminated against on the basis of their status as members of the special populations; and

(C) will be provided with programs designed to enable the special populations to meet or exceed State adjusted levels of performance, and prepare special populations for further learning and for high skill, high wage careers;

(9) describe what steps the eligible agency shall take to involve representatives of eligible recipients in the development of the State adjusted levels of performance;

(10) provides assurances that the eligible agency will comply with the requirements of this title and the provisions of the State plan, including the provision of a financial audit of funds received under this title which may be included as part of an audit of other Federal or State programs;

(11) provides assurances that none of the funds expended under this title will be used to acquire equipment (including computer software) in any instance in which such acquisition results in a direct financial benefit to any organization representing the interests of the purchasing entity, the employees of the purchasing entity, or any affiliate of such an organization;

(12) describes how the eligible agency will report data relating to students participating in vocational and technical education in order to adequately measure the progress of the students, including special populations;

(13) describes how the eligible agency will adequately address the needs of students in alternative education programs, if appropriate;

(14) describes how the eligible agency will provide local

educational agencies, area vocational and technical education schools, and eligible institutions in the State with technical assistance;

(15) describes how vocational and technical education relates to State and regional occupational opportunities;

(16) describes the methods proposed for the joint planning and coordination of programs carried out under this title with other Federal education programs;

(17) describes how funds will be used to promote preparation for nontraditional training and employment;

(18) describes how funds will be used to serve individuals in State correctional institutions;

(19) describes how funds will be used effectively to link secondary and postsecondary education;

(20) describes how the eligible agency will ensure that the data reported to the eligible agency from local educational agencies and eligible institutions under this title and the data the eligible agency reports to the Secretary are complete, accurate, and reliable; and

(21) contains the description and information specified in sections 112(b)(8) and 121(c) of Public Law 105-220 concerning the provision of services only for postsecondary students and school dropouts.

(d) Plan Option.--The eligible agency may fulfill the requirements of subsection (a) by submitting a plan under section 501 of Public Law 105-220.

(e) Plan Approval.--

(1) In general.--The Secretary shall approve a State plan, or a revision to an approved State plan, unless the Secretary determines that--

(A) the State plan, or revision, respectively, does not meet the requirements of this section; or

(B) the State's levels of performance on the core indicators of performance consistent with section 113 are not sufficiently rigorous to meet the purpose of this Act.

(2) Disapproval.--The Secretary shall not finally disapprove a State plan, except after giving the eligible agency notice and an opportunity for a hearing.

(3) Consultation.--The eligible agency shall develop the portion of each State plan relating to the amount and uses of any funds proposed to be reserved for adult vocational and

technical education, postsecondary vocational and technical education, tech-prep education, and secondary vocational and technical education after consultation with the State agency responsible for supervision of community colleges, technical institutes, or other 2-year postsecondary institutions primarily engaged in providing postsecondary vocational and technical education, and the State agency responsible for secondary education. If a State agency finds that a portion of the final State plan is objectionable, the State agency shall file such objections with the eligible agency. The eligible agency shall respond to any objections of the State agency in the State plan submitted to the Secretary.

(4) Timeframe.--A State plan shall be deemed approved by the Secretary if the Secretary has not responded to the eligible agency regarding the State plan within 90 days of the date the Secretary receives the State plan.

(f) Transition.--This section shall be subject to section 4 for fiscal year 1999 only, with respect to activities under this section.

#### SEC. 123. IMPROVEMENT PLANS.

(a) State Program Improvement Plan.--If a State fails to meet the State adjusted levels of performance described in the report submitted under section 113(c), the eligible agency shall develop and implement a program improvement plan in consultation with appropriate agencies, individuals, and organizations for the first program year succeeding the program year in which the eligible agency failed to meet the State adjusted levels of performance, in order to avoid a sanction under subsection (d).

(b) Local Evaluation.--Each eligible agency shall evaluate annually, using the State adjusted levels of performance, the vocational and technical education activities of each eligible recipient receiving funds under this title.

(c) Local Improvement Plan.--

(1) In general.--If, after reviewing the evaluation, the eligible agency determines that an eligible recipient is not making substantial progress in achieving the State adjusted levels of performance, the eligible agency shall--

(A) conduct an assessment of the educational needs that the eligible recipient shall address to overcome local performance deficiencies;

(B) enter into an improvement plan based on the

results of the assessment, which plan shall include instructional and other programmatic innovations of demonstrated effectiveness, and where necessary, strategies for appropriate staffing and staff development; and

(C) conduct regular evaluations of the progress being made toward reaching the State adjusted levels of performance.

(2) Consultation.--The eligible agency shall conduct the activities described in paragraph (1) in consultation with teachers, parents, other school staff, appropriate agencies, and other appropriate individuals and organizations.

(d) Sanctions.--

(1) Technical assistance.--If the Secretary determines that an eligible agency is not properly implementing the eligible agency's responsibilities under section 122, or is not making substantial progress in meeting the purpose of this Act, based on the State adjusted levels of performance, the Secretary shall work with the eligible agency to implement improvement activities consistent with the requirements of this Act.

(2) Failure.--If an eligible agency fails to meet the State adjusted levels of performance, has not implemented an improvement plan as described in paragraph (1), has shown no improvement within 1 year after implementing an improvement plan as described in paragraph (1), or has failed to meet the State adjusted levels of performance for 2 or more consecutive years, the Secretary may, after notice and opportunity for a hearing, withhold from the eligible agency all, or a portion of, the eligible agency's allotment under this title. The Secretary may waive the sanction under this paragraph due to exceptional or uncontrollable circumstances such as a natural disaster or a precipitous and unforeseen decline in the financial resources of the State.

(3) Funds resulting from reduced allotments.--

(A) In general.--The Secretary shall use funds withheld under paragraph (2), for a State served by an eligible agency, to provide (through alternative arrangements) services and activities within the State to meet the purpose of this Act.

(B) Redistribution.--If the Secretary cannot satisfactorily use funds withheld under paragraph (2), then the amount of funds retained by the Secretary as a

result of a reduction in an allotment made under paragraph (2) shall be redistributed to other eligible agencies in accordance with section 111.

#### SEC. 124. STATE LEADERSHIP ACTIVITIES.

(a) General Authority.--From amounts reserved under section 112(a)(2), each eligible agency shall conduct State leadership activities.

(b) Required Uses of Funds.--The State leadership activities described in subsection (a) shall include--

(1) an assessment of the vocational and technical education programs carried out with funds under this title that includes an assessment of how the needs of special populations are being met and how such programs are designed to enable special populations to meet State adjusted levels of performance and prepare the special populations for further learning or for high skill, high wage careers;

(2) developing, improving, or expanding the use of technology in vocational and technical education that may include--

(A) training of vocational and technical education personnel to use state-of-the-art technology, that may include distance learning;

(B) providing vocational and technical education students with the academic, and vocational and technical skills that lead to entry into the high technology and telecommunications field; or

(C) encouraging schools to work with high technology industries to offer voluntary internships and mentoring programs;

(3) professional development programs, including providing comprehensive professional development (including initial teacher preparation) for vocational and technical, academic, guidance, and administrative personnel, that--

(A) will provide inservice and preservice training in state-of-the-art vocational and technical education programs and techniques, effective teaching skills based on research, and effective practices to improve parental and community involvement; and

(B) will help teachers and personnel to assist students in meeting the State adjusted levels of performance established under section 113;

(C) will support education programs for teachers of vocational and technical education in public schools and other public school personnel who are involved in the direct delivery of educational services to vocational and technical education students to ensure that such teachers stay current with the needs, expectations, and methods of industry; and

(D) is integrated with the professional development activities that the State carries out under title II of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 6001 et seq.) and title II of the Higher Education Act of 1965;

(4) support for vocational and technical education programs that improve the academic, and vocational and technical skills of students participating in vocational and technical education programs by strengthening the academic, and vocational and technical components of such vocational and technical education programs through the integration of academics with vocational and technical education to ensure learning in the core academic, and vocational and technical subjects;

(5) providing preparation for nontraditional training and employment;

(6) supporting partnerships among local educational agencies, institutions of higher education, adult education providers, and, as appropriate, other entities, such as employers, labor organizations, parents, and local partnerships, to enable students to achieve State academic standards, and vocational and technical skills;

(7) serving individuals in State institutions, such as State correctional institutions and institutions that serve individuals with disabilities; and

(8) support for programs for special populations that lead to high skill, high wage careers.

(c) Permissible Uses of Funds.--The leadership activities described in subsection (a) may include--

(1) technical assistance for eligible recipients;

(2) improvement of career guidance and academic counseling programs that assist students in making informed academic, and vocational and technical education decisions;

(3) establishment of agreements between secondary and postsecondary vocational and technical education programs in

order to provide postsecondary education and training opportunities for students participating in such vocational and technical education programs, such as tech-prep programs;

(4) support for cooperative education;

(5) support for vocational and technical student organizations, especially with respect to efforts to increase the participation of students who are members of special populations;

(6) support for public charter schools operating secondary vocational and technical education programs;

(7) support for vocational and technical education programs that offer experience in, and understanding of, all aspects of an industry for which students are preparing to enter;

(8) support for family and consumer sciences programs;

(9) support for education and business partnerships;

(10) support to improve or develop new vocational and technical education courses;

(11) providing vocational and technical education programs for adults and school dropouts to complete their secondary school education; and

(12) providing assistance to students, who have participated in services and activities under this title, in finding an appropriate job and continuing their education.

(d) Restriction on Uses of Funds.--An eligible agency that receives funds under section 112(a)(2) may not use any of such funds for administrative costs.

## PART C--LOCAL PROVISIONS

### SEC. 131. DISTRIBUTION OF FUNDS TO SECONDARY SCHOOL PROGRAMS.

(a) Distribution for Fiscal Year 1999.--Except as provided in section 133 and as otherwise provided in this section, each eligible agency shall distribute the portion of the funds made available under section 112(a)(1) to carry out this section for fiscal year 1999 to local educational agencies within the State as follows:

(1) Seventy percent.--From 70 percent of such portion, each local educational agency shall be allocated an amount that bears the same relationship to such 70 percent as the amount

such local educational agency was allocated under section 1124 of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 6333) for the preceding fiscal year bears to the total amount received under such section by all local educational agencies in the State for such preceding fiscal year.

(2) Twenty percent.--From 20 percent of such portion, each local educational agency shall be allocated an amount that bears the same relationship to such 20 percent as the number of students with disabilities who have individualized education programs under section 614(d) of the Individuals with Disabilities Education Act (20 U.S.C. 1414(d)) served by such local educational agency for the preceding fiscal year bears to the total number of such students served by all local educational agencies in the State for such preceding fiscal year.

(3) Ten percent.--From 10 percent of such portion, each local educational agency shall be allocated an amount that bears the same relationship to such 10 percent as the number of students enrolled in schools and adults enrolled in training programs under the jurisdiction of such local educational agency for the preceding fiscal year bears to the number of students enrolled in schools and adults enrolled in training programs under the jurisdiction of all local educational agencies in the State for such preceding fiscal year.

(b) Special Distribution Rules for Succeeding Fiscal Years.-- Except as provided in section 133 and as otherwise provided in this section, each eligible agency shall distribute the portion of funds made available under section 112(a)(1) to carry out this section for fiscal year 2000 and succeeding fiscal years to local educational agencies within the State as follows:

(1) 30 percent.--30 percent shall be allocated to such local educational agencies in proportion to the number of individuals aged 15 through 19, inclusive, who reside in the school district served by such local educational agency for the preceding fiscal year compared to the total number of such individuals who reside in the school districts served by all local educational agencies in the State for such preceding fiscal year.

(2) 70 percent.--70 percent shall be allocated to such local educational agencies in proportion to the number of individuals aged 15 through 19, inclusive, who reside in the school district served by such local educational agency from

families with incomes below the poverty line (as defined by the Office of Management and Budget and revised annually in accordance with section 673(2) of the Community Services Block Grant Act (42 U.S.C. 9902(2))) applicable to a family of the size involved for the fiscal year for which the determination is made compared to the number of such individuals who reside in the school districts served by all the local educational agencies in the State for such preceding fiscal year.

(c) Waiver for More Equitable Distribution.--The Secretary may waive the application of subsection (b) in the case of any eligible agency that submits to the Secretary an application for such a waiver that--

(1) demonstrates that a proposed alternative formula more effectively targets funds on the basis of poverty (as defined by the Office of Management and Budget and revised annually in accordance with section 673(2) of the Community Services Block Grant Act (42 U.S.C. 9902(2))) to local educational agencies within the State than the formula described in subsection (b); and

(2) includes a proposal for such an alternative formula.

(d) Minimum Allocation.--

(1) In general.--Except as provided in paragraph (2), a local educational agency shall not receive an allocation under subsection (a) unless the amount allocated to such agency under subsection (a) is greater than \$15,000. A local educational agency may enter into a consortium with other local educational agencies for purposes of meeting the minimum allocation requirement of this paragraph.

(2) Waiver.--The eligible agency shall waive the application of paragraph (1) in any case in which the local educational agency--

(A)(i) is located in a rural, sparsely populated area, or

(ii) is a public charter school operating secondary vocational and technical education programs; and

(B) demonstrates that the local educational agency is unable to enter into a consortium for purposes of providing activities under this part.

(3) Redistribution.--Any amounts that are not allocated by reason of paragraph (1) or paragraph (2) shall be redistributed

to local educational agencies that meet the requirements of paragraph (1) or (2) in accordance with the provisions of this section.

(e) Limited Jurisdiction Agencies.--

(1) In general.--In applying the provisions of subsection (a), no eligible agency receiving assistance under this title shall allocate funds to a local educational agency that serves only elementary schools, but shall distribute such funds to the local educational agency or regional educational agency that provides secondary school services to secondary school students in the same attendance area.

(2) Special rule.--The amount to be allocated under paragraph (1) to a local educational agency that has jurisdiction only over secondary schools shall be determined based on the number of students that entered such secondary schools in the previous year from the elementary schools involved.

(f) Allocations to Area Vocational and Technical Education Schools and Educational Service Agencies.--

(1) In general.--Each eligible agency shall distribute the portion of funds made available under section 112(a)(1) for any fiscal year by such eligible agency for secondary school vocational and technical education activities under this section to the appropriate area vocational and technical education school or educational service agency in any case in which the area vocational and technical education school or educational service agency, and the local educational agency concerned--

(A) have formed or will form a consortium for the purpose of receiving funds under this section; or

(B) have entered into or will enter into a cooperative arrangement for such purpose.

(2) Allocation basis.--If an area vocational and technical education school or educational service agency meets the requirements of paragraph (1), then the amount that would otherwise be distributed to the local educational agency shall be allocated to the area vocational and technical education school, the educational service agency, and the local educational agency based on each school, agency or entity's relative share of students who are attending vocational and

technical education programs (based, if practicable, on the average enrollment for the preceding 3 years;

(3) Appeals procedure.--The eligible agency shall establish an appeals procedure for resolution of any dispute arising between a local educational agency and an area vocational and technical education school or an educational service agency with respect to the allocation procedures described in this section, including the decision of a local educational agency to leave a consortium or terminate a cooperative arrangement.

(g) Consortium Requirements.--

(1) Alliance.--Any local educational agency receiving an allocation that is not sufficient to conduct a program which meets the requirements of section 135 is encouraged to--

(A) form a consortium or enter into a cooperative agreement with an area vocational and technical education school or educational service agency offering programs that meet the requirements of section 135;

(B) transfer such allocation to the area vocational and technical education school or educational service agency; and

(C) operate programs that are of sufficient size, scope, and quality to be effective.

(2) Funds to consortium.--Funds allocated to a consortium formed to meet the requirements of this paragraph shall be used only for purposes and programs that are mutually beneficial to all members of the consortium and can be used only for programs authorized under this title. Such funds may not be reallocated to individual members of the consortium for purposes or programs benefiting only one member of the consortium.

(h) Data.--The Secretary shall collect information from eligible agencies regarding the specific dollar allocations made available by the eligible agency for vocational and technical education programs under subsections (a), (b), (c), and (d) and how these allocations are distributed to local educational agencies, area vocational and technical education schools, and educational service agencies, within the State in accordance with this section.

(i) Special Rule.--Each eligible agency distributing funds under this section shall treat a secondary school funded by the Bureau of Indian Affairs within the State as if such school were a local educational agency within the State for the purpose of receiving a

distribution under this section.

SEC. 132. DISTRIBUTION OF FUNDS FOR POSTSECONDARY VOCATIONAL AND TECHNICAL EDUCATION PROGRAMS. (OMITTED)

SEC. 133. SPECIAL RULES FOR VOCATIONAL AND TECHNICAL EDUCATION.

(a) Special Rule for Minimal Allocation.--

(1) General authority.--Notwithstanding the provisions of sections 131 and 132 and in order to make a more equitable distribution of funds for programs serving the areas of greatest economic need, for any program year for which a minimal amount is made available by an eligible agency for distribution under section 131 or 132, such State may distribute such minimal amount for such year--

(A) on a competitive basis; or

(B) through any alternative method determined by the State.

(2) Minimal amount.--For purposes of this section, the term 'minimal amount' means not more than 15 percent of the total amount made available for distribution under section 112(a)(1).

(b) Redistribution.--

(1) In general.--In any academic year that an eligible recipient does not expend all of the amounts the eligible recipient is allocated for such year under section 131 or 132, such eligible recipient shall return any unexpended amounts to the eligible agency to be reallocated under section 131 or 132, as appropriate.

(2) Redistribution of amounts returned late in an academic year.--In any academic year in which amounts are returned to the eligible agency under section 131 or 132 and the eligible agency is unable to reallocate such amounts according to such sections in time for such amounts to be expended in such academic year, the eligible agency shall retain such amounts for distribution in combination with amounts provided under section 112(a)(1) for the following academic year.

(c) Construction.--Nothing in section 131 or 132 shall be construed--

(1) to prohibit a local educational agency or a consortium

thereof that receives assistance under section 131, from working with an eligible institution or consortium thereof that receives assistance under section 132, to carry out secondary school vocational and technical education programs in accordance with this title;

(2) to prohibit an eligible institution or consortium thereof that receives assistance under section 132, from working with a local educational agency or consortium thereof that receives assistance under section 131, to carry out postsecondary and adult vocational and technical education programs in accordance with this title; or

(3) to require a charter school, that provides vocational and technical education programs and is considered a local educational agency under State law, to jointly establish the charter school's eligibility for assistance under this title unless the charter school is explicitly permitted to do so under the State's charter school statute.

(d) Consistent Application.--For purposes of this section, the eligible agency shall provide funds to charter schools offering vocational and technical education programs in the same manner as the eligible agency provides those funds to other schools. Such vocational and technical education programs within a charter school shall be of sufficient size, scope, and quality to be effective.

#### SEC. 134. LOCAL PLAN FOR VOCATIONAL AND TECHNICAL EDUCATION PROGRAMS.

(a) Local Plan Required.--Any eligible recipient desiring financial assistance under this part shall, in accordance with requirements established by the eligible agency (in consultation with such other educational entities as the eligible agency determines to be appropriate) submit a local plan to the eligible agency. Such local plan shall cover the same period of time as the period of time applicable to the State plan submitted under section 122.

(b) Contents.--The eligible agency shall determine requirements for local plans, except that each local plan shall--

(1) describe how the vocational and technical education programs required under section 135(b) will be carried out with funds received under this title;

(2) describe how the vocational and technical education activities will be carried out with respect to meeting State

adjusted levels of performance established under section 113;

(3) describe how the eligible recipient will--

(A) improve the academic and technical skills of students participating in vocational and technical education programs by strengthening the academic, and vocational and technical components of such programs through the integration of academics with vocational and technical education programs through a coherent sequence of courses to ensure learning in the core academic, and vocational and technical subjects;

(B) provide students with strong experience in and understanding of all aspects of an industry; and

(C) ensure that students who participate in such vocational and technical education programs are taught to the same challenging academic proficiencies as are taught for all other students;

(4) describe how parents, students, teachers, representatives of business and industry, labor organizations, representatives of special populations, and other interested individuals are involved in the development, implementation, and evaluation of vocational and technical education programs assisted under this title, and how such individuals and entities are effectively informed about, and assisted in understanding, the requirements of this title;

(5) provide assurances that the eligible recipient will provide a vocational and technical education program that is of such size, scope, and quality to bring about improvement in the quality of vocational and technical education programs;

(6) describe the process that will be used to independently evaluate and continuously improve the performance of the eligible recipient;

(7) describe how the eligible recipient--

(A) will review vocational and technical education programs, and identify and adopt strategies to overcome barriers that result in lowering rates of access to or lowering success in the programs, for special populations; and

(B) will provide programs that are designed to enable the special populations to meet the State adjusted levels of performance;

(8) describe how individuals who are members of the special populations will not be discriminated against on the basis of their status as members of the special populations;

(9) describe how funds will be used to promote preparation for nontraditional training and employment; and

(10) describe how comprehensive professional development (including initial teacher preparation) for vocational and technical, academic, guidance, and administrative personnel will be provided.

#### SEC. 135. LOCAL USES OF FUNDS.

(a) General Authority.--Each eligible recipient that receives funds under this part shall use such funds to improve vocational and technical education programs.

(b) Requirements for Uses of Funds.--Funds made available to eligible recipients under this part shall be used to support vocational and technical education programs that--

(1) strengthen the academic, and vocational and technical skills of students participating in vocational and technical education programs by strengthening the academic, and vocational and technical components of such programs through the integration of academics with vocational and technical education programs through a coherent sequence of courses to ensure learning in the core academic, and vocational and technical subjects;

(2) provide students with strong experience in and understanding of all aspects of an industry;

(3) develop, improve, or expand the use of technology in vocational and technical education, which may include--

(A) training of vocational and technical education personnel to use state-of-the-art technology, which may include distance learning;

(B) providing vocational and technical education students with the academic, and vocational and technical skills that lead to entry into the high technology and telecommunications field; or

(C) encouraging schools to work with high technology industries to offer voluntary internships and mentoring programs;

(4) provide professional development programs to teachers, counselors, and administrators, including--

(A) inservice and preservice training in state-of-the-art vocational and technical education programs and techniques, in effective teaching skills based on research, and in effective practices to improve parental

and community involvement;

(B) support of education programs for teachers of vocational and technical education in public schools and other public school personnel who are involved in the direct delivery of educational services to vocational and technical education students, to ensure that such teachers and personnel stay current with all aspects of an industry;

(C) internship programs that provide business experience to teachers; and

(D) programs designed to train teachers specifically in the use and application of technology;

(5) develop and implement evaluations of the vocational and technical education programs carried out with funds under this title, including an assessment of how the needs of special populations are being met;

(6) initiate, improve, expand, and modernize quality vocational and technical education programs;

(7) provide services and activities that are of sufficient size, scope, and quality to be effective; and

(8) link secondary vocational and technical education and postsecondary vocational and technical education, including implementing tech-prep programs.

(c) Permissive.--Funds made available to an eligible recipient under this title may be used--

(1) to involve parents, businesses, and labor organizations as appropriate, in the design, implementation, and evaluation of vocational and technical education programs authorized under this title, including establishing effective programs and procedures to enable informed and effective participation in such programs;

(2) to provide career guidance and academic counseling for students participating in vocational and technical education programs;

(3) to provide work-related experience, such as internships, cooperative education, school-based enterprises, entrepreneurship, and job shadowing that are related to vocational and technical education programs;

(4) to provide programs for special populations;

(5) for local education and business partnerships;

(6) to assist vocational and technical student organizations;

- (7) for mentoring and support services;
- (8) for leasing, purchasing, upgrading or adapting equipment, including instructional aides;
- (9) for teacher preparation programs that assist individuals who are interested in becoming vocational and technical education instructors, including individuals with experience in business and industry;
- (10) for improving or developing new vocational and technical education courses;
- (11) to provide support for family and consumer sciences programs;
- (12) to provide vocational and technical education programs for adults and school dropouts to complete their secondary school education;
- (13) to provide assistance to students who have participated in services and activities under this title in finding an appropriate job and continuing their education;
- (14) to support nontraditional training and employment activities; and
- (15) to support other vocational and technical education activities that are consistent with the purpose of this Act.

(d) Administrative Costs.--Each eligible recipient receiving funds under this part shall not use more than 5 percent of the funds for administrative costs associated with the administration of activities assisted under this section.

