DOCUMENT RESUME

ED 372 249   CE 066 862

AUTHOR   Grummon, Phyllis T. H.
TITLE   Evaluating Systemic Change in School-to-Work
              Initiatives.
PUB DATE   Apr 94
NOTE   13p.; Paper presented at the Annual Meeting of the
              American Educational Research Association (New
              Orleans, LA, April 1994).
PUB TYPE   Speeches/Conference Papers (150) -- Reports -
              Descriptive (141)

EDRS PRICE   MF01/PC01 Plus Postage.
DESCRIPTORS   Administrator Attitudes; *Adoption (Ideas);
              Articulation (Education); Attitude Change; Change
              Agents; Change Strategies; *Community Attitudes;
              Community Change; Community Colleges; *Consortia;
              *Educational Change; Educational Environment;
              Educational Policy; Education Work Relationship;
              Federal Regulation; High Schools; Longitudinal
              Studies; Outcomes of Education; Parent Attitudes;
              Regional Programs; School Business Relationship;
              State Regulation; *Systems Approach; Teacher
              Attitudes; Two Year Colleges; *Vocational
              Education
IDENTIFIERS   *Tech Prep; United States (Midwest)

ABSTRACT
              A longitudinal study examined the factors affecting
the long-term success of a midwestern tech prep consortium consisting
of one community college and four counties with a mix of rural,
urban, and suburban communities. The study was designed to identify
the effects of systematic change over time from the following
perspectives: students' skill gains; how and what teachers teach; the
broader school environment in which instruction occurs;
district-level, parental, and business support for tech prep; and the
impact of state and federal policies on local-level tech prep
programming. The following data collection methods were used: review
of historical documents; analysis of educational records; participant
observation; field observation of business classrooms in a high
school, comprehensive high school, vocational center, and community
college; surveys; and interviews. Six months after the study had
begun, a number of aspects of implementation of systematic change
were identified. The consortium seemed to be nearing the "takeoff"
point in the process of communicating innovation through specified
channels over time to members of the community's social system. Early
adopters of the tech prep system had discovered how to communicate
information about the program and had identified and enlisted the
support of key leaders. (Contains 20 references.) (MN)

Evaluating Systemic Change in School-to-Work Initiatives

Phyllis T. H. Grummon
Michigan State University

This study considers the range of factors that may influence the long term success of systemic reform related to education for employment. It presents the initial findings of a multi-year project to investigate the success of a specific school-to-work initiative (Tech Prep)in a community. It considers this change in light of the literature on the diffusion of innovations and the process of large scale system change.

Sometime in the last twenty years or so, the rules about how young adults move from school into employment changed. Prior to 1970, high school graduates and even those without a diploma, could expect to find employment relatively easily and to earn enough money to maintain a middle class existence. While this was most true immediately following World War II, the ability of youth to find well-paying work changed little until the late 1960s and early 1970s. What has happened since then, is that real earnings for high school graduates have fallen by an average of 28% (Education Writers Association, 1990; Policy Information Center, 1990). A pattern has emerged of youth between the ages of 16 and 25 finding employment primarily in low paying ($4.25 - $6.00 per hour) jobs in what is called the secondary labor market (Hamilton, 1990). While a young person may be employed full-time following high school in such jobs, it is virtually impossible to save money, start a family, or even move away from home. The shift from manufacturing to service sector jobs has meant that even those with a high school diploma are unlikely to find well paying work, while those without a diploma are very likely to be unemployed.

In addition to the loss of manufacturing jobs, those jobs that do pay middle class wages have changed too. By-and-large, far more skills, both academic and interpersonal, are needed to enter and advance in jobs. The ability to work with a variety of technologies, to use statistics and mathematics to analyze problems, to read and interpret complex manuals, and to work in teams are now routinely required in all sectors of the economy. Any number of surveys of employers, both formal and informal, reveal they are seeking employees with an ability to learn even more than those with any specific skills (Berryman, 1993; Carnevale, Gainer, & Meltzer, 1990; Mehrens, 1989). So, students leaving high school are likely to find that what they learned will be insufficient to allow them to enter more than a minimum wage job, essentially the same job they held in high school. Given that the majority of students either do not go on to postsecondary education or do not complete that education, the need for the educational system to respond is critical.

The problem of how to help youth successfully gain entry into the workforce is multifaceted. The policy emphasis has been on the development of programs to increase the skills of students leaving high school so they can obtain more "high skill, high wage" jobs (Grummon, In Press). Many of the public sector initiatives in this arena were created following research and reports from public study commissions (e.g.; W. T. Grant Foundation, 1988; Commission on the Skills of the American Workforce, 1990; Secretary's Commission on Achieving Necessary Skills, 1991). This research has been largely descriptive in nature. The programs developed from these reports have relied on programs developers' general sense of what might help students make the transition to work.

One specific initiative at the federal level was included in the 1990 Re-authorization of the Carl Perkins Act. The Tech Prep Education Act stated:

> "...in recognition of the recent changes in the labor market, and the challenge of worldwide economic competition, there is a significant need to prepare youths for success in the ever changing technological workplace. This preparation can be provided through a 4-year educational program grounded in the development of comprehensive instruction based on articulation agreements between secondary and postsecondary institutions." (pp. 38-39)

In fact, the Perkins Vocational and Applied Technology Education Act provided funding for a number of changes that were already taking place in school districts and community colleges around the country. Articulation agreements, such as 2 + 2 programs, had already begun to be negotiated between secondary and postsecondary institutions in many communities. What the Perkins Act brought to the table, however, were some clear expectations that articulation agreements would not be enough to create the type and quality of changes sought by the legislation. In order to truly meet the spirit of the law, and the changes desired by businesses and individuals, secondary and postsecondary institutions

3

would have to undergo systemic change. This change focuses primarily on the move from activity-based success in education (i.e.; the accumulation of Carnegie Units and student credit hours) to competency or skill-based outcomes. For Tech Prep to work as designed, postsecondary and secondary institutions must not only change how they instruct and assess students, they must also make decisions jointly that reflect those changes.

As presented in federal guidelines and interpreted by the state, Tech Prep has a number of required components (Dornsife, 1992). In Michigan, the site of this study, the state has emphasized the following components in its application guidelines to consortia; work-based learning opportunities, sequences of outcomes/skills for each occupational area, integration of academic and occupational instruction, professional development, Tech Prep integrated into other reform efforts, learner support, and educational development plans and portfolios for all students (Michigan State Board of Education, 1993).

Tech Prep, as a specific school-to-work initiative, takes place within the broader context of school reform. A district or school that is involved in Tech Prep is also likely to be working on some other form of systemic reform. The number and diversity of programs designed to help schools improve is readily apparent from reading either the popular or research literature. While each of these programs has a different slant on school reform, they tend to emphasize the need for students to engage in more contextualized, activity-based learning (e.g.; Berryman, 1993; Copa & Pease, 1992; Peterson & Knapp, 1993; Prestine & Bowen, 1993; Sizer, 1985, 1992). Thus, many of the practices advocated by school reform or school improvement are similar to the ones discussed in school-to-work initiatives. The state has recognized this and encouraged consortia to integrate the various initiatives as much as possible.

The Study

This paper presents the results of the first six months of a longitudinal study of one Tech Prep consortia in a Midwestern community. The consortium includes four counties with a mix of rural, urban, and suburban communities. The consortium includes a single community college. One county has been leading the efforts for integrating systemic