## TITLE II--TECH-PREP EDUCATION

SEC. 201. SHORT TITLE. (OMITTED)

SEC. 202. DEFINITIONS. (OMITTED)

SEC. 203. STATE ALLOTMENT AND APPLICATION. (OMITTED)

SEC. 204. TECH-PREP EDUCATION. (OMITTED)

SEC. 205. CONSORTIUM APPLICATIONS. (OMITTED)

SEC. 206. REPORT. (OMITTED)

SEC. 207. DEMONSTRATION PROGRAM. (OMITTED)

SEC. 208. AUTHORIZATION OF APPROPRIATIONS.

TITLE III--GENERAL PROVISIONS

PART A--FEDERAL ADMINISTRATIVE PROVISIONS

SEC. 311. FISCAL REQUIREMENTS. (OMITTED)

SEC. 312. AUTHORITY TO MAKE PAYMENTS. (OMITTED)

SEC. 313. CONSTRUCTION. (OMITTED)

SEC. 314. VOLUNTARY SELECTION AND PARTICIPATION. (OMITTED)

SEC. 315. LIMITATION FOR CERTAIN STUDENTS. (OMITTED)

SEC. 316. FEDERAL LAWS GUARANTEEING CIVIL RIGHTS. (OMITTED)

SEC. 317. AUTHORIZATION OF SECRETARY. (OMITTED)

SEC. 318. PARTICIPATION OF PRIVATE SCHOOL PERSONNEL. (OMITTED)

PART B--STATE ADMINISTRATIVE PROVISIONS

SEC. 321. JOINT FUNDING. (OMITTED)

SEC. 322. PROHIBITION ON USE OF FUNDS TO INDUCE  
OUT-OF-STATE RELOCATION OF BUSINESSES. (OMITTED)

SEC. 323. STATE ADMINISTRATIVE COSTS. (OMITTED)

SEC. 324. LIMITATION ON FEDERAL REGULATIONS. (OMITTED)

SEC. 325. STUDENT ASSISTANCE AND OTHER FEDERAL PROGRAMS. (OMITTED)

SEC. 2. PROMOTING SCHOLAR-ATHLETE COMPETITIONS. (OMITTED)

SEC. 3. REFERENCES TO CARL D. PERKINS VOCATIONAL AND APPLIED

TECHNOLOGY EDUCATION ACT. (OMITTED)

SEC. 4. ADULT EDUCATION AND FAMILY LITERACY. (OMITTED)

SEC. 5. TECHNICAL AND CONFORMING AMENDMENTS. (OMITTED)

SEC. 6. REPEALS AND EXTENSIONS OF PREVIOUS HIGHER EDUCATION  
AMENDMENTS PROVISIONS. (OMITTED)

Approved October 31, 1998.

LEGISLATIVE HISTORY--H.R. 1853:

---

HOUSE REPORTS: Nos. 105-177 (Comm. on Education and the Workforce) and  
105-800 (Comm. of Conference).

CONGRESSIONAL RECORD:

Vol. 143 (1997):

July 17, 22, considered and passed  
House.

Vol. 144 (1998):

June 12, considered and passed  
Senate, amended.

Oct. 8, House and Senate agreed to  
conference report.

## APPENDIX B

### Technology References

## TECHNOLOGY REFERENCES

This reference list was supplied to document the research materials used to develop the conceptual systems model. The researcher is a system design engineer and has numerous years of experience developing integrated systems for educational, commercial and government clients. Many of the technologies used in the development of the conceptual system model are available from multiple sources. The intention of this research effort was to synthesize the system design strategies to satisfy policy and program evaluation requirements. **The technology references listed below should in no way be construed as an endorsement for any practices, products, policies or manufactures.**

This reference list is far from exhaustive. The Internet provides access to a limitless number of resources for the development of program evaluation systems. Many skills are required to develop systems of this nature. Education and training are required to accomplish the task successfully. Information analysis can paint various shades of gray either being constructive closely indicating reality or distort a situation by missing the intended measurement.

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## APPENDIX C

### Career and Technical Education Data Management System (CTEDMS)

#### Process Flowchart Purpose and Symbology

# CTEDMS Flowchart Purpose

---

- To show the logical flow of data from user input, through data processing, to delivery of information to individual's and organization's that make education policy and enhance teaching and learning
- Specify process operations and performance requirements
- Identify technologies that compose the system
- Use a graphical method to convey complex operations consisting of many variables
- Demonstrate web site design and addressing scheme

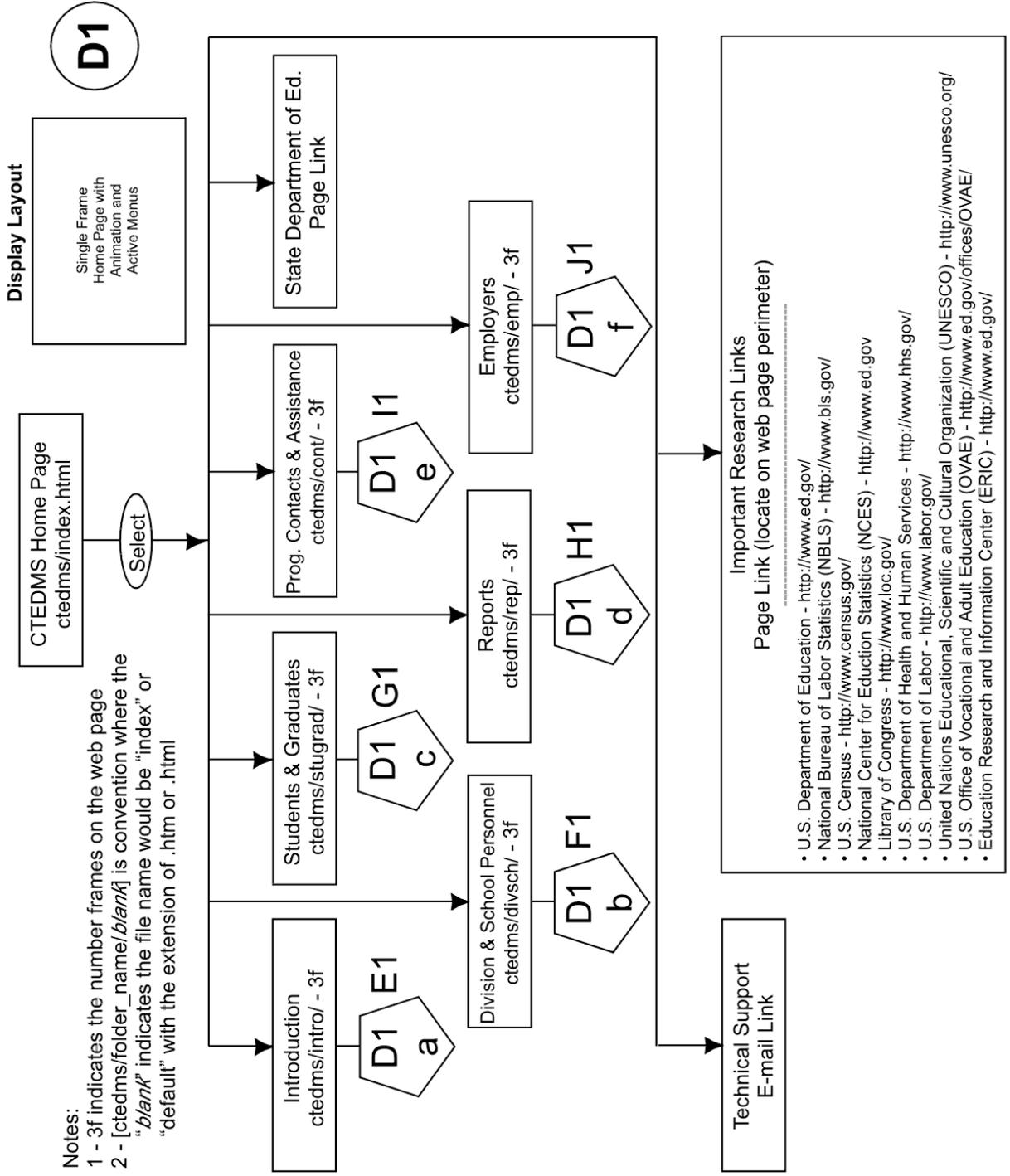
# Process Flowchart Symbology

<p>Gatekeeper Access Control System ctedms/divsch/dir/s2.htm 3f ----- • Enter e-mail address • Enter password</p>	<p>Process Operations, Addressing, Page Layout And Activities</p>	<p><b>Display Layout</b></p> <p>Web Page Display Layout Diagram</p>
<p>Secure Web Accessed Database</p>	<p>Secure Web Accessed Database</p>	<p>Non-Secure Web Accessed Database</p>
<p>forward level</p> <p>back level</p>	<p>Connection Flag Going Forward or Back Level(s) In The System Flowchart (point direction indicates process flow from source) A = Appendix Letter 1 = Flowchart Page Number a = Connection Flag Letter On The Source Page (i.e. - A1)</p>	<p>Relational Database Shown With Subordinate Databases</p>
	<p>Connection Flag With Appendix/Flowchart Page Reference (B1 - may be located in different positions around flag)</p>	<p>User Selected Function Used To Advance Through Process (mouse click button or hypertext)</p>
<p>▶◀▶▶ Process Flow Direction Arrowheads</p>		

## APPENDIX D

### CTEDMS Process Flowchart

CTEDMS Home Page  
[ctedms/index.htm](http://ctedms/index.htm)



**Notes:**

- 1 - 3f indicates the number frames on the web page
- 2 - [ctedms/folder\_name/*blank*] is convention where the "*blank*" indicates the file name would be "index" or "default" with the extension of .htm or .html

**Important Research Links**

- U.S. Department of Education
- National Bureau of Labor Statistics
- U.S. Census
- National Center for Education Statistics
- Library of Congress
- U.S. Department of Health and Human Services
- U.S. Department of Labor
- United Nations Educational, Scientific and Cultural Organization (UNESCO)
- U.S. Office of Vocational and Adult Education
- Education Research and Information Center (ERIC)

State Department of Education

Mouse click on the buttons to select.

**BULLETIN BOARD**

- Announcements
- Program Schedule Notes
- Server Maintenance/Outage
- Meetings
- Products Availability
- Data Collection/Reporting Status

[Introduction](#) | [Division & School Personnel](#) | [Students & Graduates](#) | [Reports](#) | [Program Contacts & Assistance](#)

Important Notice

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- Education Research and Information Center (ERIC)

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Mouse click on the buttons to select.

Selecting this button will provide program information to students, graduates, parents, employers, faculty and administration. The information can be used as a presentation or a self-guided activity.

**Introduction**

Division & School Personnel

Students & Graduates

Employers

Reports

**BULLETIN BOARD**

- Announcements
- Program Schedule Notes
- Server Maintenance/Outage
- Meetings
- Products Availability
- Data Collection/Reporting Status

Program Contacts & Assistance

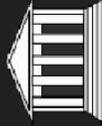
Career and Technical Education Data Management System

Introduction | Division & School Personnel | Students & Graduates | Reports | Program Contacts & Assistance

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State Department of Education

Mouse click on the buttons to select.

**Introduction**

**Division & School Personnel**

**Students & Graduates**

**Employers**

**Reports**

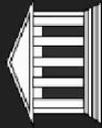
**Program Contacts & Assistance**

**BULLETIN BOARD**

- Announcements
- Program Schedule Notes
- Server Maintenance/Outage
- Meetings
- Products Availability
- Data Collection/Reporting Status

*These web pages are for employers of CTE program completers or participants. Surveys and instructions are found here.*

**State Department of Education Home Page**



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Telephone:

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- U.S. Office of Vocational and Adult Education
- Education Research and Information Center (ERIC)

State Department of Education

Mouse click on the buttons to select.

**Introduction**

**Division & School Personnel**

**Students & Graduates**

**Employers**

**Reports** Selecting this button will show you the reports available to the public.

**BULLETIN BOARD**

- Announcements
- Program Schedule Notes
- Server Maintenance/Outage Meetings
- Products Availability
- Data Collection/Reporting Status

**Program Contacts & Assistance**

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**Division and School Personnel**

**Reports (Main Menu Item)**

There are two types of reports available using this feature. The two report types are:

- **Standard Reports** - aggregated reports generated by the databases within the CTEDMS that are presented annually and uniformly to all interested parties and agencies. Many of these reports are designed to satisfy federal, state, and local requirements.
- **Special Reports** - These reports are developed by designated individuals by querying the CTEDMS for data characteristics of interest. This feature can be used to support school board meetings and similar activities. The people that use this feature should practice good data comparison and contrasting analysis. Any questions regarding the compilation and analysis of data, please contact our technical support group (see contact information at the top of this page or go to the Program Contacts and Assistance web pages).

**Frame 3**

**Activity Content**

**Program Contacts and Assistance (Main Menu Item)**

Use this feature to contact CTEDMS administrative, data management, and technical support (hardware/software) groups.

Mouse click on the activity/product (blue text) below to select. You can return to this page at anytime by mouse clicking on the yellow "Division and School Personnel" button in the left menu bar.

Activity/Product	Secure Site	Restricted Access
<u><a href="#">Gatekeeper Access Control System</a></u>		
<u><a href="#">Software Downloads</a></u>	-	
<u><a href="#">Data Collection and Reporting Status</a></u>		
<u><a href="#">Reports (Main Menu Item)</a></u>	-	some reports
<u><a href="#">Program Contacts and Assistance (Main Menu Item)</a></u>	-	-

If you want to return to the home page, mouse click on the Career and Technical Education Data Management System icon located at the top of the left menu bar.

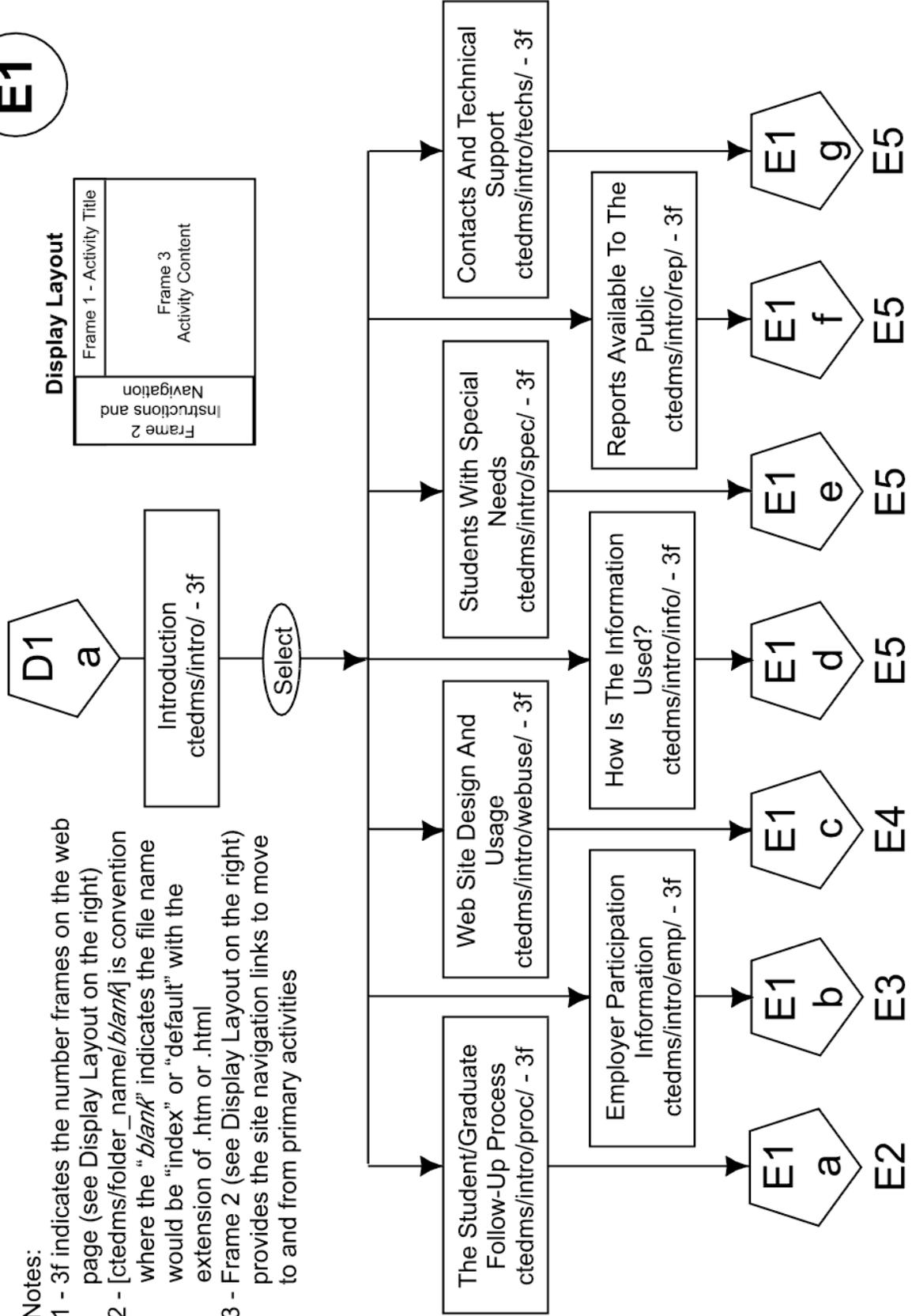
## APPENDIX E

### CTEDMS Process Flowchart

Introduction  
[ctedms/intro/](#)

**E1**

- Notes:
- 1 - 3f indicates the number frames on the web page (see Display Layout on the right)
  - 2 - [ctedms/folder\_name/*blank*] is convention where the "*blank*" indicates the file name would be "index" or "default" with the extension of .htm or .html
  - 3 - Frame 2 (see Display Layout on the right) provides the site navigation links to move to and from primary activities



**Display Layout**



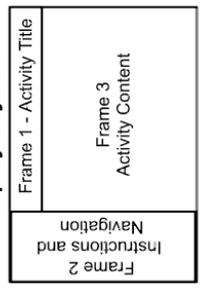
**E2**

**E1**  
a

**Notes:**

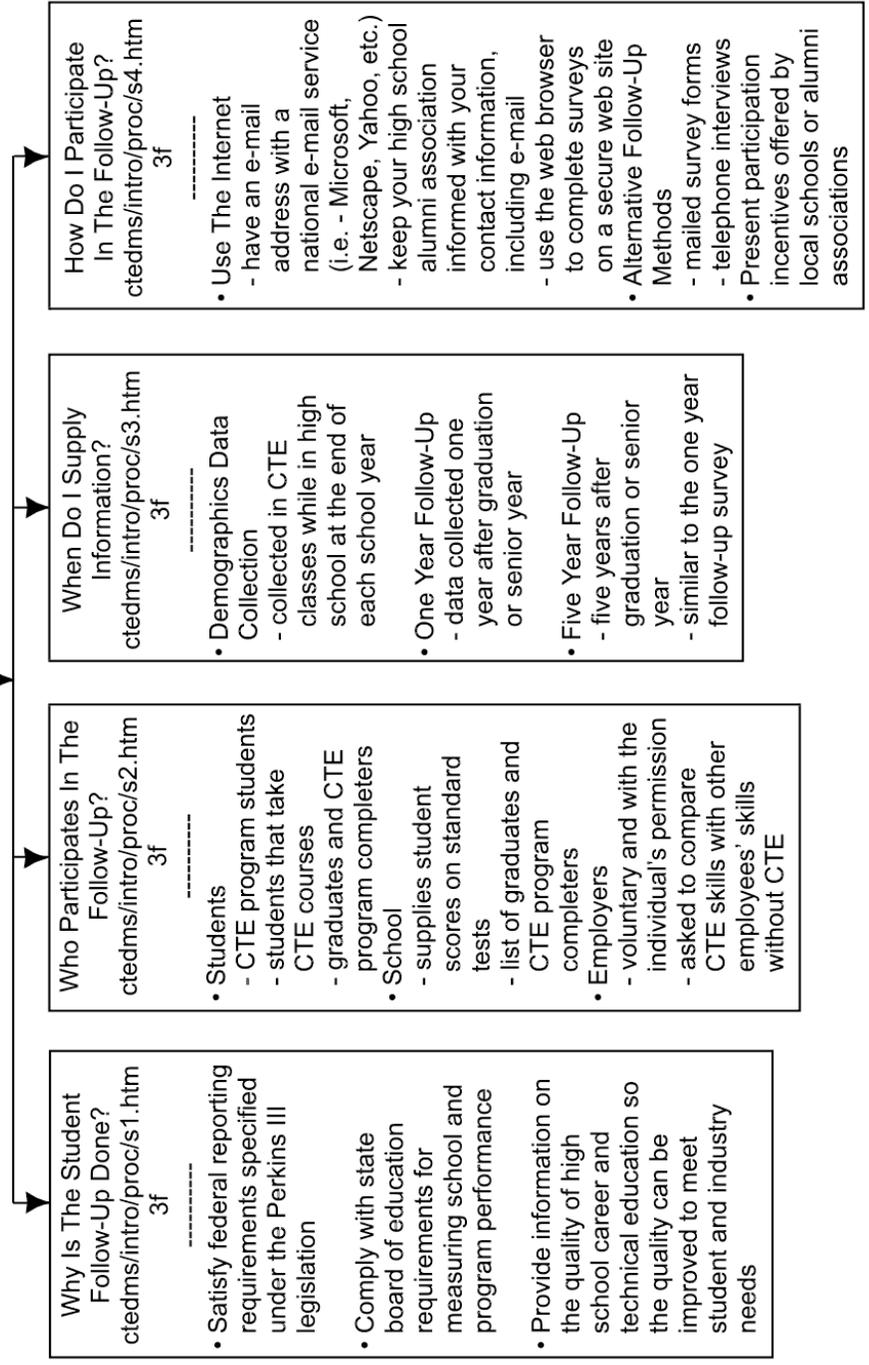
- 1 - 3f indicates the number frames on the web page (see Display Layout on the right)
- 2 - CTE is the acronym for Career and Technical Education (secondary)
- 3 - Frame 2 (see Display Layout on the right) provides the site navigation links to move to and from primary activities

**Display Layout**



The Student/Graduate Follow-Up Process  
ctedms/intro/proc/- 3f

Select



**Why Is The Student Follow-Up Done?**  
ctedms/intro/proc/s1.htm  
3f

- Satisfy federal reporting requirements specified under the Perkins III legislation
- Comply with state board of education requirements for measuring school and program performance
- Provide information on the quality of high school career and technical education so the quality can be improved to meet student and industry needs

**Who Participates In The Follow-Up?**  
ctedms/intro/proc/s2.htm  
3f

- Students
  - CTE program students
  - students that take CTE courses
  - graduates and CTE program completers
- School
  - supplies student scores on standard tests
  - list of graduates and CTE program completers
- Employers
  - voluntary and with the individual's permission
  - asked to compare CTE skills with other employees' skills without CTE

**When Do I Supply Information?**  
ctedms/intro/proc/s3.htm  
3f

- Demographics Data Collection
  - collected in CTE classes while in high school at the end of each school year
- One Year Follow-Up
  - data collected one year after graduation or senior year
- Five Year Follow-Up
  - five years after graduation or senior year
  - similar to the one year follow-up survey

**How Do I Participate In The Follow-Up?**  
ctedms/intro/proc/s4.htm  
3f

- Use The Internet
  - have an e-mail address with a national e-mail service (i.e. - Microsoft, Netscape, Yahoo, etc.)
  - keep your high school alumni association informed with your contact information, including e-mail
  - use the web browser to complete surveys on a secure web site
- Alternative Follow-Up Methods
  - mailed survey forms
  - telephone interviews
- Present participation incentives offered by local schools or alumni associations

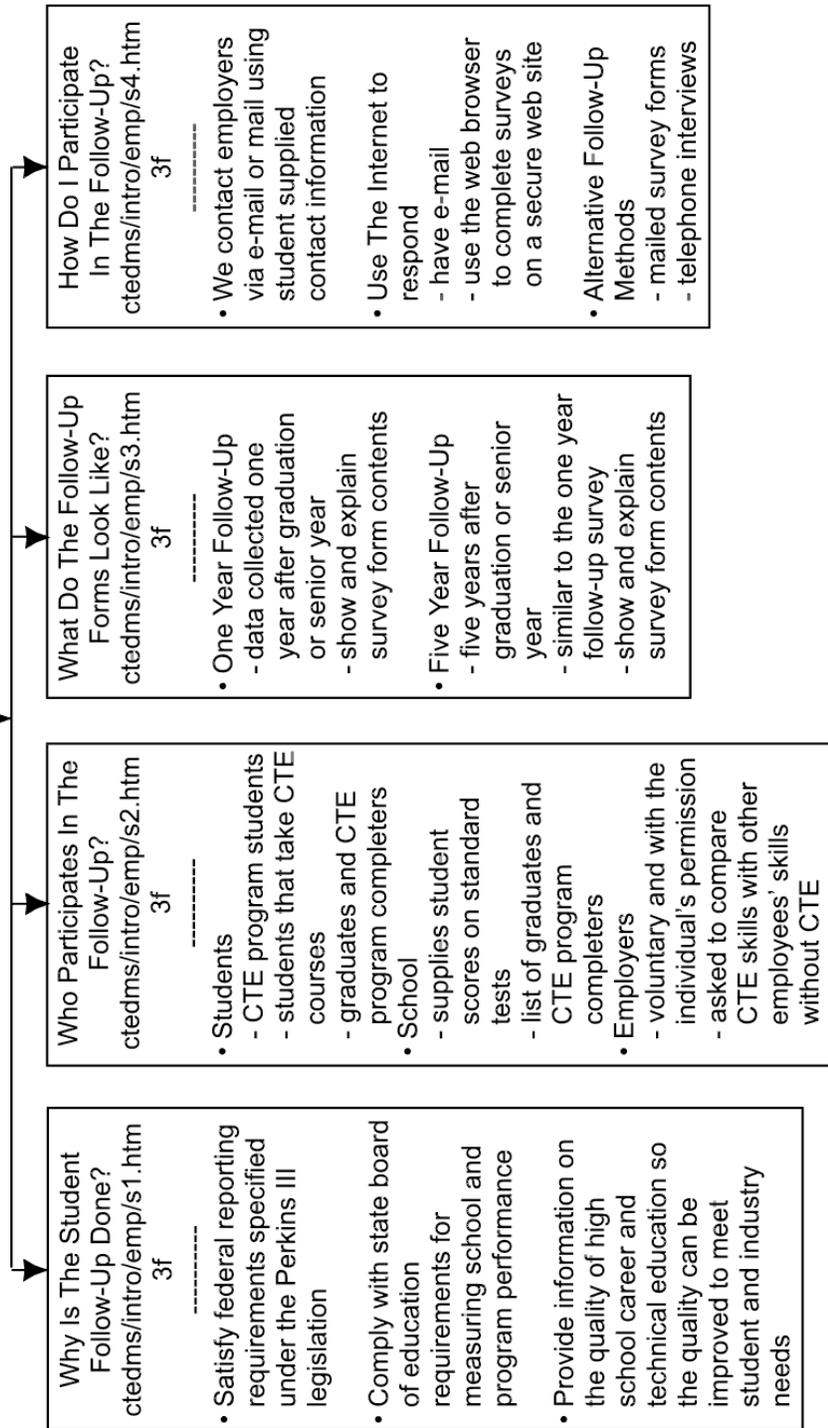
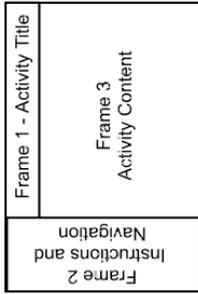
**E3**

**E1  
b**

**Notes:**

- 1 - 3f indicates the number frames on the web page (see Display Layout on the right)
- 2 - CTE is the acronym for Career and Technical Education (secondary)
- 3 - Frame 2 (see Display Layout on the right) provides the site navigation links to move to and from primary activities

**Display Layout**



**Why Is The Student Follow-Up Done?**  
ctedms/intro/emp/s1.htm  
3f

- Satisfy federal reporting requirements specified under the Perkins III legislation
- Comply with state board of education requirements for measuring school and program performance
- Provide information on the quality of high school career and technical education so the quality can be improved to meet student and industry needs

**Who Participates In The Follow-Up?**  
ctedms/intro/emp/s2.htm  
3f

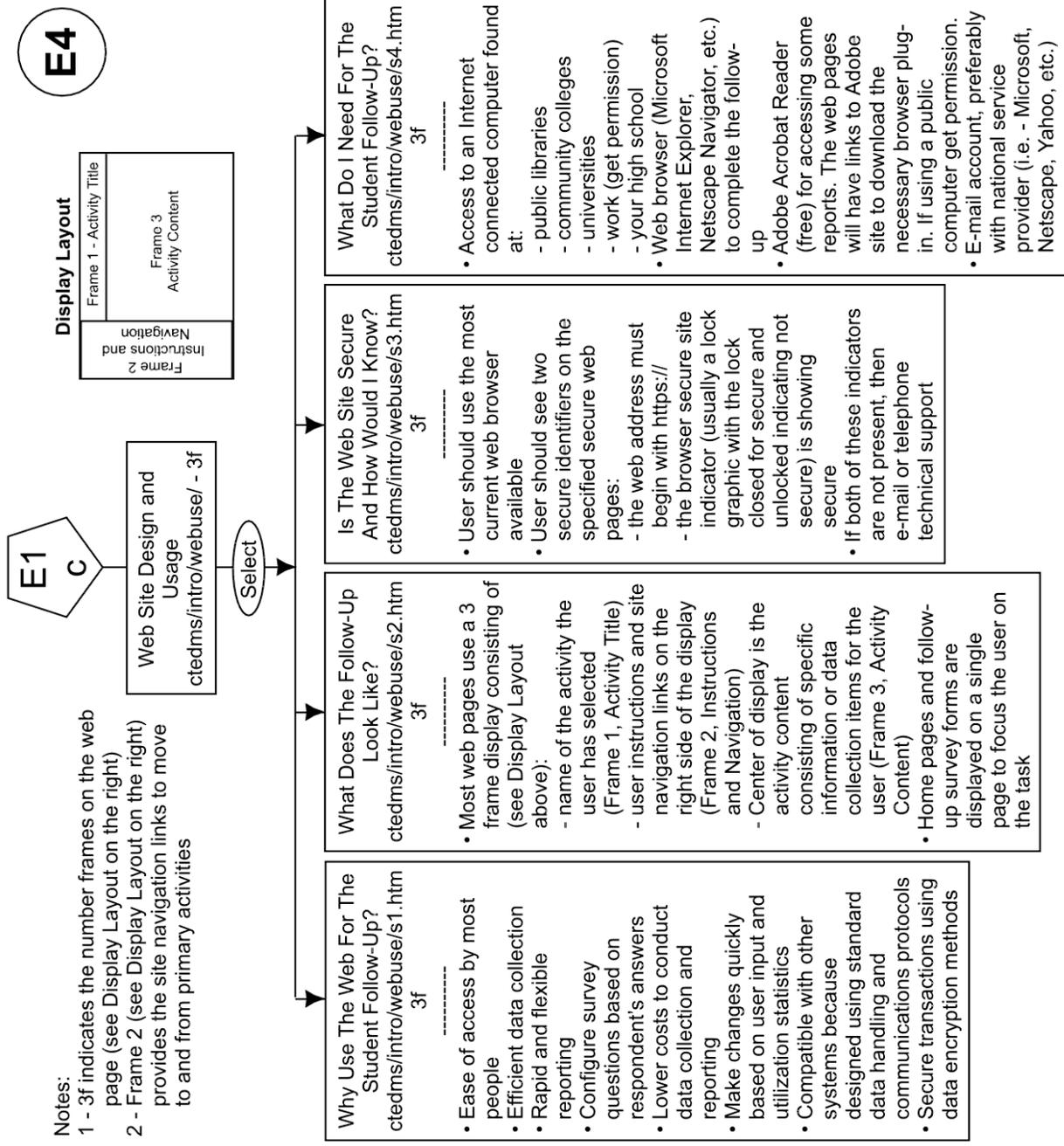
- Students
  - CTE program students
  - students that take CTE courses
  - graduates and CTE program completers
- School
  - supplies student scores on standard tests
  - list of graduates and CTE program completers
- Employers
  - voluntary and with the individual's permission
  - asked to compare CTE skills with other employees' skills without CTE

**What Do The Follow-Up Forms Look Like?**  
ctedms/intro/emp/s3.htm  
3f

- One Year Follow-Up
  - data collected one year after graduation or senior year
  - show and explain survey form contents
- Five Year Follow-Up
  - five years after graduation or senior year
  - similar to the one year follow-up survey
  - show and explain survey form contents

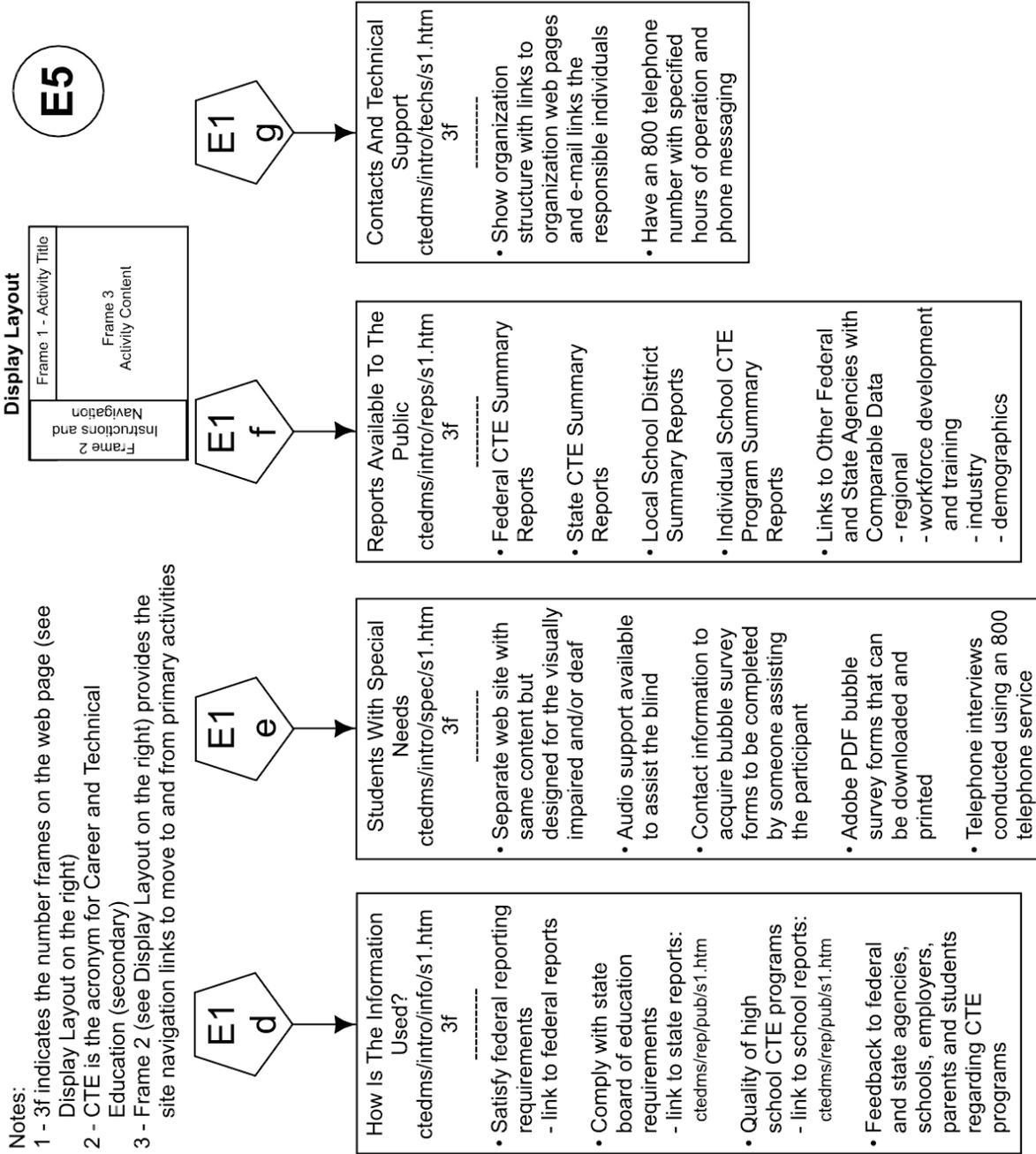
**How Do I Participate In The Follow-Up?**  
ctedms/intro/emp/s4.htm  
3f

- We contact employers via e-mail or mail using student supplied contact information
- Use The Internet to respond
  - have e-mail
  - use the web browser to complete surveys on a secure web site
- Alternative Follow-Up Methods
  - mailed survey forms
  - telephone interviews



Notes:

- 1 - 3f indicates the number frames on the web page (see Display Layout on the right)
- 2 - Frame 2 (see Display Layout on the right) provides the site navigation links to move to and from primary activities



## APPENDIX F

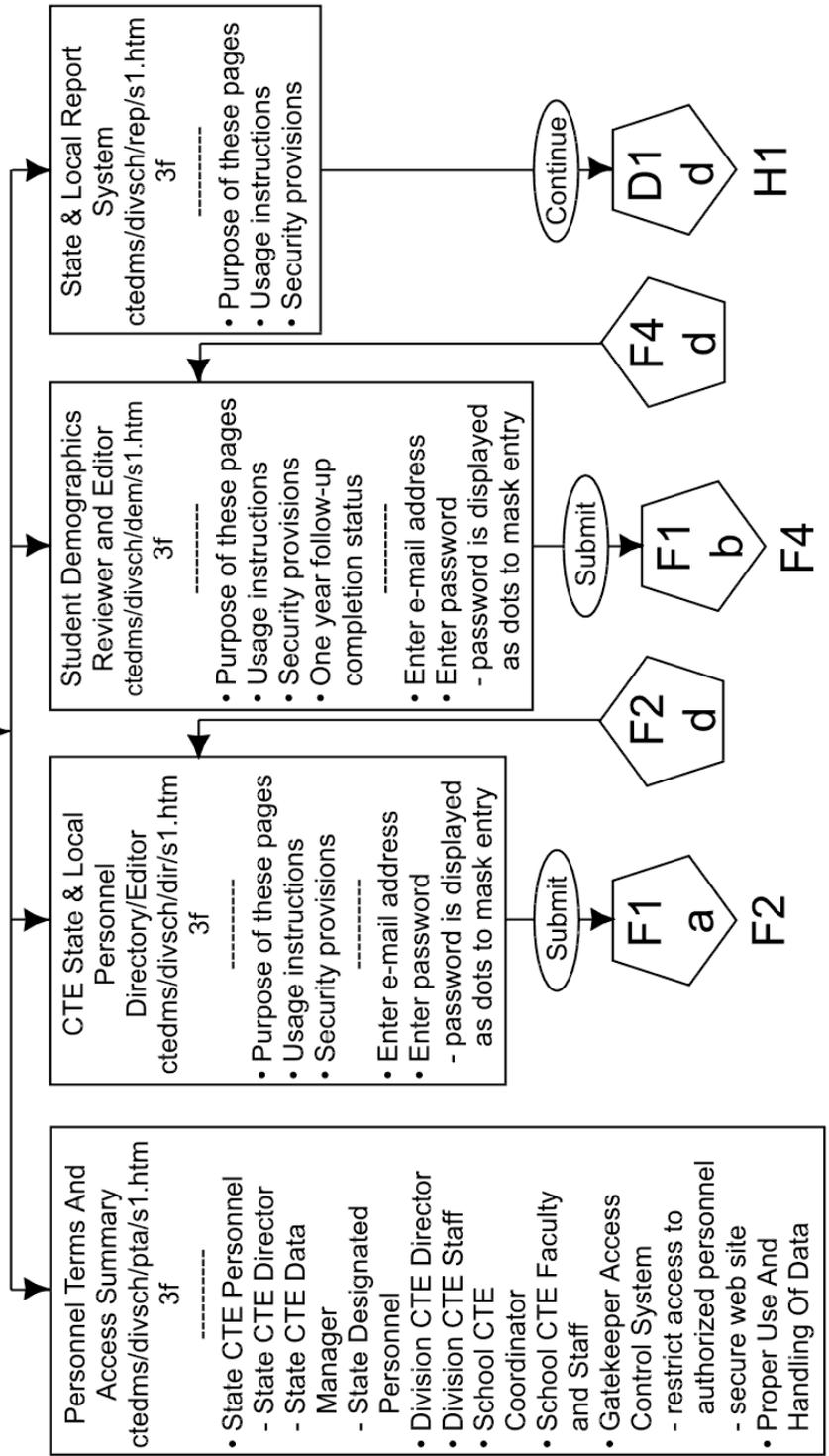
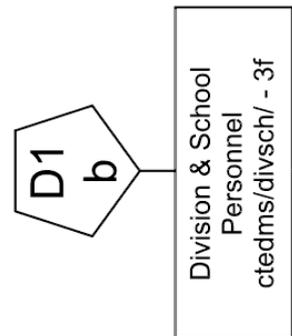
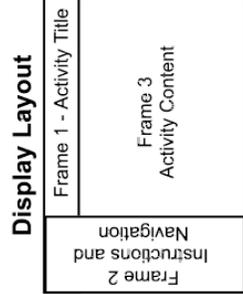
### CTEDMS Process Flowchart

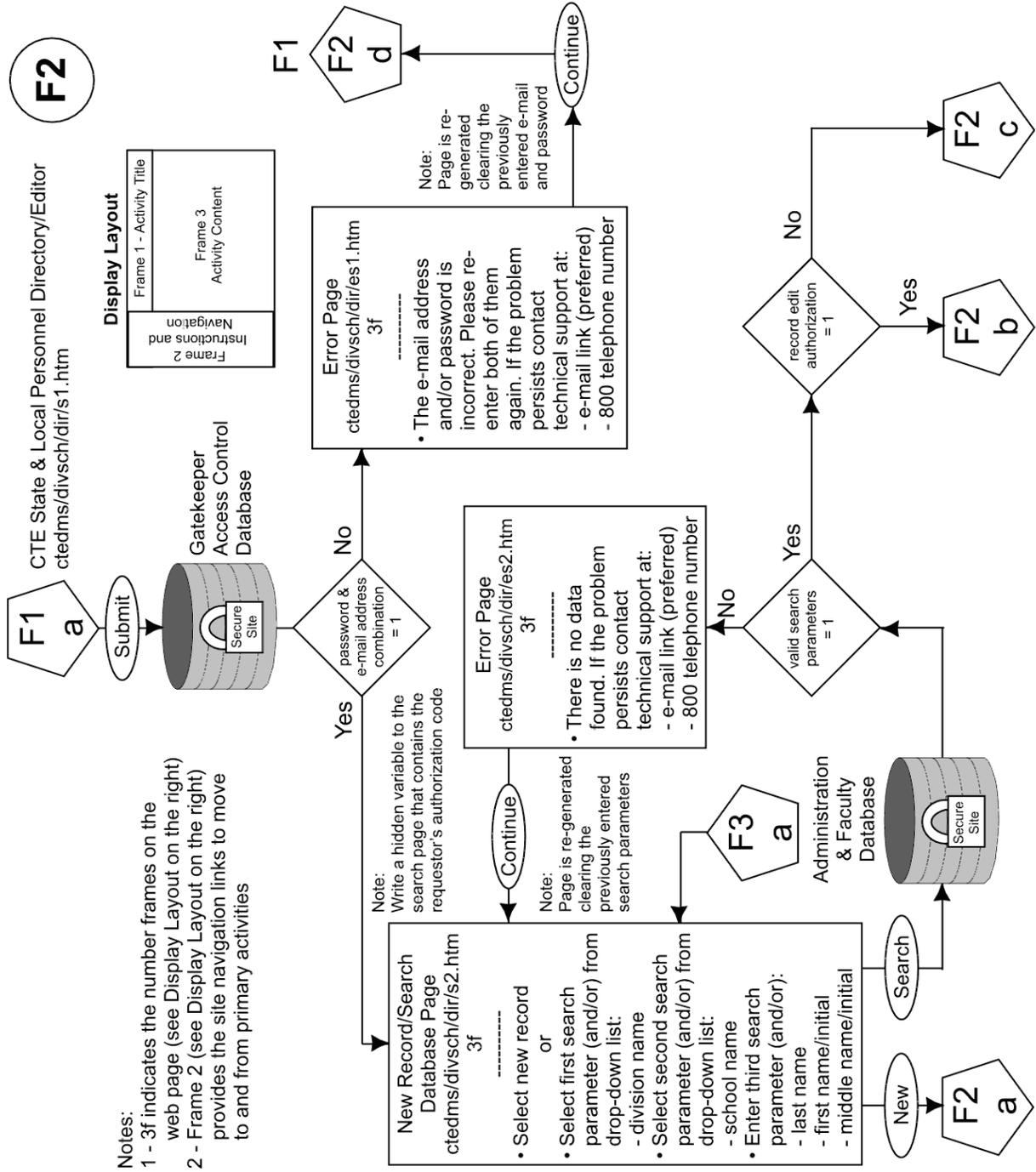
Division and School Personnel  
[ctedms/divsch/](#)

**F1**

**Notes:**

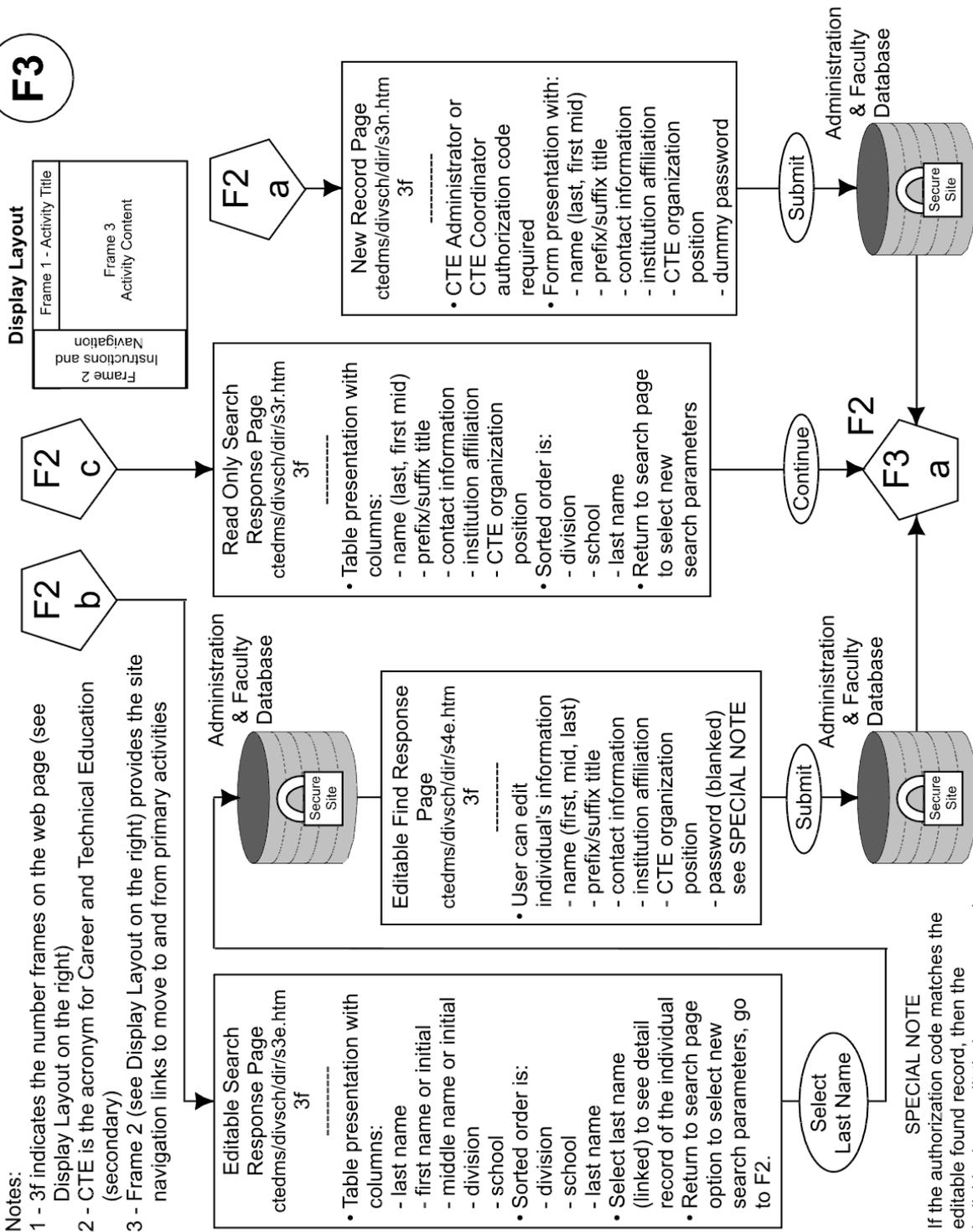
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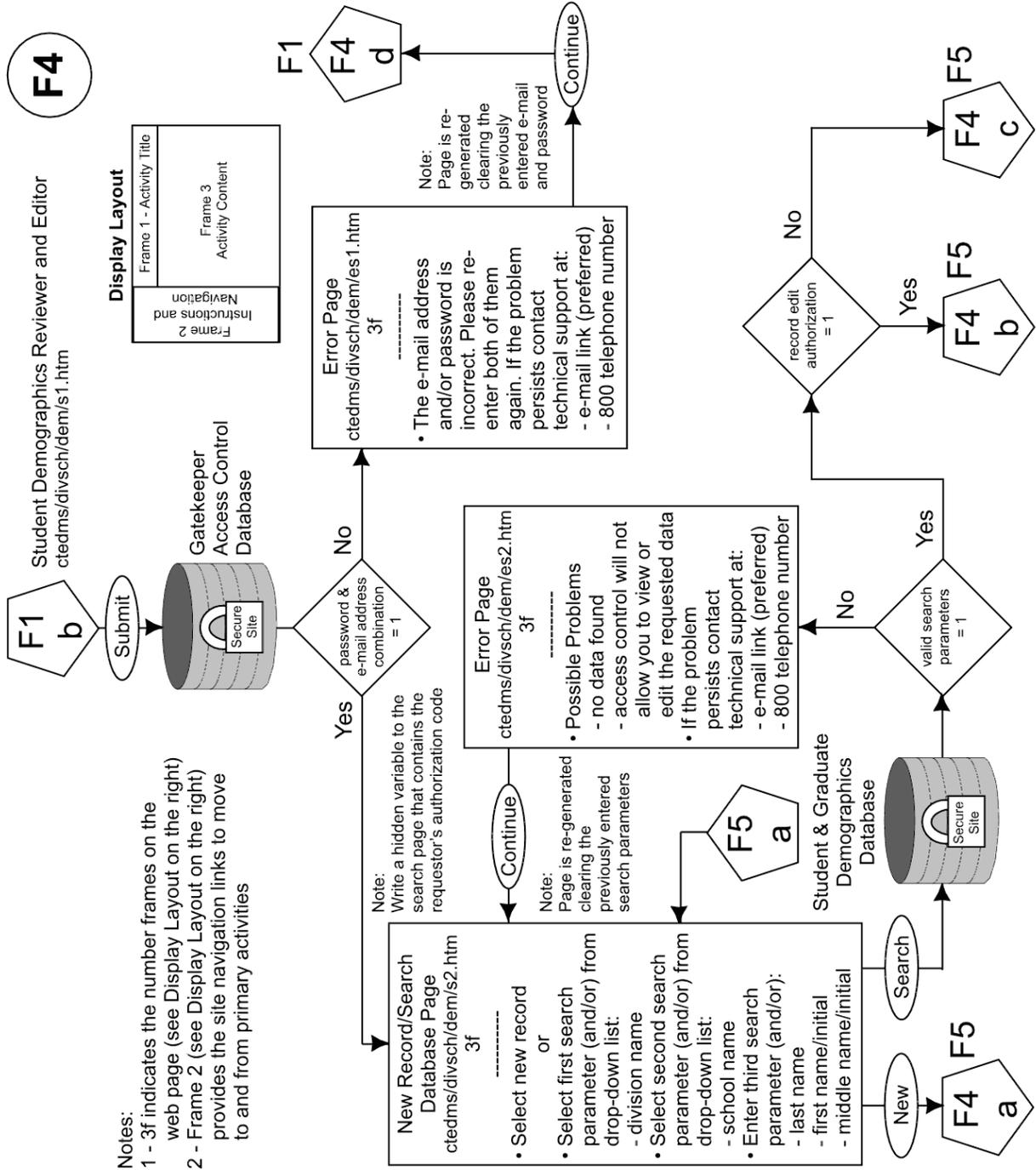


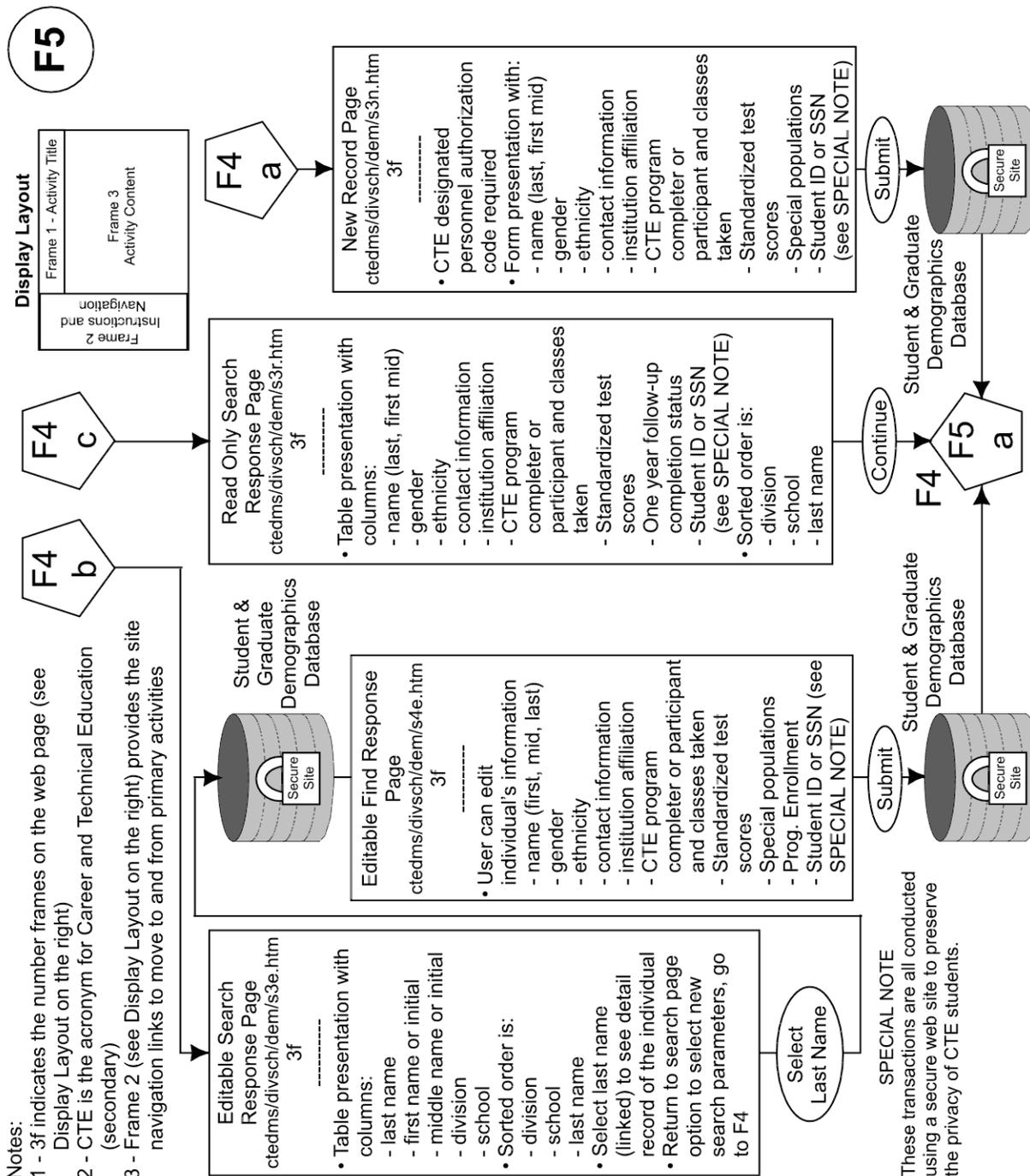


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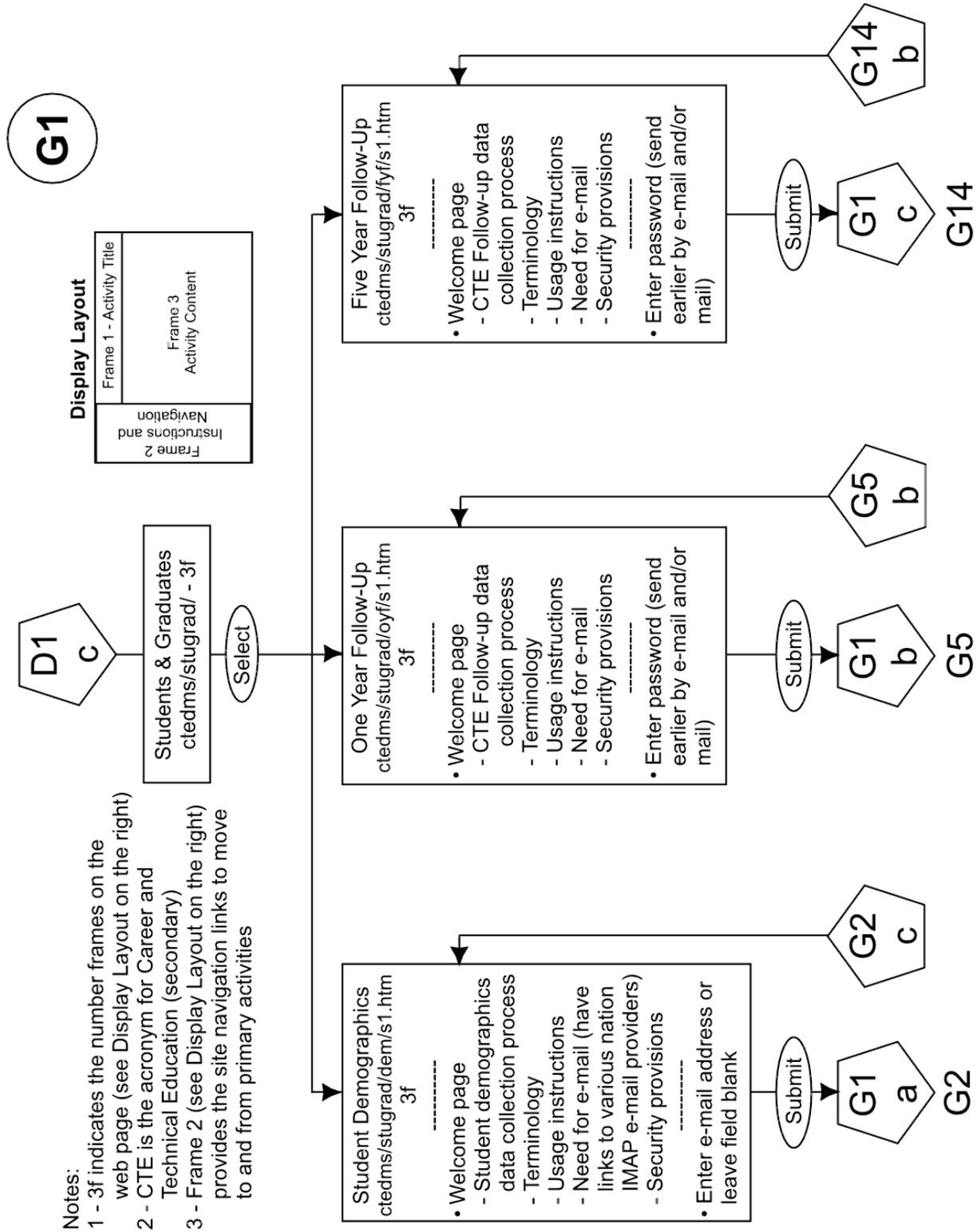


## APPENDIX G

### CTEDMS Process Flowchart

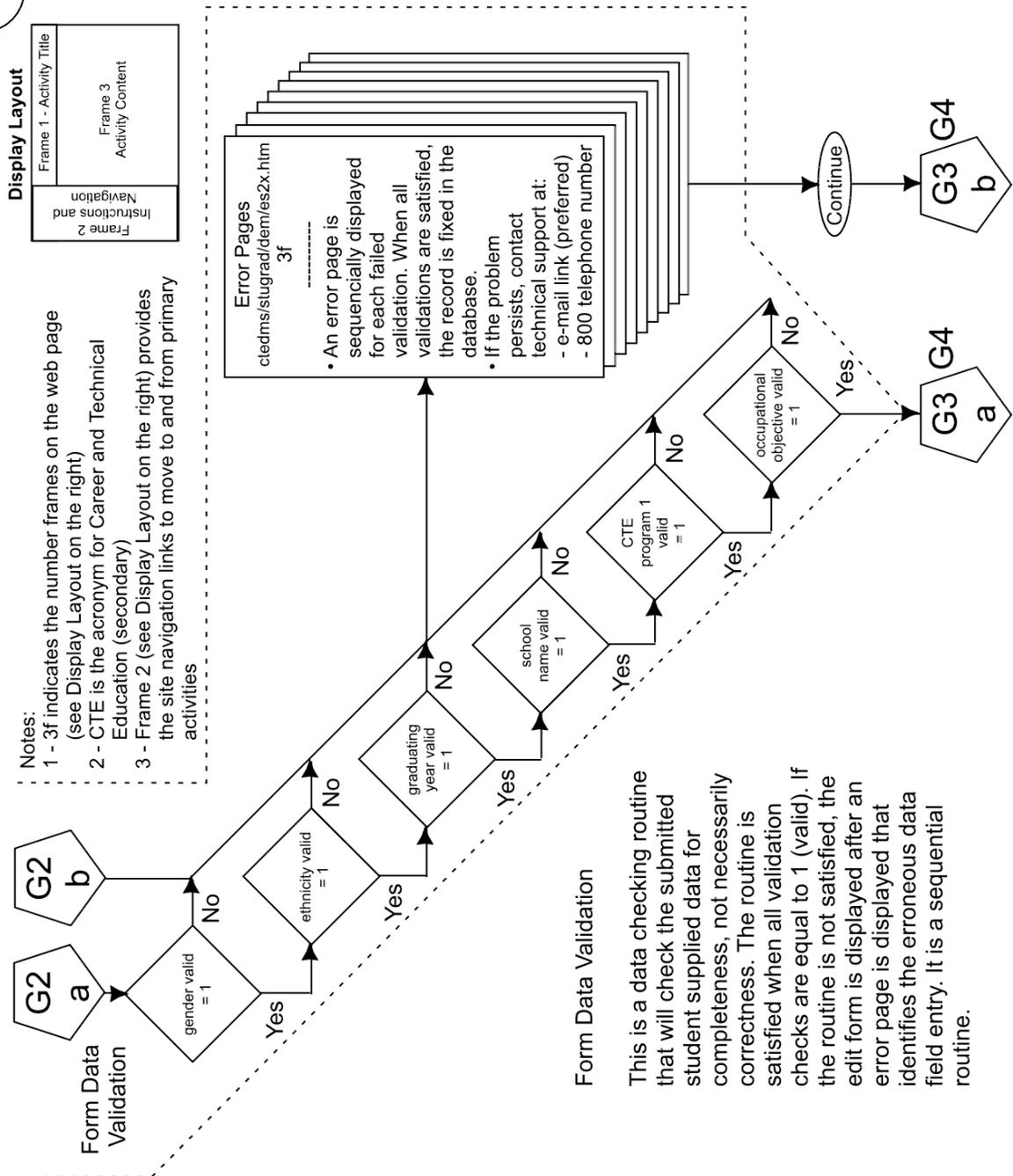
Students and Graduates

[ctedms/stugrad/](#)





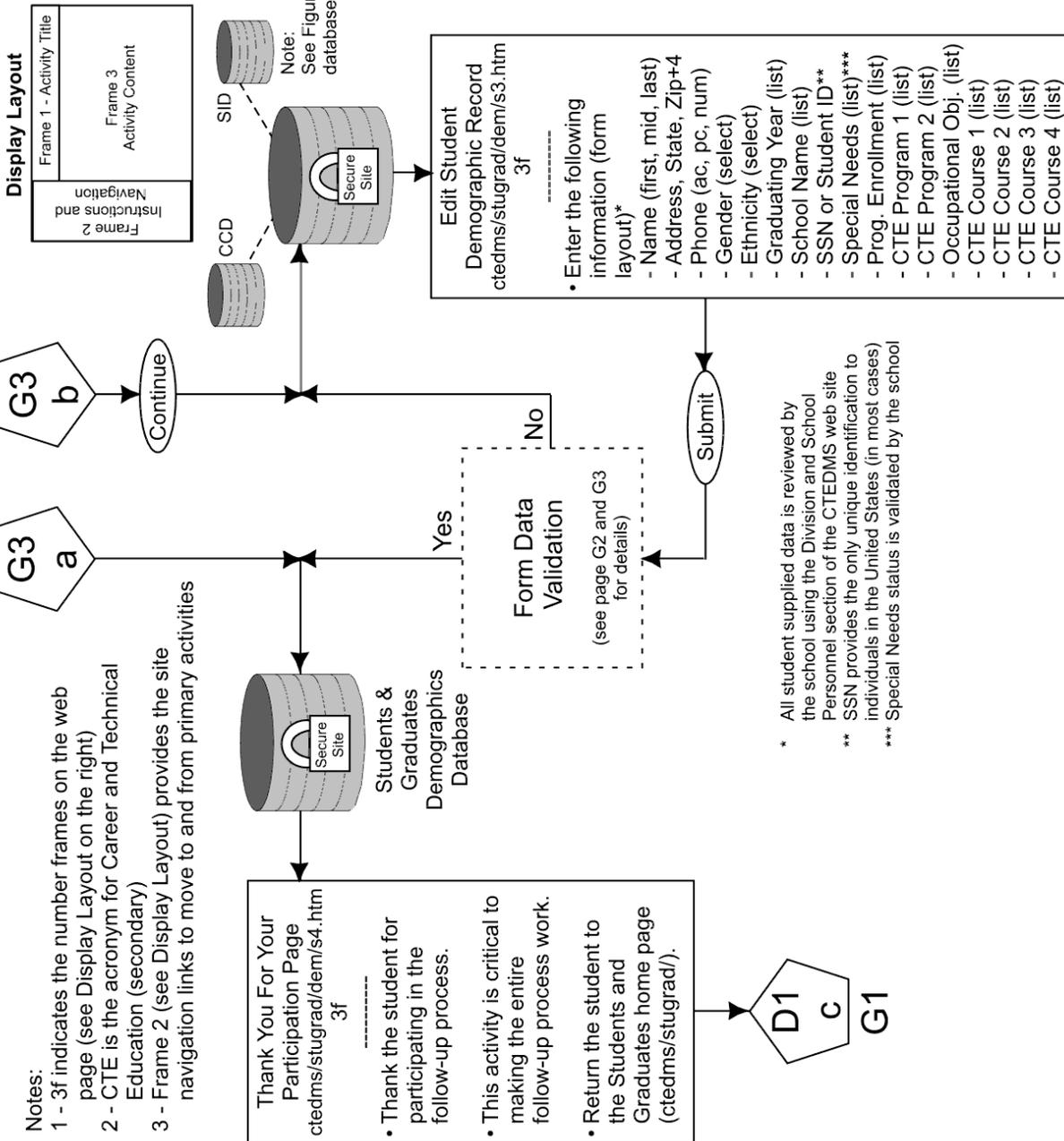
**G3**



**G4**

**Notes:**

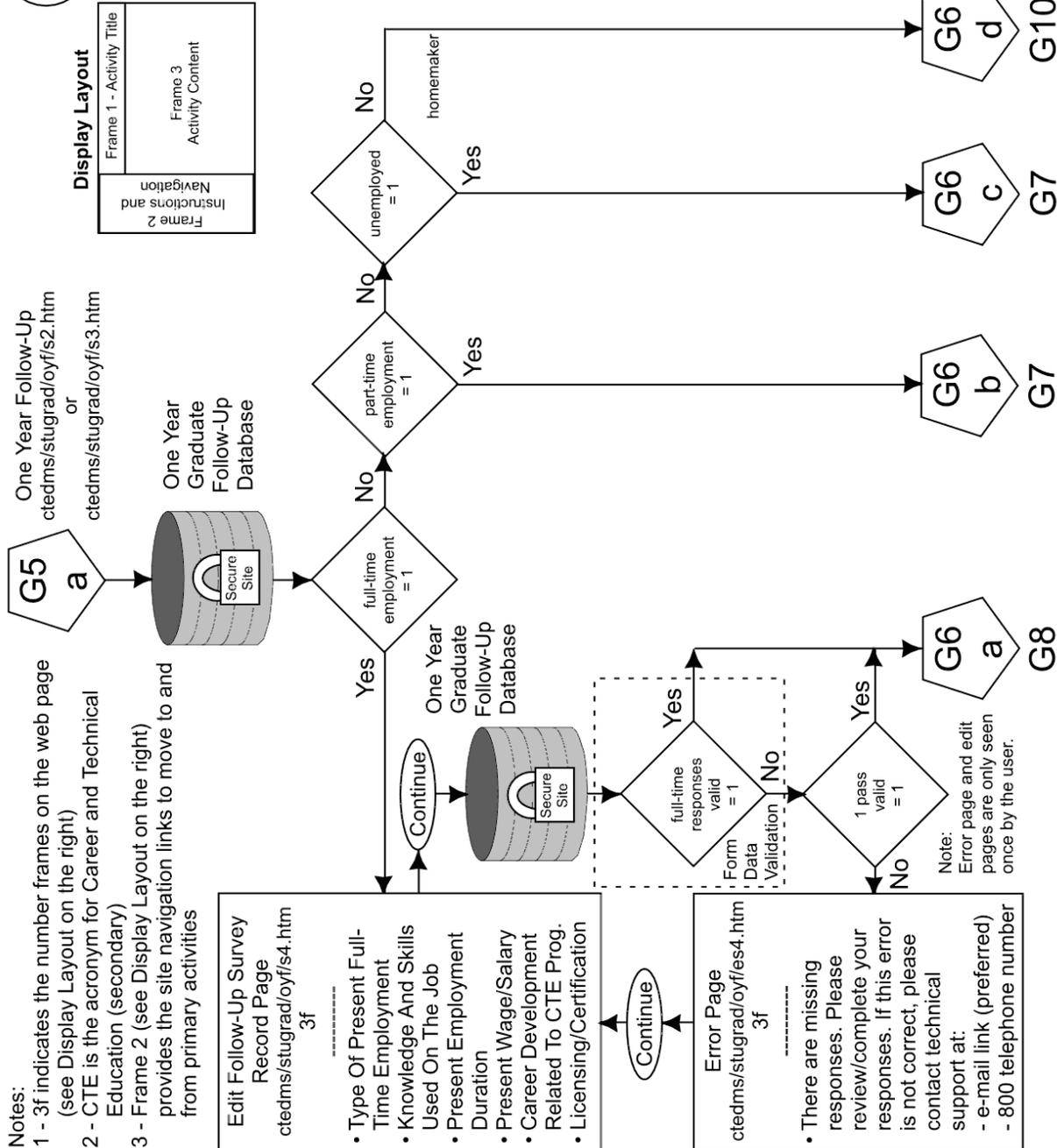
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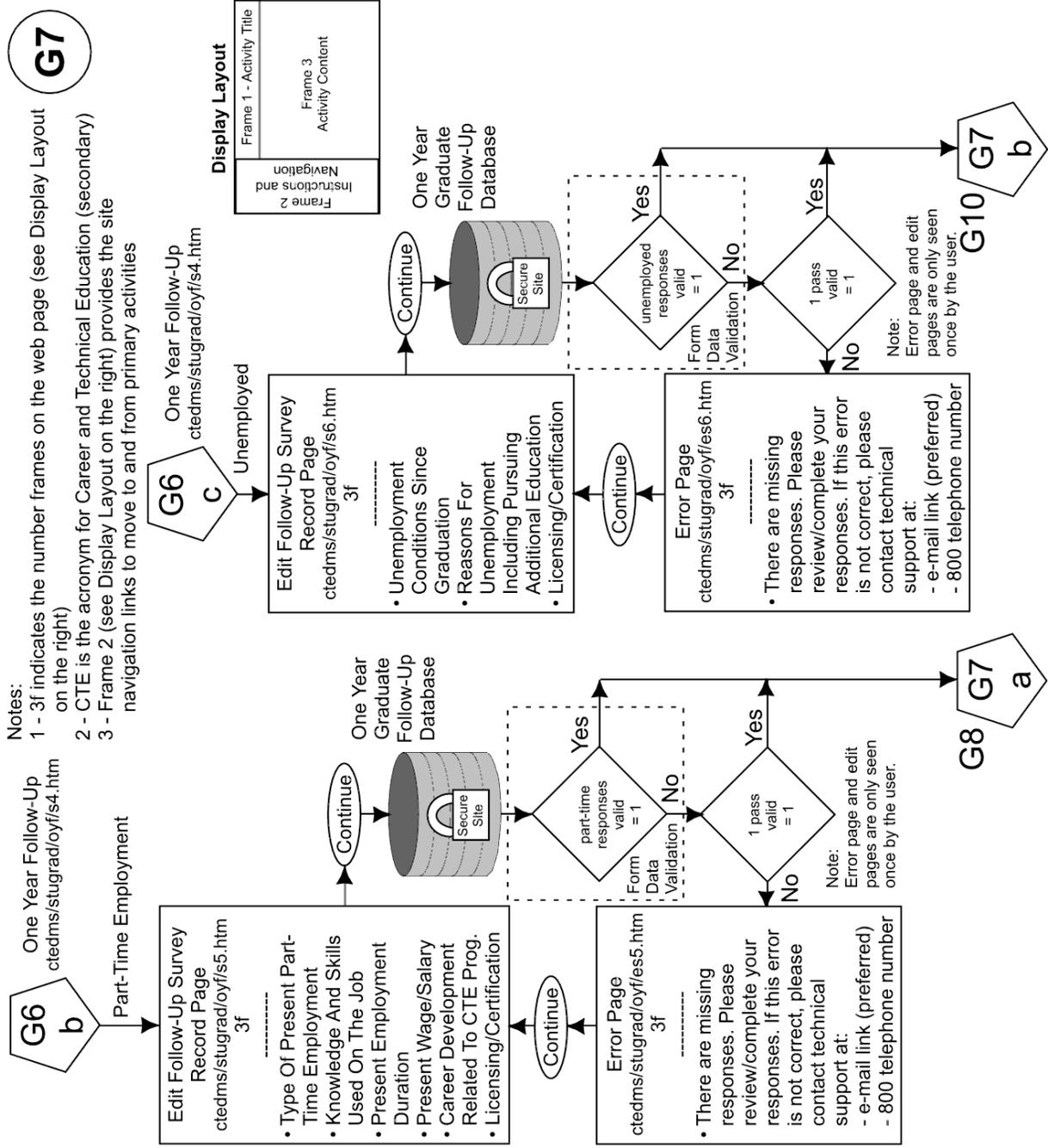


\* All student supplied data is reviewed by the school using the Division and School Personnel section of the CTEDMS web site  
 \*\* SSN provides the only unique identification to individuals in the United States (in most cases)  
 \*\*\* Special Needs status is validated by the school



**G6**





**G7**

**G6 b**

**G8 G7 a**

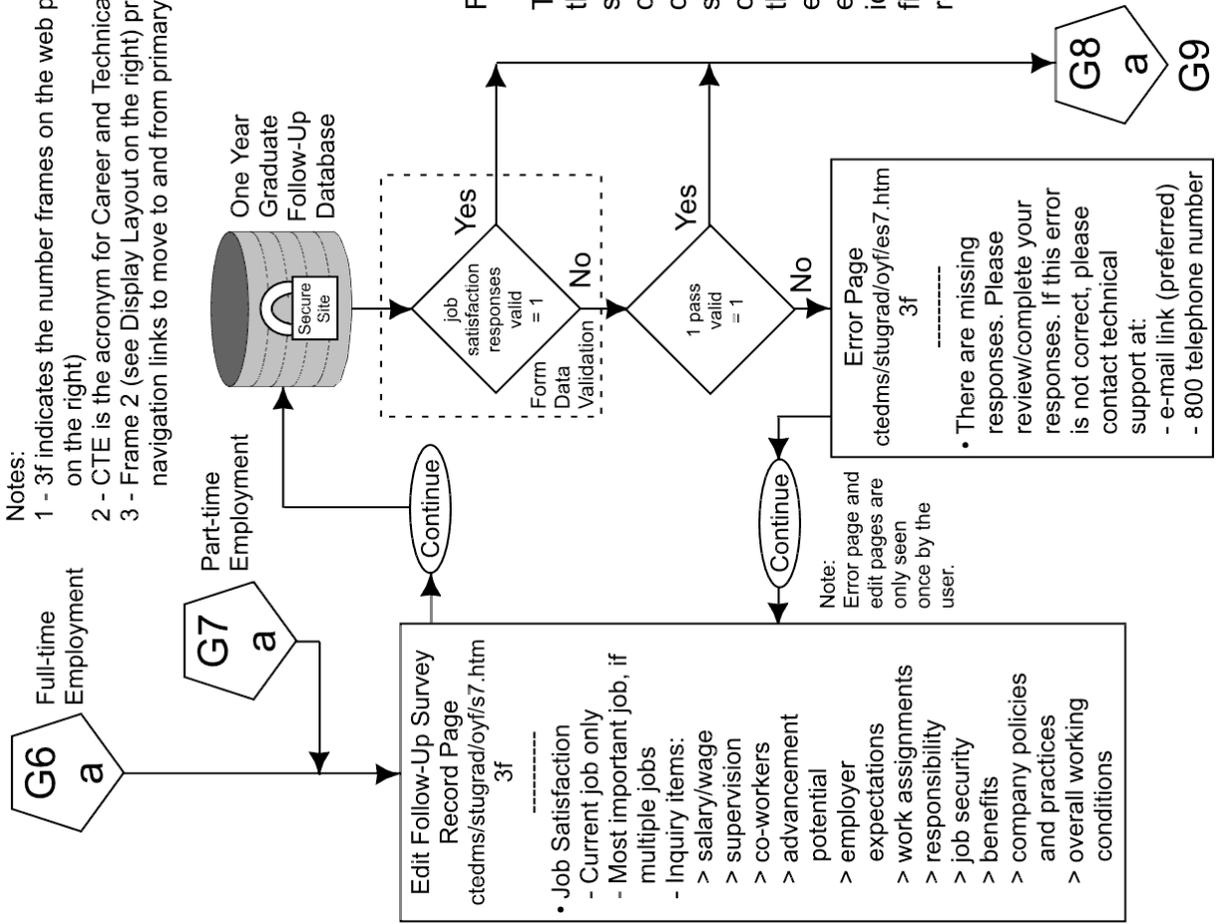
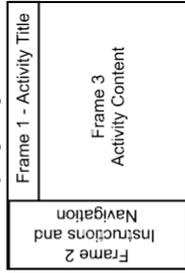
**G6 c**

**G10 G7 b**

**G8**

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**Display Layout**



**Form Data Validation**

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Note:  
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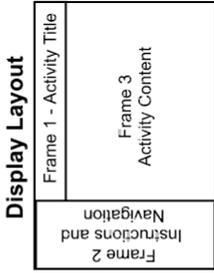
• There are missing responses. Please review/complete your responses. If this error is not correct, please contact technical support at:  
 - e-mail link (preferred)  
 - 800 telephone number

**Edit Follow-Up Survey Record Page**  
 ctedms/stugrad/oyf/s7.htm  
 3f

- Job Satisfaction
- Current job only
- Most important job, if multiple jobs
- Inquiry items:
  - > salary/wage
  - > supervision
  - > co-workers
  - > advancement potential
  - > employer expectations
  - > work assignments
  - > responsibility
  - > job security
  - > benefits
  - > company policies and practices
  - > overall working conditions

**G9**

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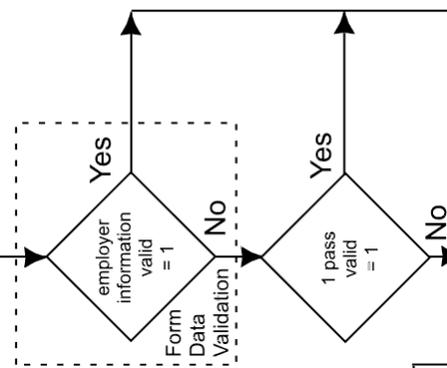
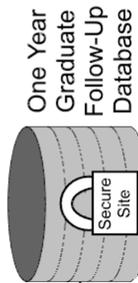


**G8** Job Satisfaction

Edit Follow-Up Survey Record Page  
ctedms/stugrad/oy/fs8.htm  
3f

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- Preface Statement
- Employers provide valuable feedback to assist in improving CTE programs. The goal is to get their suggestions on specific areas that CTE programs can better prepare students for work.
- Employer Information
  - Employer name
  - Employer address
  - Employer/supervisor telephone number
  - Supervisor name
  - Your job title
- Can we contact your employer to get his/her opinion on how to improve high school CTE programs? (yes/no)



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Error Page  
ctedms/stugrad/oy/es8.htm  
3f

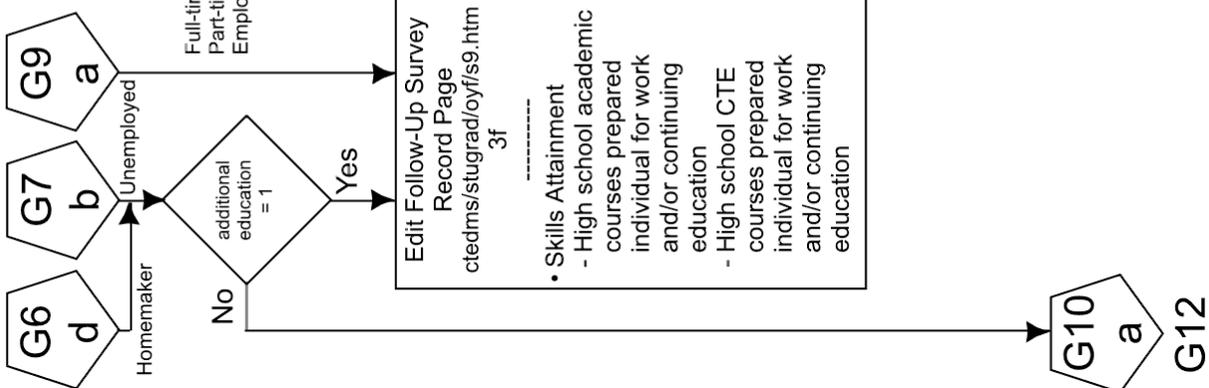
-----

- There are missing responses. Please review/complete your responses. If this error is not correct, please contact technical support at:
  - e-mail link (preferred)
  - 800 telephone number

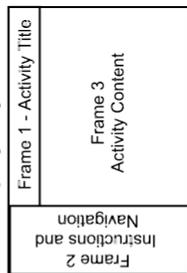
**G9 a**  
**G10**

**G10**

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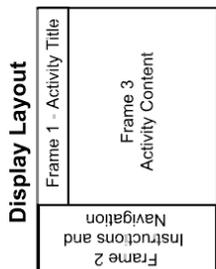
G11



G12

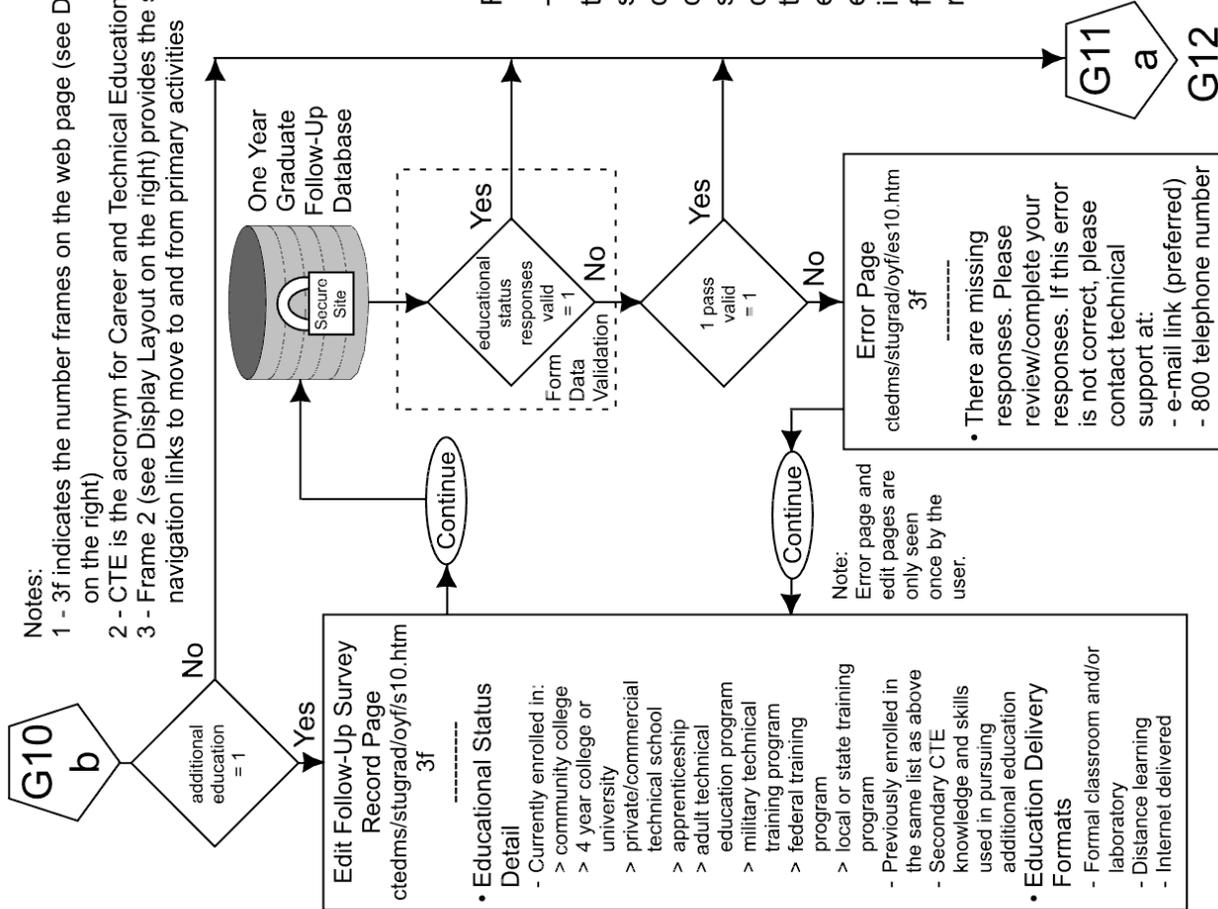
**G11**

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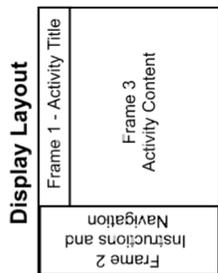


**G11 a**

**G12**

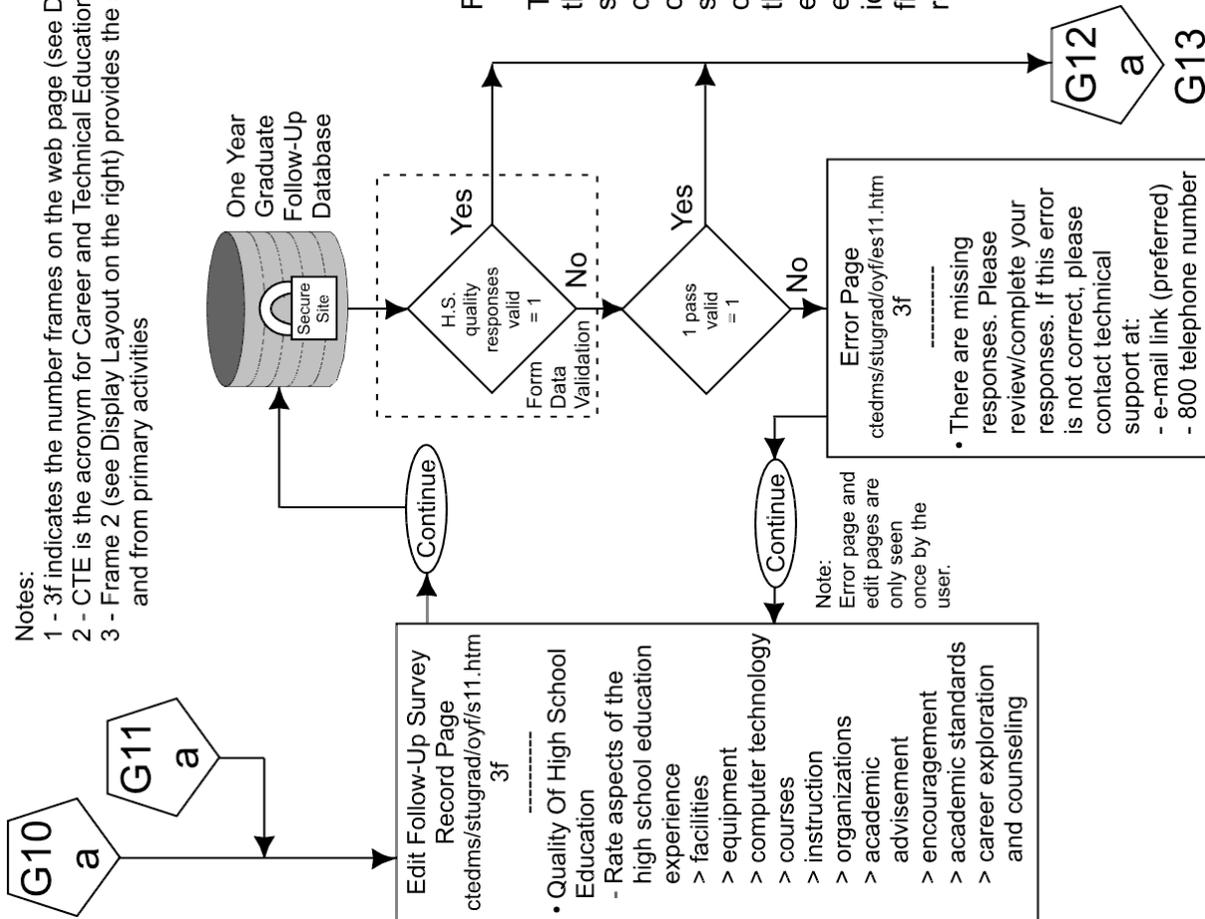
**G12**

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**G12 a**

**G13**

**G13**

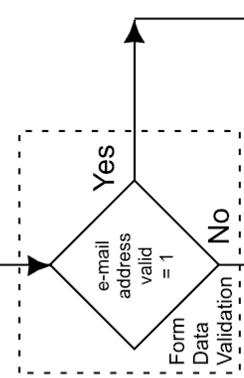
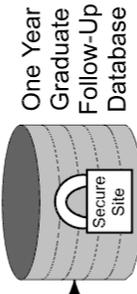
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**G12 a**

**Edit Follow-Up Survey Record Page**  
 ctedms/stugrad/oyf/s12.htm  
 3f

- Enter current and preferred e-mail address
- Thank the individual for participating in the follow-up process.
- This activity is critical to making the entire follow-up process work.
- Set "completed survey" to 1 this will not let the password to take the survey again
- Return the student to the Students and Graduates home page (ctedms/stugrad/



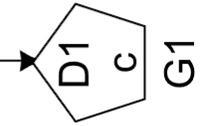
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**Error Page**  
 ctedms/stugrad/oyf/es12.htm  
 3f

- The e-mail address is not correct. Please review/complete your responses. If this error is not correct, please contact technical support at:  
 - e-mail link (preferred)  
 - 800 telephone number

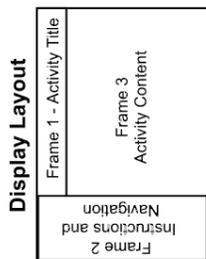
Note:  
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**G14**

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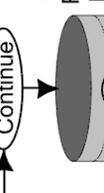
Five Year Follow-Up  
ctedms/stugrad/fy/f/s1.htm



Note:  
Five year follow-up password is sent to CTE program completers/participants using e-mail and/or mail. All participants must complete the follow-up in one sitting.



Five Year Graduate Follow-Up Database



New Follow-Up Survey Record Page  
ctedms/stugrad/fy/f/s2.htm  
3f

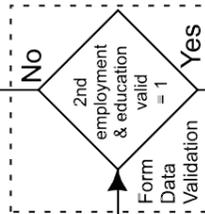
- Current Employment Status Selection
  - Full-time
    - > a single job
    - > more than 32 hours/week
    - > includes military or volunteer service
    - > Homemaker
    - Part-time
      - > single job or multiple jobs
      - > each job is less than or equal to 32 hours/week
      - > includes military or volunteer service
    - Unemployed
      - > no employment or military or volunteer service
      - > full-time student with no job
  - Educational Status Selection
    - Have you enrolled in any education/training program since leaving high school? (yes/no)

Error Page  
ctedms/stugrad/fy/f/s2.htm  
3f

- The password is incorrect or you have completed the survey already. Please re-enter your password. If this error is not correct, please contact technical support at:
  - e-mail link (preferred)
  - 800 telephone number

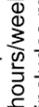
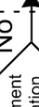
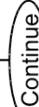
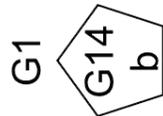
Note:  
Page is re-generated clearing the previously entered password

Note:  
Edit page contains the previously entered data and all data can be changed. If validation is not satisfied, the edit page is displayed until data is completed. The user can leave but the record will be deleted and the user can return to complete the survey again using the assigned password.



Edit Follow-Up Survey Record Page  
ctedms/stugrad/fy/f/s3.htm  
3f

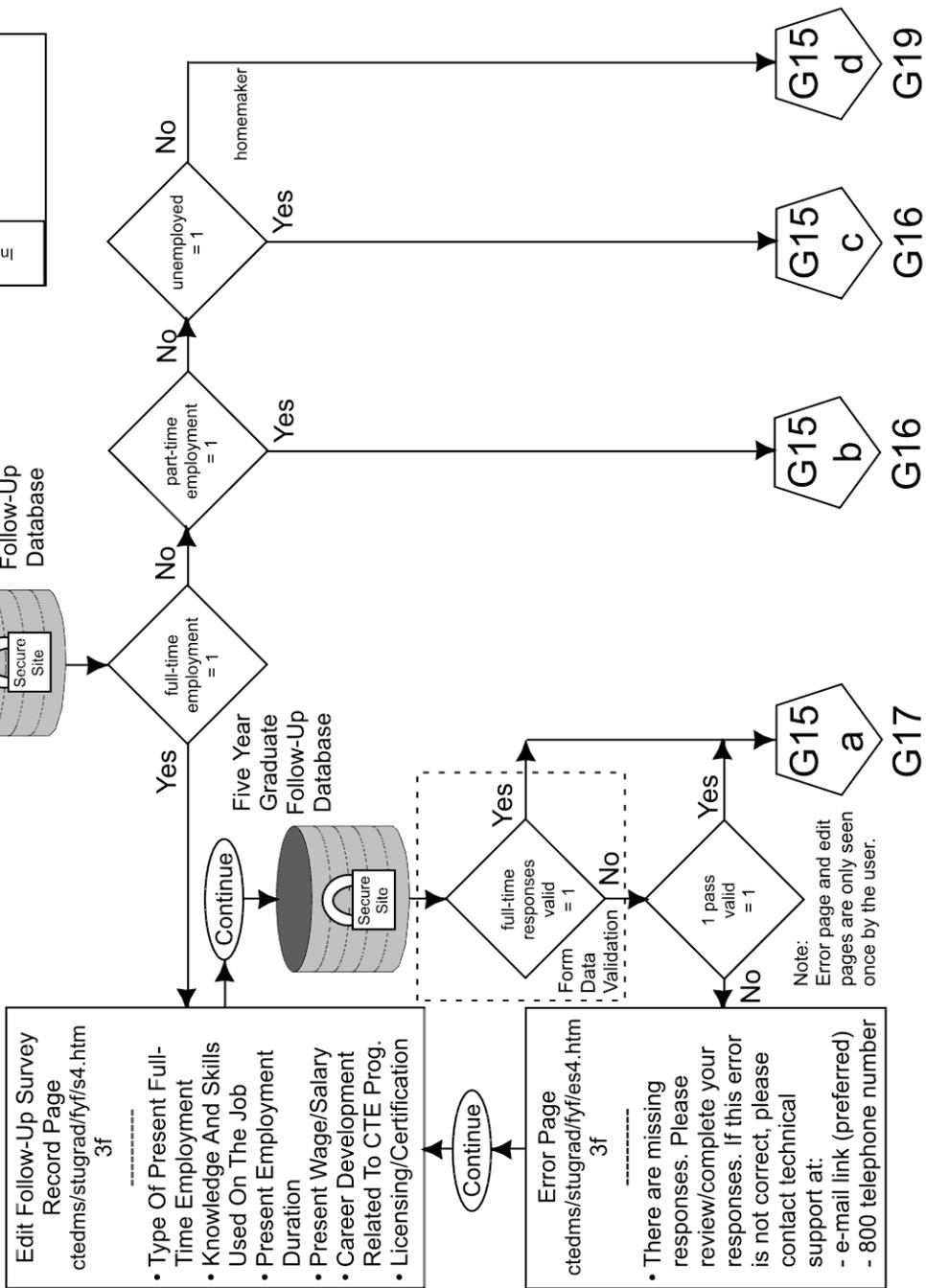
- THIS PAGE MUST BE COMPLETED TO CONTINUE WITH THE SURVEY
- Edit Page Is Identical To The New Follow-Up Survey Record Page
- Current Employment Status Selection
  - Full-time
  - Part-time
  - Unemployed
  - Educational Status Selection



**G15**

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Five Year Follow-Up  
 ctedms/stugrad/fy/fi/s2.htm  
 or  
 ctedms/stugrad/fy/fi/s3.htm



**Edit Follow-Up Survey Record Page**  
 ctedms/stugrad/fy/fi/s4.htm  
 3f

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- Type Of Present Full-Time Employment
- Knowledge And Skills Used On The Job
- Present Employment Duration
- Present Wage/Salary
- Career Development Related To CTE Prog.
- Licensing/Certification

**Error Page**  
 ctedms/stugrad/fy/fi/s4.htm  
 3f

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- There are missing responses. Please review/complete your responses. If this error is not correct, please contact technical support at:  
 - e-mail link (preferred)  
 - 800 telephone number

Note:  
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G14 a

G15 a

G15 b

G15 c

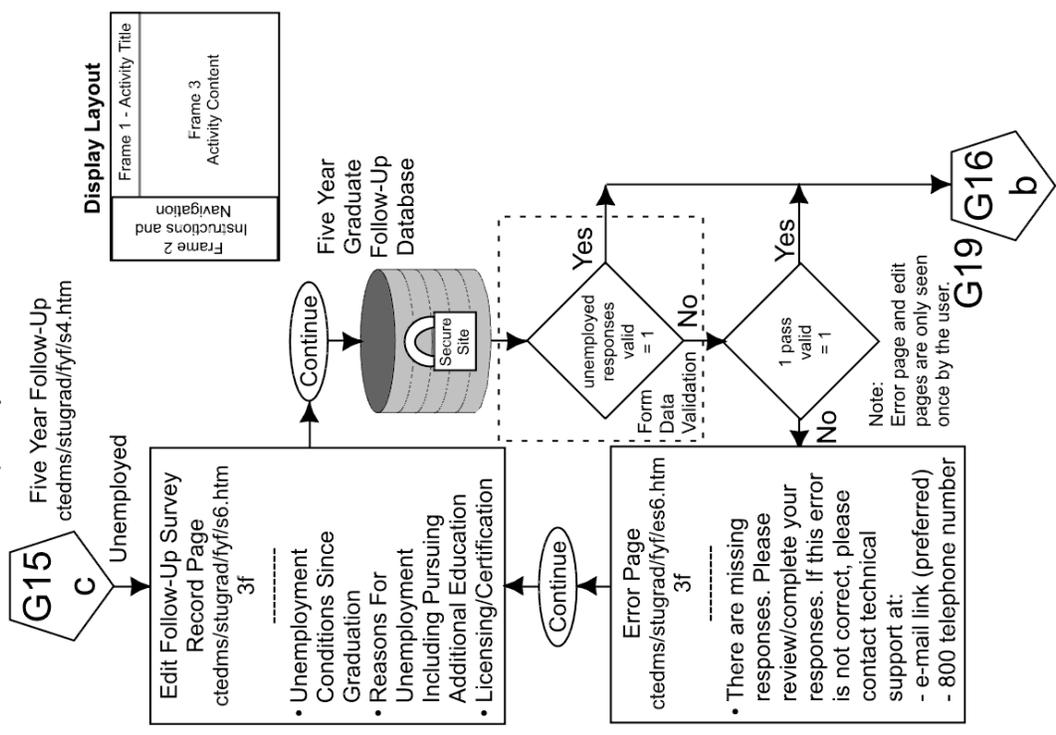
G15 d

G16

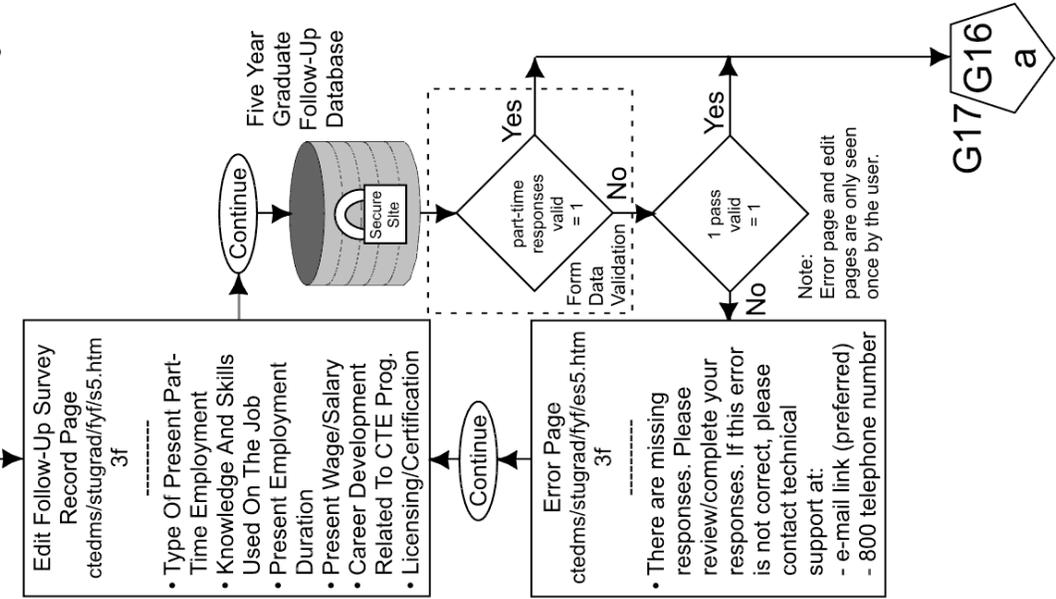
G17

**G16**

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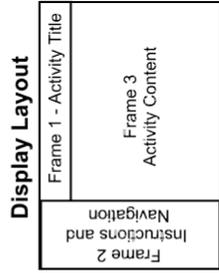


**G15 b** Five Year Follow-Up Record Page (Part-Time Employment)  
 ctedms/stugrad/fyfi/s4.htm  
 3f



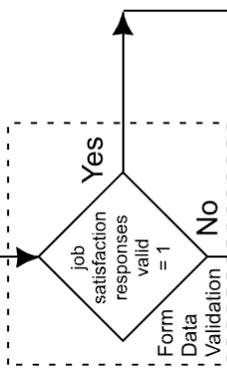
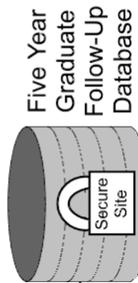
**G17**

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Full-time Employment  
**G15 a**

Part-time Employment  
**G16 a**



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**Edit Follow-Up Survey Record Page**  
 ctedms/stugrad/fyff/s7.htm  
 3f

- Job Satisfaction
  - Current job only
  - Most important job, if multiple jobs
- Inquiry items:
  - > salary/wage
  - > supervision
  - > co-workers
  - > advancement potential
  - > employer expectations
  - > work assignments
  - > responsibility
  - > job security
  - > benefits
  - > company policies and practices
  - > overall working conditions
  - > training and development

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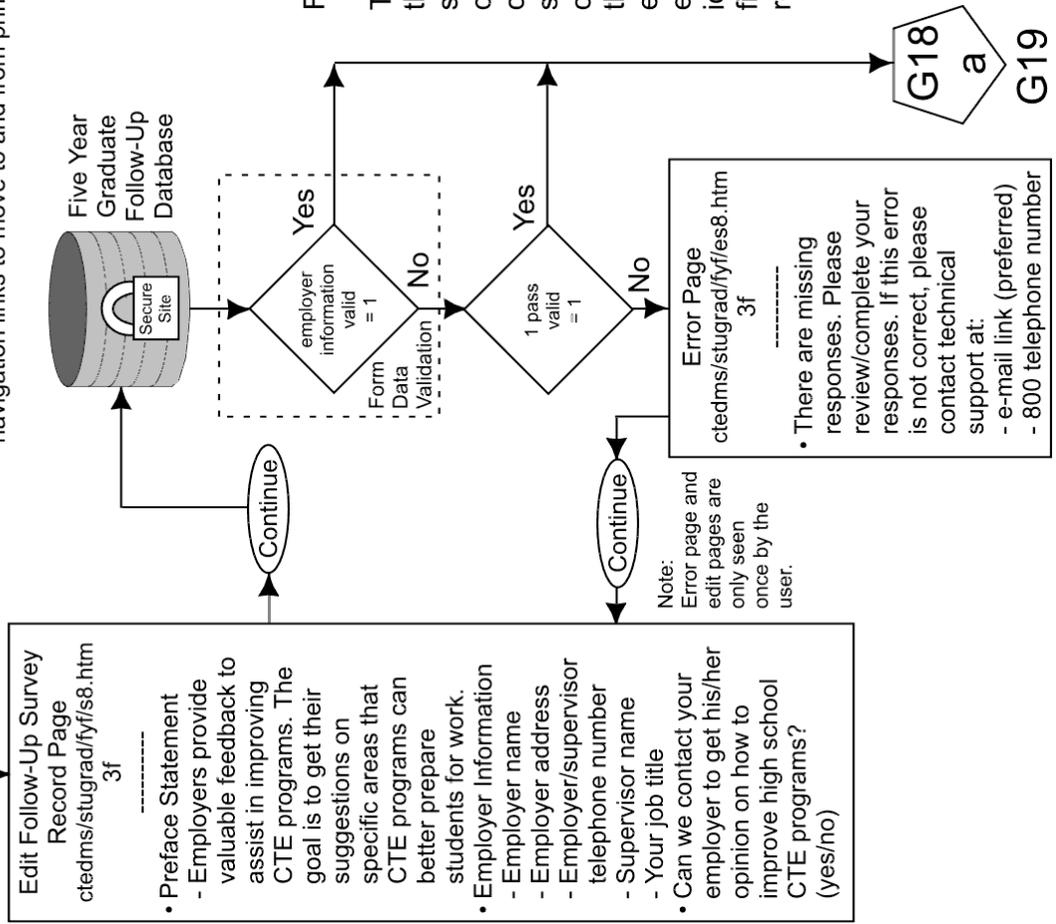
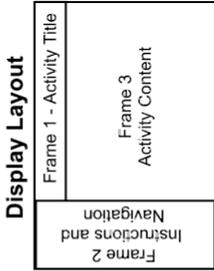
**Error Page**  
 ctedms/stugrad/fyff/es7.htm  
 3f

- There are missing responses. Please review/complete your responses. If this error is not correct, please contact technical support at:
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**G17 a**  
**G18**

**G18**

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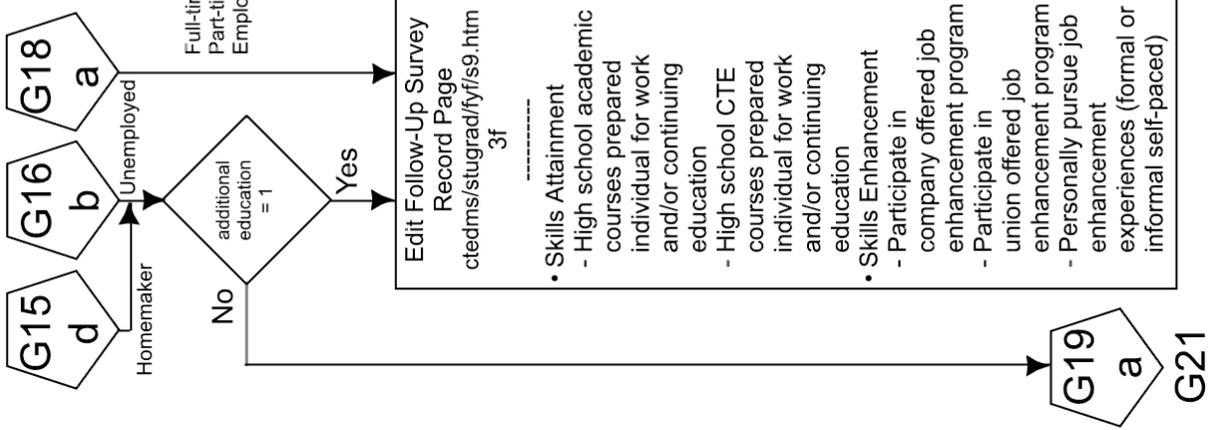
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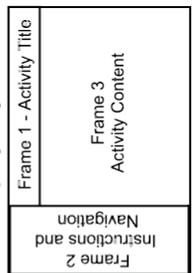
• There are missing responses. Please review/complete your responses. If this error is not correct, please contact technical support at:  
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**Display Layout**



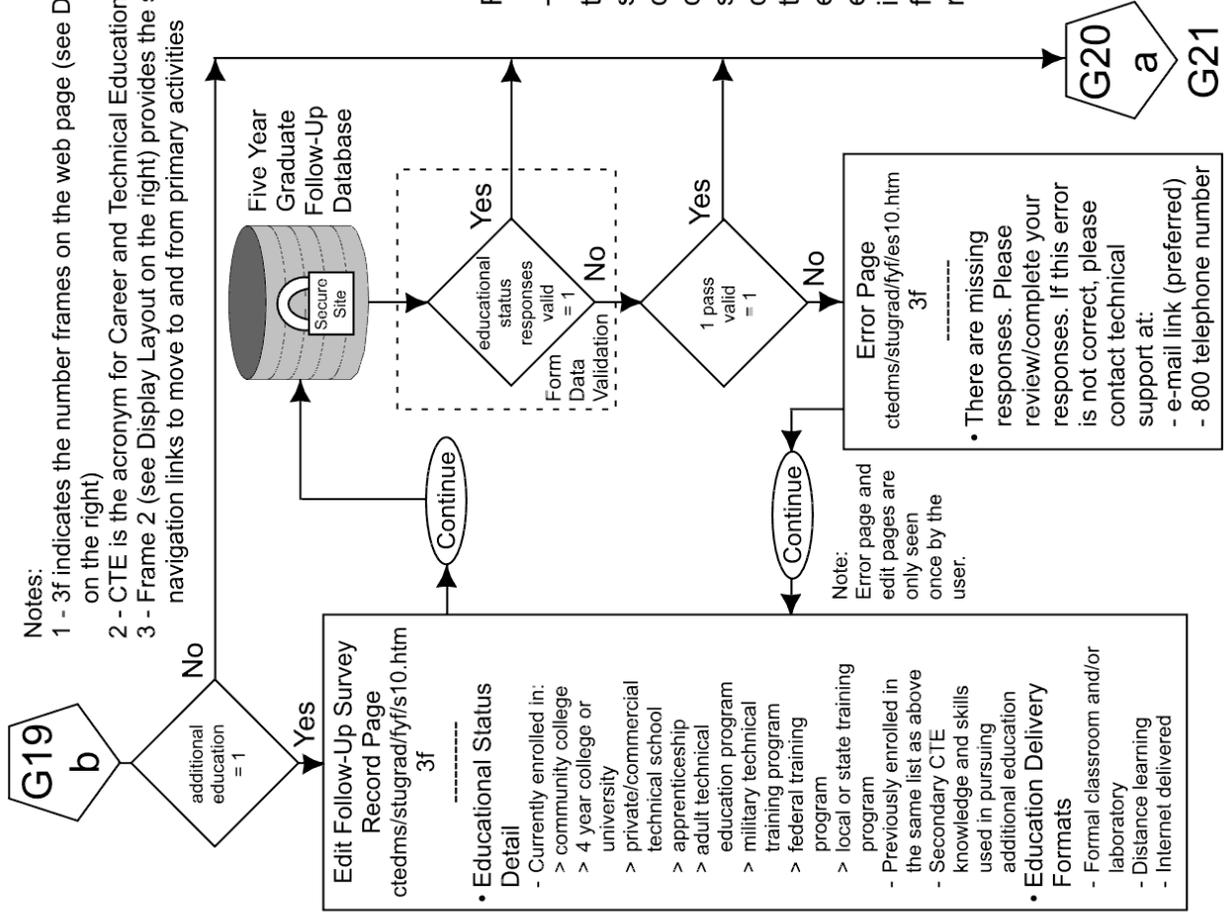
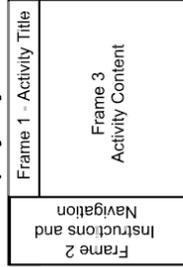
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**G20**

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**G20 a**  
**G21**

**Error Page**  
ctedms/stugrad/fy/yes10.htm  
3f

- There are missing responses. Please review/complete your responses. If this error is not correct, please contact technical support at:  
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- 800 telephone number

Note:  
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**Edit Follow-Up Survey Record Page**  
ctedms/stugrad/fy/fs10.htm  
3f

- **Educational Status Detail**
  - > Currently enrolled in:
    - > community college
    - > 4 year college or university
    - > private/commercial technical school
    - > apprenticeship
    - > adult technical education program
    - > military technical training program
    - > federal training program
    - > local or state training program
  - > Previously enrolled in the same list as above
  - Secondary CTE knowledge and skills used in pursuing additional education
- **Education Delivery Formats**
  - Formal classroom and/or laboratory
  - Distance learning
  - Internet delivered

**G21**

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**Display Layout**

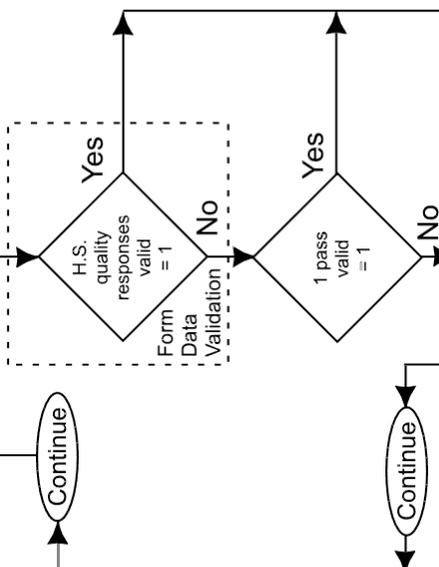
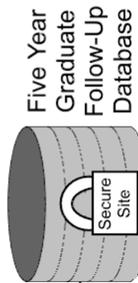


**G19 a**

**G20 a**

Edit Follow-Up Survey Record Page  
 ctedms/stugrad/fy/s11.htm  
 3f

- Quality Of High School Education
- Rate aspects of the high school education experience
  - > facilities
  - > equipment
  - > computer technology
  - > courses
  - > instruction
  - > organizations
  - > academic advisement
  - > encouragement
  - > academic standards
  - > career exploration and counseling
  - > alumni association
- Standardized H. S. Tests
  - Assisted me in determining the subjects needed to do well on the job and/or necessary to pursue additional education?

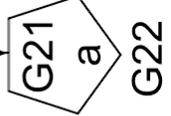


**Error Page**  
 ctedms/stugrad/fy/s11.htm  
 3f

- There are missing responses. Please review/complete your responses. If this error is not correct, please contact technical support at:  
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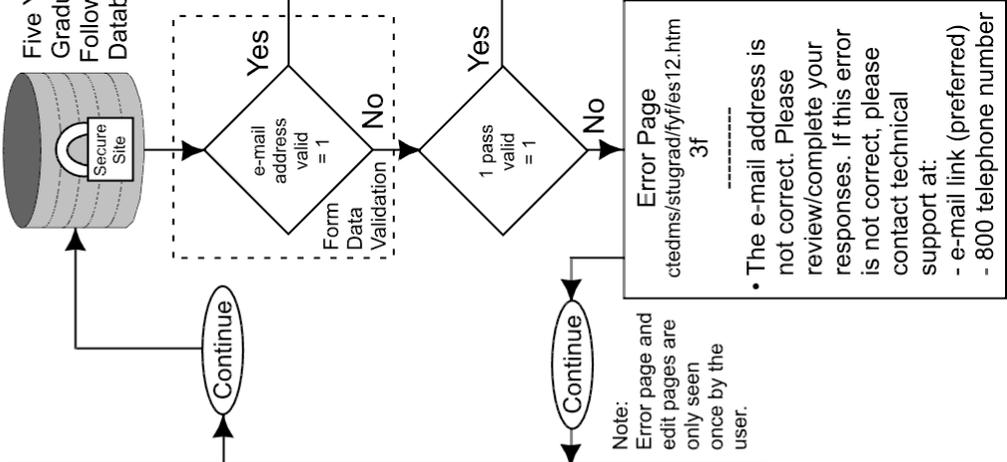


- Notes:
- 1 - 3f indicates the number frames on the web page (see Display Layout on the right)
  - 2 - CTE is the acronym for Career and Technical Education (secondary)
  - 3 - Frame 2 (see Display Layout on the right) provides the site navigation links to move to and from primary activities

**G21 a**

**Edit Follow-Up Survey Record Page**  
ctedms/stugrad/fy/fi/s12.htm  
3f

- Enter current and preferred e-mail address
- Thank the individual for participating in the follow-up process.
- This activity is critical to making the entire follow-up process work.
- Set "completed survey" to 1 this will not let the password to take the survey again
- Return the student to the Students and Graduates home page (ctedms/stugrad/



**Display Layout**



**Form Data Validation**

This is a data checking routine that will check the submitted student supplied data for completeness, not necessarily correctness. The routine is satisfied when all validation checks are equal to 1 (valid). If the routine is not satisfied, the edit form is displayed after an error page is displayed that identifies the erroneous data field entry. It is a sequential routine.

Note:  
Error page and edit pages are only seen once by the user.

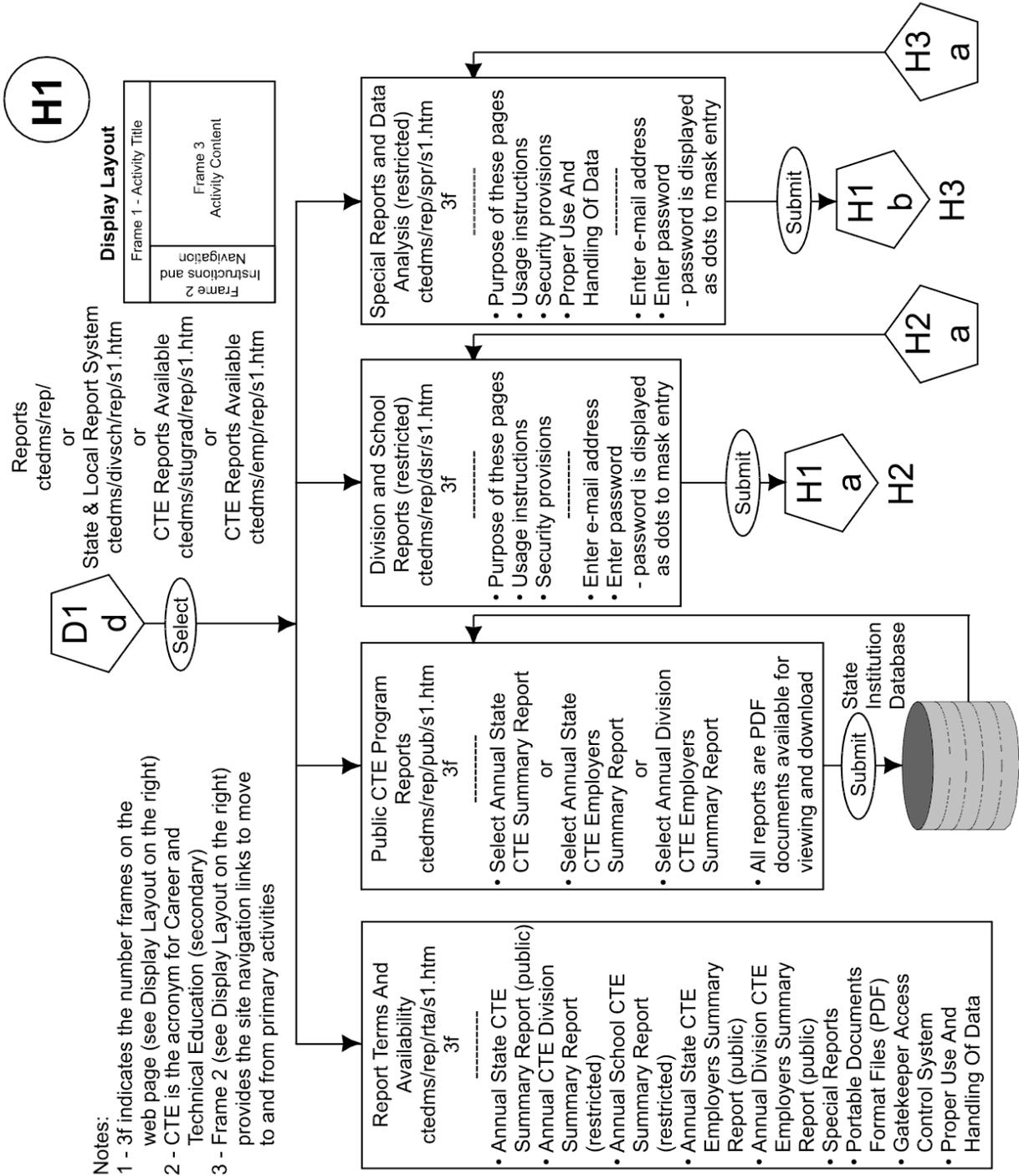
**Error Page**  
ctedms/stugrad/fy/es12.htm  
3f

- The e-mail address is not correct. Please review/complete your responses. If this error is not correct, please contact technical support at:  
- e-mail link (preferred)  
- 800 telephone number

## APPENDIX H

### CTEDMS Process Flowchart

Reports  
[ctedms/rep/](#)

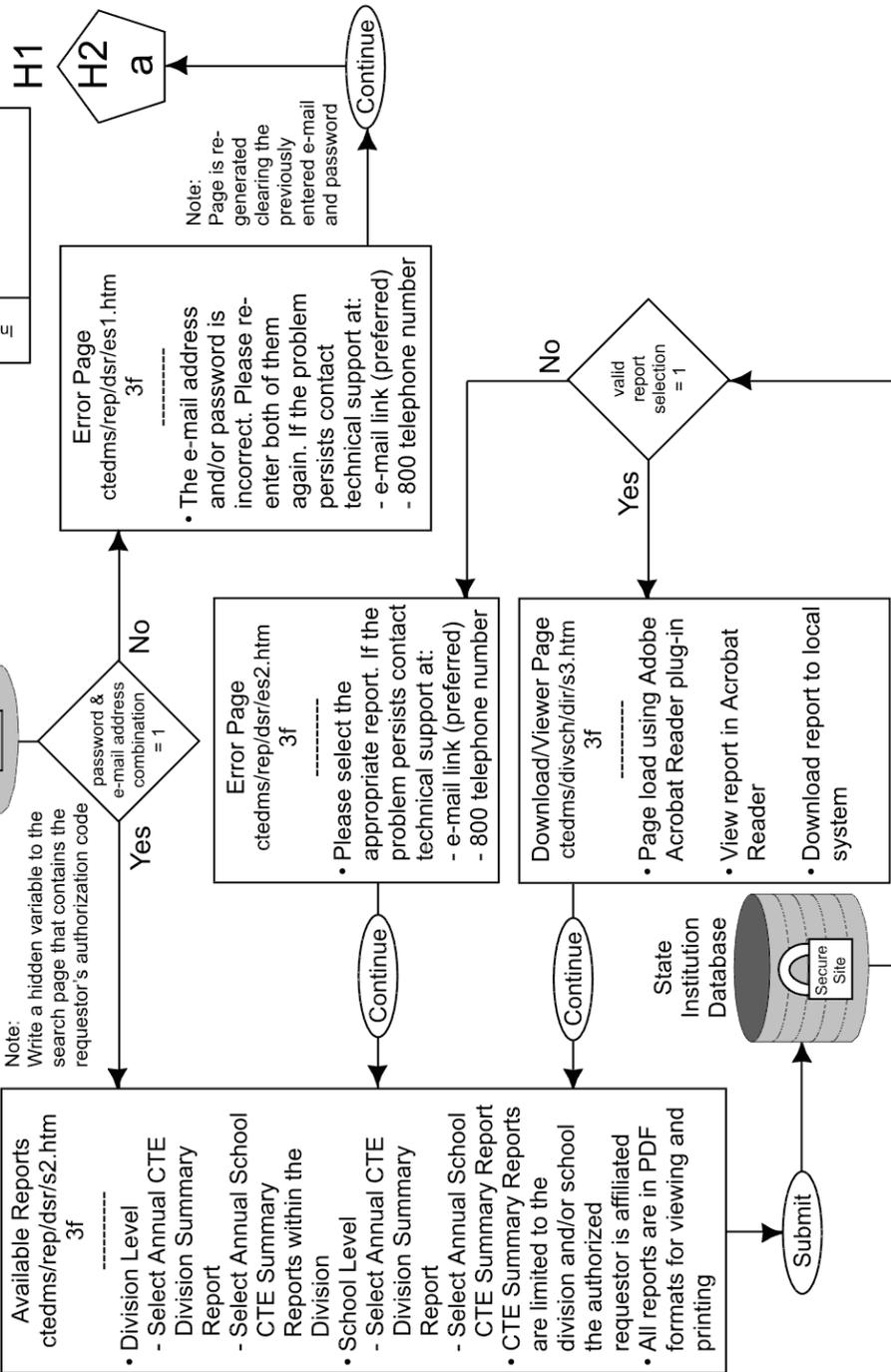
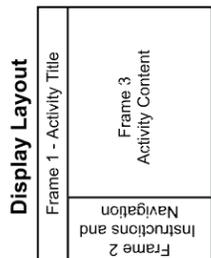


**H2**

Division and School Reports (restricted)  
ctedms/rep/dsr/s1.htm

**H1 a**

- Notes:
- 1 - 3f indicates the number frames on the web page (see Display Layout on the right)
  - 2 - CTE is the acronym for Career and Technical Education (secondary)
  - 3 - Frame 2 (see Display Layout on the right) provides the site navigation links to move to and from primary activities





## APPENDIX I

### CTEDMS Process Flowchart

Program Contacts and Assistance  
[ctedms/cont/](#)

I1

D1  
e

Notes:

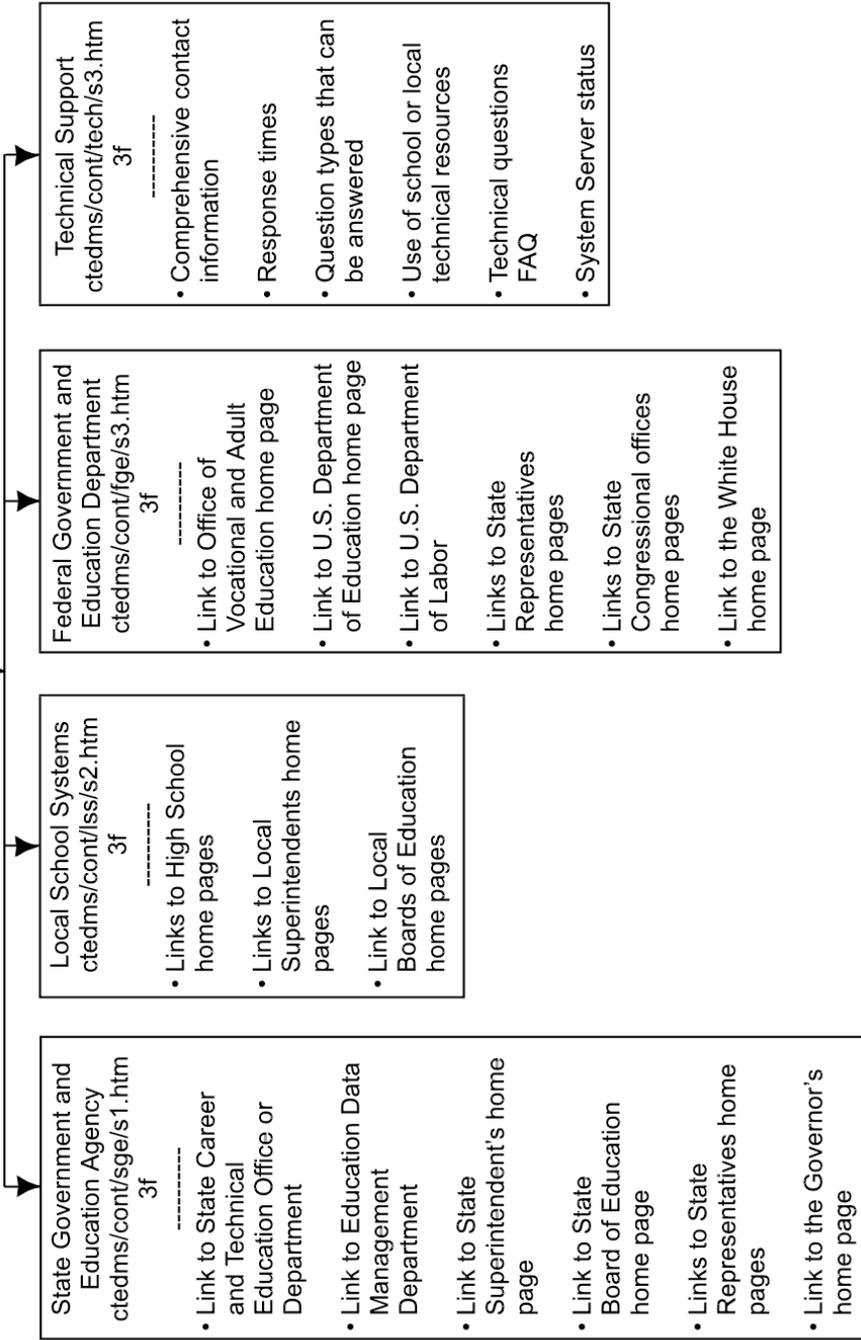
- 1 - 3f indicates the number frames on the web page (see Display Layout on the right)
- 2 - CTE is the acronym for Career and Technical Education (secondary)
- 3 - Frame 2 (see Display Layout on the right) provides the site navigation links to move to and from primary activities

Display Layout



Program Contacts & Assistance  
ctedms/cont/ - 3f

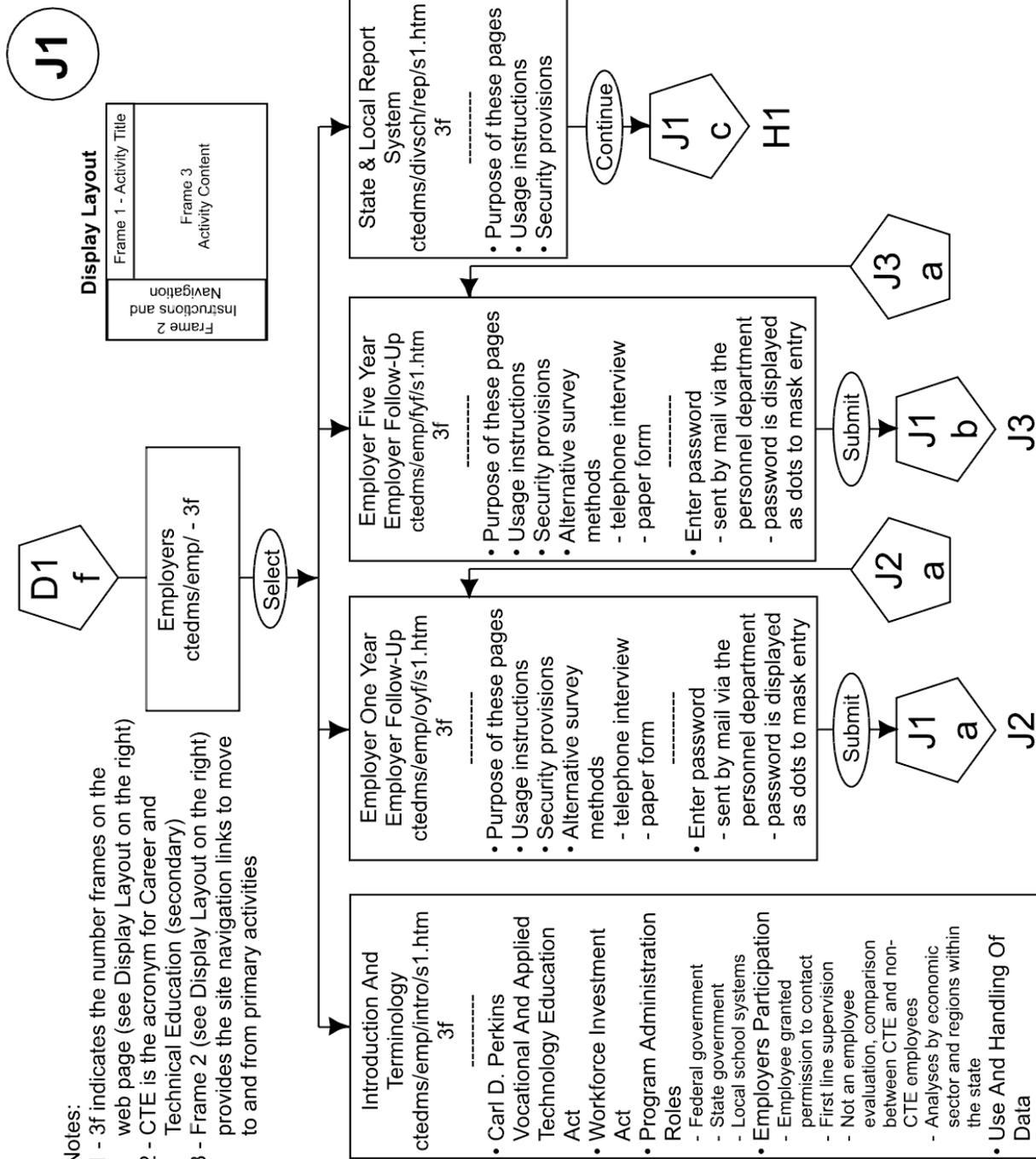
Select



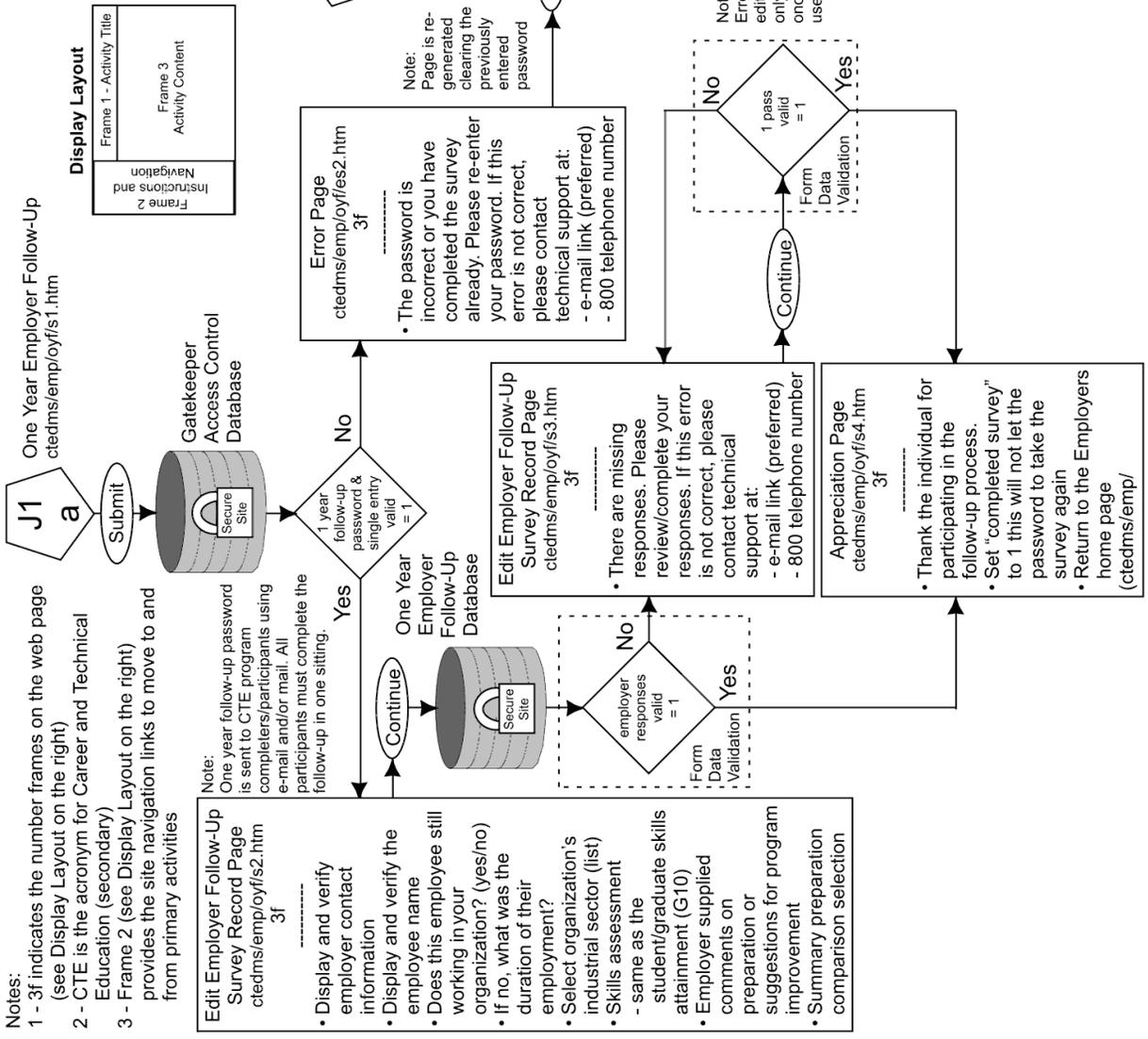
## APPENDIX J

### CTEDMS Process Flowchart

Employers  
[ctedms/emp/](#)



J2



Notes:

- 1 - 3f indicates the number frames on the web page (see Display Layout on the right)
- 2 - CTE is the acronym for Career and Technical Education (secondary)
- 3 - Frame 2 (see Display Layout on the right) provides the site navigation links to move to and from primary activities

**Edit Employer Follow-Up Survey Record Page**  
ctedms/emp/oyf/s2.htm  
3f

- Display and verify employer contact information
- Display and verify the employee name
- Does this employee still working in your organization? (yes/no)
- If no, what was the duration of their employment?
- Select organization's industrial sector (list)
- Skills assessment
- same as the student/graduate skills attainment (G10)
- Employer supplied comments on suggestions for program improvement
- Summary preparation comparison selection

**Note:**  
One year follow-up password is sent to CTE program completers/participants using e-mail and/or mail. All participants must complete the follow-up in one sitting.

**Edit Employer Follow-Up Survey Record Page**  
ctedms/emp/oyf/s3.htm  
3f

- There are missing responses. Please review/complete your responses. If this error is not correct, please contact technical support at:  
- e-mail link (preferred)  
- 800 telephone number

**Appreciation Page**  
ctedms/emp/oyf/s4.htm  
3f

- Thank the individual for participating in the follow-up process.
- Set "completed survey" to 1 this will not let the password to take the survey again
- Return to the Employers home page (ctedms/emp/oyf/es1.htm)

**Error Page**  
ctedms/emp/oyf/es2.htm  
3f

- The password is incorrect or you have completed the survey already. Please re-enter your password. If this error is not correct, please contact technical support at:  
- e-mail link (preferred)  
- 800 telephone number

**Note:**  
Page is re-generated clearing the previously entered password

**Note:**  
Error page and edit pages are only seen once by the user.





## APPENDIX K

U.S. Department of Education  
Program Memorandum OVAE/DVTE – 99-2  
Application of the Family Education Rights and  
Privacy Act  
May 27, 1999

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### Application of the Family Educational Rights and Privacy Act

#### Program Memorandum - OVAE/DVTE - 99-12

Date: May 27, 1999  
 To: State Directors of Vocational - Technical Education  
 State Directors of Community, Technical and Junior Colleges  
 State Tech-Prep Coordinators  
 From: Patricia W. McNeil  
 Subject: Application of the Family Educational Rights and Privacy Act to Performance Reporting under the Perkins Vocational and Technical Education Act of 1998

The purpose of this memorandum, which was developed in consultation with the Department's Family Policy Compliance Office, is to address concerns raised by some States that the Family Educational Rights and Privacy Act (FERPA) prohibits eligible agencies and eligible recipients under the Carl D. Perkins Vocational and Technical Education Act of 1998 (Public Law 105-332)(Perkins III) from complying with the performance accountability requirements of section 113 of Perkins III. Section 5 of Perkins III states that "[n]othing in this Act shall be construed to supersede the privacy protections afforded students and parents under" FERPA.

FERPA and the accountability requirements established by Perkins III are not in conflict. FERPA does not pose an obstacle to the ability of eligible agencies and eligible recipients to comply with the requirements of section 113 or other reporting requirements established under Perkins III.

#### Family Educational and Privacy Rights Act

As you know, FERPA is a Federal law that protects an eligible student's privacy interest in his or her "education records." In particular, FERPA affords eligible students the right to inspect and review their education records, the right to seek to have the records amended, and the right to have some control over the disclosure of information from the records. The term "education records" is broadly defined as:

"[T]hose records, files, documents, and other materials, which (i) contain information directly related to a student; and (ii) are maintained by an educational agency or institution or by a person acting for such agency or institution. [20 U.S.C. § 1232g(a)(4). See also 34 CFR § 99.3 "Education records."]

FERPA provides that education records, or personally identifiable information from such records, may be disclosed by educational agencies and institutions only after an eligible student provides prior written consent, except in statutorily specified

circumstances. [20 U.S.C. § 1232g(b)(1) and (d). See also 34 CFR § 99.30.] "Personally identifiable information" is defined by 34 CFR § 99.3 as information that "includes but is not limited to:

- a. the student's name;
- b. the name of the student's parent or other family member;
- c. the address of the student or the student's family;
- d. a personal identifier, such as the student's social security number or student number;
- e. a list of personal characteristics that would make the student's identity easily traceable; or
- f. other information that would make the student's identity easily traceable."

FERPA generally prohibits the nonconsensual disclosure of information derived from education records, except in certain circumstances [20 U.S.C. § 1232g(b); 34 CFR § 99.31]. If one or more of the exceptions are met, an educational agency or institution may disclose education records, or personally identifiable information from education records, without prior written consent.

One of these statutory exceptions permits the nonconsensual disclosure of information derived from education records to "authorized representatives of" the Comptroller General of the United States, the Secretary, or "State educational authorities" "in connection with the audit and evaluation of Federally-supported education programs, or in connection with the enforcement of the Federal legal requirements which relate to such programs." Any information collected by these officials "shall be protected in a manner which will not permit the personal identification of students and their parents by other than those officials, and such personally identifiable data shall be destroyed when no longer needed for such audit, evaluation, and enforcement of Federal legal requirements." [20 USC § 1232g(b)(1)(C), (b)(3). See also 34 CFR § 99.31].

### **Accountability Requirements of Perkins III**

To promote continuous program improvement, as well as to ensure optimal return on the Federal investment, Perkins III creates a State performance accountability system. Under this system, the Secretary and each eligible agency reach agreement on annual levels of performance for a number of "core indicators" specified in the law:

- Student attainment of challenging State established academic, and vocational and technical, skill proficiencies.
- Student attainment of a secondary school diploma or its recognized equivalent, a proficiency credential in conjunction with a secondary school diploma, or a postsecondary degree or credential.
- Placement in, retention, and completion of, postsecondary education or advanced training, placement in military service, or placement or retention in employment.
- Student participation in and completion of vocational and technical education programs that lead to nontraditional training and employment [section 113(a) and (b) of Perkins III].

Eligible agencies may also identify additional core indicators and set adjusted levels of performance for these indicators.

Section 113(c) of Perkins III requires each eligible agency receiving an allotment under section 111 of Perkins III to annually prepare and submit a report to the Secretary regarding:

- A. the progress of the State in achieving the State adjusted levels of performance on the core indicators of performance; and
- B. information on the levels of performance achieved by the State with respect to the additional indicators of performance, including the levels of performance for special populations." [section 113(c)(1)]

The report must also include a "quantifiable description of the progress special populations participating in vocational and technical education programs have made in meeting the State adjusted levels of performance established by the eligible agency" [section 113(c)(2)].

In addition, section 114(a)(1) of Perkins III requires the Secretary "to collect performance information about, and report on, the condition of vocational and technical education and on the effectiveness of State and local programs, services, and activities carried out under" title I of Perkins III. Section 114(c)(4) authorizes the Secretary to "collect and disseminate information from States regarding State efforts to meet State adjusted levels of performance described in section 113" of Perkins III. Section 206 of Perkins III requires eligible agencies to "prepare and submit to the Secretary a report on the effectiveness of the tech-prep programs" assisted under Title II.

Further, section 114(b)(2) of Perkins III requires all eligible agencies receiving assistance under Perkins III to "cooperate with the Secretary in implementing the information systems developed pursuant to" Perkins III.

Eligible agencies must use the State adjusted levels of performance to evaluate the activities of eligible recipients annually [section 123(b)]. Eligible agencies also have a responsibility to ensure the accuracy of performance information reported by eligible recipients. Section 122(c)(20) of Perkins III requires eligible agencies to describe in their State plans how they "will ensure that the data reported to the eligible agency from local educational agencies and eligible institutions under this title and the data that the eligible agency reports to the Secretary are complete, accurate, and reliable."

#### **Application of FERPA to Perkins III Reporting Requirements**

The Department will collect information from eligible agencies about State progress in meeting the State adjusted levels of performance through an OMB-approved annual performance report that we expect will be finalized later in 1999. Members of the public will have an opportunity to comment upon the annual performance report before it is finalized.

The Department does not intend to collect any personally identifiable information with respect to any student as part of this annual performance report. However, the aggregate information that will be collected may be derived from the education records of students. Since reporting of this performance information is required by section 113(c) of Perkins III, the nonconsensual disclosure of this information by eligible agencies to the Secretary is permitted by 20 USC § 1232g(b)(1)(C), 34 CFR § 99.31(a)(3) and 34 CFR § 99.35.

To fulfill their reporting responsibilities under Perkins III, eligible agencies may request such performance information as they deem appropriate from eligible recipients, to the extent consistent with State law. This information may or may not include personally identifiable information with respect to individual students, depending upon how the State chooses to carry out its accountability and performance reporting responsibilities. For example, if there was only one limited English proficient (LEP) student in a program, the reporting of performance information for the program disaggregated by LEP status

could entail the disclosure of personally identifiable information because this information could "make the student's identity easily traceable" [34 CFR §99.3]. Whether or not it includes personally identifiable information, the performance data collected from eligible recipients may be derived from the education records of students.

Since the reporting of this information is required by section 113(c) of Perkins III, the nonconsensual disclosure of this information, including personally identifiable information, by eligible recipients to eligible agencies is permitted by 20 USC § 1232g(b)(1)(C), 34 CFR § 99.31(a)(3) and 34 CFR § 99.35.

If the eligible recipient discloses personally identifiable information, both the eligible recipient and the eligible agency must comply with the requirements of 34 CFR § 99.35(b). The information must "be protected in a manner that does not permit personal identification of individuals by anyone except" Federal or State educational officials and "be destroyed when no longer needed for the purposes" of fulfilling Federal legal requirements. Pursuant to 34 CFR §99.32, if the eligible recipient discloses personally identifiable information with respect to any student to the eligible agency, it must maintain a record of this disclosure with the education records of the student.

I hope this memorandum addresses your concerns about the application of FERPA to the Perkins III reporting requirements. Please direct any further questions you may have about FERPA to:

Family Policy Compliance Office  
U.S. Department of Education  
400 Maryland Avenue, SW  
Washington, DC 20202-4605  
(202) 260-3887 (Telephone)  
(202) 260-9001 (Fax)

This page last modified—July 24, 2002 (cd)

Technical questions about the Web site: [webmaster@inet.ed.gov](mailto:webmaster@inet.ed.gov)  
Other inquiries/comments: [ovae@ed.gov](mailto:ovae@ed.gov)

## APPENDIX L

U.S. Department of Education  
Program Memorandum OVAE/DVTE –  
2001-2  
Family Education Rights and Privacy Act  
January 18, 2001

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**Family Educational Rights and Privacy Act****Program Memorandum - OVAE/DVTE - 2001-2**

Date: January 18, 2001

To: Chief State School Officers  
 State Directors of Vocational-Technical Education  
 State Directors of Adult Education  
 State Directors of Community, Technical and Junior Colleges

From: Patricia W. McNeil

Subject: The Family Educational Rights and Privacy Act and the Use of State Unemployment Insurance Wage Records to Report on Performance under the Carl D. Perkins Vocational and Technical Education Act and the Adult Education and Family Literacy Act

The Carl D. Perkins Vocational and Technical Education Act (P.L.105-332) (20 U.S.C. § 2301 *et seq.*) (Perkins III) and the Adult Education and Family Literacy Act (Title II of the Workforce Investment Act of 1998, P.L. 105-220) (20 U.S.C. § 2901 *et seq.*) (AEFLA) hold States accountable for reporting on, and achieving, annual performance goals for the placement and retention of students in employment, as well as a number of other student outcomes. In addition, some States have established comparable accountability requirements for State community college systems. There is growing interest among States in using State unemployment insurance (UI) wage records to determine the employment status of former students in order to fulfill these requirements. Generally, State UI wage records can provide more accurate information than mail or telephone surveys of former students. Moreover, using State UI records is less expensive than mail or telephone surveys.

The Department supports your efforts to improve the accuracy of the information that your State collects concerning student outcomes and to reduce the burden of obtaining this information. However, preserving student privacy is also required by law. As you investigate using State UI wage records to determine the employment status of students, please note that this approach requires the use of personally identifiable information from student education records. Such personally identifiable information is protected by the Family Educational Rights and Privacy Act (FERPA) (20 U.S.C. § 1232g). The purpose of this memorandum is to assist you in understanding FERPA's privacy protections and how to use State UI wage records to determine the employment status of former students in accordance with FERPA. This guidance applies solely to Perkins III and AEFLA. It was developed in consultation with the Undersecretary and the Family Policy Compliance Office, which administers FERPA.

**Accountability Requirements Established by Perkins III and AEFLA**

Perkins III creates a State performance accountability system for vocational and technical education through which the Secretary and each eligible agency reach agreement on annual levels of performance for a number of "core indicators" specified in the law. Student "placement in, retention, and completion of, postsecondary education or advanced training, placement in military service, or placement or retention in employment" is one of these core indicators (section 113(b)(2)(iii)). Each eligible agency must use the State adjusted levels of performance to evaluate annually the activities of eligible recipients (section 123(b)). Section 113(c) of Perkins III also requires each eligible agency to submit annually a report to the Secretary regarding "the progress of the State in achieving the State adjusted levels of performance on the core indicators of performance."

AEFLA establishes a similar performance accountability system for adult education and literacy activities. The Secretary and each eligible agency reach agreement on annual levels of performance for a number of "core indicators" specified in the law, including "placement in, retention in, or completion of postsecondary education, training, unsubsidized employment or career advancement" (section 212(b)(2)(ii) of WIA). Each eligible agency must evaluate annually the effectiveness of local adult education and literacy activities using the core indicators of performance (section 224(b)(3)). States must report annually to the Secretary on "the progress of the eligible agency in achieving eligible agency performance measures, including information on the levels of performance achieved by the eligible agency with respect to the core indicators of performance" (section 212(c)).

To fulfill these evaluation and reporting requirements, a number of States have expressed interest in using State UI wage records to determine the employment status of former students. Maintained by State labor or employment security agencies, these records consist of quarterly reports of employee earnings that are submitted by employers who are required to comply with the State's unemployment compensation law. In most cases, a wage record includes at least three data elements: (1) an employee's social security number (SSN); (2) the total amount of reportable earnings paid to the employee during the quarter; and (3) the employer's unique identifier. Although Federal and State law protects the confidentiality of this information, most States have established procedures to enable other public agencies to access the information for evaluation purposes.

The employment status of a former student can only be determined from UI wage records by using the student's SSN. A student's SSN, however, is personally identifiable information that is protected by FERPA.

#### **Family Educational and Privacy Rights Act**

As you know, FERPA is a Federal law that protects an eligible student's privacy interest in his or her "education records." In particular, FERPA affords eligible students the right to inspect and review their education records, the right to seek to have the records amended, and the right to have some control over the disclosure of information from the records. The term "education records" is broadly defined as:

"[T]hose records, files, documents, and other materials, which (i) contain information directly related to a student; and (ii) are maintained by an educational agency or institution or by a person acting for such agency or institution." (20 U.S.C. § 1232g(a)(4). See also 34 CFR § 99.3 "Education records.")

FERPA provides that education records, or personally identifiable information from

such records, may be disclosed by educational agencies and institutions only after an eligible student provides prior written consent, except in statutorily specified circumstances. [(20 U.S.C. § 1232g(b)(1) and (d). See also 34 CFR § 99.30.)] "Personally identifiable information" is defined by 34 CFR § 99.3 as information that "includes but is not limited to:

- (a) the student's name;
- (b) the name of the student's parent or other family member;
- (c) the address of the student or the student's family;
- (d) a personal identifier, such as the student's social security number or student number;
- (e) a list of personal characteristics that would make the student's identity easily traceable; or
- (f) other information that would make the student's identity easily traceable."

Because the vocational and adult education laws include identical provisions stipulating that "[n]othing in this Act shall be construed to supersede the privacy protections afforded students and parents under" FERPA (section 5 of Perkins III, section 504(a) of WIA), States must comply with FERPA in using State UI wage records.

Generally, there are three options available to State educational authorities for using State UI wage records consistent with the requirements of FERPA:

- "Importing" State UI wage records and using them internally to determine the employment status of former students;
- Obtaining the prior consent of eligible students to disclose their SSNs to the State UI agency (or other agency that has access to State UI wage records) in order to determine whether they secured or retained employment after they exited the program; and
- Authorizing the State UI agency (or other State agency that has access to UI records) to obtain student SSNs directly from local education agencies and educational institutions, determine the employment status of these students, and report the aggregate results, after which students' personally-identifiable information would be destroyed by the agency authorized to match the UI data.

#### **"Importing" State UI Wage Records to Determine Employment Outcomes**

A State educational authority may obtain State UI wage record data from the State UI agency and then use this information internally to determine the employment status of students. This approach meets the requirements of FERPA because the State educational authority has not disclosed personally identifiable information from an education record to others. State law, however, may restrict the extent to which you may share personally identifiable information derived from wage records with local education agencies and educational institutions. Providing local education agencies and educational institutions with information about the earnings of individual students, for example, may be prohibited by Federal or State law.

#### **Obtaining Student Consent for Disclosures to the State UI Agency**

FERPA permits the disclosure of protected student information if a student has consented in advance to this disclosure in writing. Thus, a State educational authority

may disclose student SSNs to the State UI agency (or other agency that has access to State UI wage records) for the purpose of determining their employment status if it has secured the consent of these students for the disclosure. Requesting student consent for this disclosure, for example, may be made a regular part of the intake or admission process for vocational and adult education programs.

This written consent must be signed and dated by the eligible student and:

1. Specify the records that may disclosed;
2. State the purpose of the disclosure; and
3. Identify the party or class of parties to whom the disclosure may be made."  
(34 CFR § 99.30(b))

In addition, the State educational authority or local educational agency or institution must provide the student, upon his or her request, a copy of the records that are disclosed. (34 CFR § 99.30(c)(1)). A sample consent form that you may adapt is included in Appendix A.

#### **Authorizing a State UI Agency to Evaluate Employment Outcomes under Perkins III and AEFLA**

FERPA permits the disclosure of protected student information without the prior consent of students in certain, limited circumstances. (20 U.S.C. § 1232g(b); 34 CFR § 99.31). One exception permits the disclosure of information derived from education records without prior consent to "authorized representatives of" the Comptroller General of the United States, the Secretary, the Attorney General or "State or local educational authorities." The disclosure must be "in connection with the audit and evaluation of Federally-supported education programs, or in connection with the enforcement of the Federal legal requirements which relate to such programs."

Thus, a State educational authority may authorize the State UI agency (or other agency that has access to State UI wage records) to be its representative for the purpose of evaluating whether local vocational and adult education programs have achieved the student employment goals established by the State under Perkins III or AEFLA. Typically, this authorization will be executed by a Memorandum of Agreement (MOA) between the two agencies. The MOA must contain, at a minimum, the following provisions required by FERPA:

1. Information disclosed by a school to an authorized representative must not be redisclosed to a third party in personally identifiable form. The information only may be redisclosed in aggregate, non-personally identifiable form.
2. The information should be destroyed when no longer needed for the purpose of the disclosure.
3. The authorized representative may have access to the records in connection only with --
  - an audit or evaluation of a Federally supported education program; or
  - for the enforcement of or compliance with Federal legal requirements that relate to those programs.

See 20 U.S.C. § 1232g(b)(3); 34 CFR § 99.35. Sample Memoranda of Agreement are included as Appendix B.

Pursuant to the MOA, the State UI or other agency may then obtain student SSNs

directly from local educational agencies or educational institutions and determine the employment status of these students. It may also report the aggregate results of its evaluation to the State educational authority, but no personally identifiable information may be redisclosed in this report. We would expect that the State UI or other agency would destroy student SSNs and any other personally identifiable information at the time it makes its evaluation report to the State educational authority. In addition, FERPA also requires that each eligible recipient that discloses a student's SSN or other personally identifiable information must maintain a record of this disclosure with the education records of the student. (34 CFR § 99.32)

FERPA also allows a State UI agency to obtain a student's SSN directly from the State educational authority in order to determine the student's employment status. For the purposes of complying with the reporting requirements of Perkins III and AEFLA, a State educational authority may disclose a student SSN to the State UI agency if the UI agency has been made an "agent" of the State educational authority through a written MOA. This MOA should contain the same provisions discussed above.

We hope this memorandum is helpful to you in identifying how State UI wage records may be used to determine the employment status of students in a way manner that complies with FERPA. State laws concerning the privacy of student records and UI wage information also should be reviewed carefully as you consider the options available to you. If you have further questions regarding the requirements of Perkins III and AEFLA, you may contact Mr. Braden Goetz at (202) 205-3373 or Mr. Jon Weintraub at (202) 205-5602. Please direct any further questions you may have concerning FERPA to:

Family Policy Compliance Office  
U.S. Department of Education  
400 Maryland Avenue, SW  
Washington, DC 20202-4605  
(202) 260-3887 (Telephone)  
(202) 260-9001 (Fax)

#### Appendix A: Sample FERPA Consent Form

The following consent forms are examples that you should adapt to reflect the specific circumstances in your State.

##### *Carl D. Perkins Vocational and Technical Education Act*

I, a student at a postsecondary educational institution or a student age 18 years or older, \_\_\_\_\_, consent to the release of personally identifiable information from my education records or I, parent or guardian of a student at a secondary educational institution under the age of 18, \_\_\_\_\_ consent to the release of personally identifiable information from the education records of my son/daughter.

I understand that the records to be disclosed include my social security number and other personally identifiable information from my education records. I acknowledge that the purpose of the disclosure is to assist the \_\_\_\_\_ State Department of Education in obtaining and reporting information concerning the placement and retention of students in employment as required by section 113 of Carl D. Perkins Vocational and Technical Education Act. I understand that the personally identifiable information will be disclosed by the educational institution only to \_\_\_\_\_.

Department of Labor / \_\_\_\_\_ Unemployment Insurance Agency. This information may not be redisclosed to others and will be destroyed as soon as all statistical analysis has been performed, or when the information is no longer needed, whichever date comes first.

\_\_\_\_\_  
Signature of Parent or Student      Date

*Adult Education and Family Literacy Act*

I, a student at a postsecondary educational institution or a student age 18 years or older, \_\_\_\_\_, consent to the release of personally identifiable information from my education records or I, parent or guardian of a student at a secondary educational institution under the age of 18, \_\_\_\_\_ consent to the release of personally identifiable information from the education records of my son/daughter.

I understand that the records to be disclosed include my social security number and other personally identifiable information from my education records. I acknowledge that the purpose of the disclosure is to assist the \_\_\_\_\_ State Department of Education in obtaining and reporting information concerning the placement and retention of students in employment as required by section 212 of the Adult Education and Family Literacy Act. I understand that the personally identifiable information will be disclosed by the educational institution only to \_\_\_\_\_ Department of Labor / \_\_\_\_\_ Unemployment Insurance Agency. This information may not be redisclosed to others and will be destroyed as soon as all statistical analysis has been performed, or when the information is no longer needed, whichever date comes first.

\_\_\_\_\_  
Signature of Parent or Student      Date

**Appendix B: Draft Memoranda of Agreement**

The following memoranda of agreement are examples that you should adapt to reflect the specific circumstances in your State.

*Carl D. Perkins Vocational and Technical Education Act*

MEMORANDUM OF AGREEMENT BETWEEN  
\_\_\_\_\_  
STATE DEPARTMENT OF EDUCATION AND  
THE \_\_\_\_\_ DEPARTMENT OF LABOR/ THE \_\_\_\_\_ STATE  
UNEMPLOYMENT INSURANCE AGENCY

This agreement, made the \_\_\_\_\_ day of \_\_\_\_\_ 2001, between the \_\_\_\_\_ State Department of Education and the \_\_\_\_\_ Department of Labor (Labor Department)/ State Unemployment Agency (UI Agency). The purpose of this agreement is to designate the Labor Department/UI Agency as an "authorized representative" of the \_\_\_\_\_ Department of Education (Education Department) for purposes of obtaining and reporting information concerning the placement and retention of students in employment as required by section 113 of Carl D. Perkins Vocational and Technical Education Act (Perkins III).

*RECITALS:*

1. Local secondary and postsecondary educational institutions maintain education records on enrollees that include information on student demographics, programs of study, achievement, attainment and social security numbers. Such records also include information on students participating in vocational education programs. The \_\_\_\_\_ Labor Department/ UI Agency maintains unemployment insurance wage records on all qualified employees in \_\_\_\_\_ state.
2. Perkins III (P. L. 105-332) creates a State performance accountability system for vocational education programs. States must report annually to the U.S. Department of Education (ED) on the progress of the state in reaching agreed upon levels of performance on core indicators specified in the law. These core indicators include placement and retention in employment.
3. In order to determine employment outcomes for those vocational education students included \_\_\_\_\_'s Perkins III accountability system, local education agencies and educational institutions will supply the \_\_\_\_\_ Labor Department/UI Agency with a list of the social security numbers of these students. The \_\_\_\_\_ Labor Department/UI Agency will access unemployment insurance wage records using these social security numbers and determine employment outcomes for these students. The \_\_\_\_\_ Labor Department/UI Agency will report the results of this analysis to the \_\_\_\_\_ Education Department in aggregate form only, without personally identifiable information. Local education agencies and education institutions will not release personally identifiable information from the education records of students to state agencies or departments other than those listed in this agreement.
4. The Family Educational Rights and Privacy Act (FERPA) generally prohibits the disclosure of education records without the consent of the parent for children under the age of 18 or from students attending postsecondary educational institutions. Under FERPA, education records are defined as records directly related to a student and maintained by an educational agency or institution. The records accessed by \_\_\_\_\_ Department of Education to meet Perkins III performance reporting requirements are education records, and subject to FERPA.
5. FERPA contains several exceptions to the general rule that education records may not be disclosed without prior, written parental consent. One exception allows for disclosures to authorized representatives of the Secretary of Education, the Comptroller General, the Attorney General, and state and local educational authorities. Such a disclosure must be made in connection with an audit or evaluation of a Federal or State supported education program. The



*Adult Education and Family Literacy Act*

## MEMORANDUM OF AGREEMENT BETWEEN

\_\_\_\_\_ STATE DEPARTMENT OF EDUCATION AND  
 THE \_\_\_\_\_ DEPARTMENT OF LABOR/ THE \_\_\_\_\_ STATE  
 UNEMPLOYMENT INSURANCE AGENCY

This agreement, made the \_\_\_\_\_ day of \_\_\_\_\_ 2001, between the \_\_\_\_\_ State Department of Education and the \_\_\_\_\_ Department of Labor (Labor Department)/ State Unemployment Agency (UI Agency). The purpose of this agreement is to designate the Labor Department/UI Agency as an "authorized representative" of the \_\_\_\_\_ Department of Education (Education Department) for purposes of obtaining and reporting information concerning the placement and retention of students in employment as required by section 212 of the Adult Education and Family Literacy Act (AEFLA).

*RECITALS:*

1. Eligible providers maintain education records on participants enrolled in adult education and literacy programs that include information on student demographics, programs of study, achievement, attainment and social security numbers. The \_\_\_\_\_ Labor Department/ UI Agency maintains unemployment insurance wage records on all qualified employees in \_\_\_\_\_ state.
2. AEFLA (P. L. 105-220) creates a performance accountability system for adult education and literacy programs. States must report annually to the U.S. Department of Education (ED) on the progress of the state in reaching agreed upon levels of performance on core indicators specified in the law. These core indicators include placement and retention in employment.
3. In order to determine employment outcomes for students enrolled in adult education and literacy programs, eligible providers will supply the \_\_\_\_\_ Labor Department/UI Agency with a list of the social security numbers of these students. The \_\_\_\_\_ Labor Department/UI Agency will access unemployment insurance wage records using these social security numbers and determine employment outcomes for these students. The \_\_\_\_\_ Labor Department/UI Agency will report the results of this analysis to the \_\_\_\_\_ Education Department in aggregate form only, without personally identifiable information. Eligible providers will not release personally identifiable information from the education records of students to state agencies or departments other than those listed in this agreement.
4. The Family Educational Rights and Privacy Act (FERPA) generally prohibits the disclosure of education records without the consent of the parent for children under the age of 18 or from students attending postsecondary educational institutions. Under FERPA, education records are defined as records directly related to a student and maintained by an educational agency or institution. The records accessed by \_\_\_\_\_ Department of Education to meet AEFLA

performance reporting requirements are education records, and subject to FERPA.

5. FERPA contains several exceptions to the general rule that education records may not be disclosed without prior, written parental consent. One exception allows for disclosures to authorized representatives of the Secretary of Education, the Comptroller General, the Attorney General, and state and local educational authorities. Such a disclosure must be made in connection with an audit or evaluation of a Federal or State supported education program. The disclosure may also be made for the enforcement of or compliance with Federal legal requirements related to the Federal or State education program.

6. The disclosure from the \_\_\_\_\_ Education Department to the \_\_\_\_\_ Labor Department/UI Agency is for the purpose of complying with the performance reporting requirements of AEFLA, and is permissible under FERPA. ED has concluded that the \_\_\_\_\_ Labor Department/UI Agency can be designated an authorized representative for purposes of compiling and reporting information as required by AEFLA.

7. Without access to these records, the state of \_\_\_\_\_ will be unable to provide accurate performance information required by AEFLA in a timely and cost-effective manner.

**AGREEMENT:**

1. The \_\_\_\_\_ Education Department designates the \_\_\_\_\_ Labor Department/UI Agency as its "authorized representative" under FERPA for the limited purpose of collecting information directly from eligible providers in order to comply with the performance reporting requirements of AEFLA. This authorization is limited to the collection of information and data from the education records (as defined by FERPA) of students enrolled in adult education and literacy programs in \_\_\_\_\_. It is understood and acknowledged by the parties that the \_\_\_\_\_ Labor Department/UI Agency will not redisclose any personally identifiable information from the education records.

2. The \_\_\_\_\_ Labor Department/UI Agency agrees to destroy all personally identifiable information such as social security numbers obtained from the above-referenced education records as soon as all statistical analysis has been performed, or when the information is no longer needed, whichever date comes first. All versions of such information and data, electronic, paper, or otherwise, must be destroyed.

3. The \_\_\_\_\_ Education Department agrees to work with ED, and in particular, the Family Policy Compliance Office (FPCO) to ensure that every eligible provider which discloses education records to the \_\_\_\_\_ Labor Department/UI Agency will update its annual notification to include the \_\_\_\_\_ Labor Department/UI agency as a recipient of education records for the purposes of complying with the performance reporting requirements of AEFLA.

This agreement shall be in effect for \_\_\_\_\_ years from the date of the last signature.

\_\_\_\_\_

Family Educational Rights and Privacy Act

<http://www.ed.gov/offices/OVAE/CTE/ufirpa.html>

\_\_\_\_\_  
Superintendent Department of Education Date

\_\_\_\_\_  
Secretary Labor Department/UI Agency Date

This page last modified--July 18, 2002 (csd)

Technical questions about the Web site: [webmaster@inet.ed.gov](mailto:webmaster@inet.ed.gov)  
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# VITA

## VITA

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May 2003

Geoffrey S. Dean

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Master of Science - Workforce Education and Development

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Bachelor of Science - Industrial Technology

Southern Illinois University at Carbondale  
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Southern Illinois University at Carbondale  
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Major Professor: Patrick A. O'Reilly

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1977 – 1984 Industrial Machine Tool System Engineer/Instructor/Consultant  
1984 – 1994 Aerospace Materials and Processes Research Engineer/Manager  
1994 – Present Education Researcher/Instructor/Consultant

## Publications:

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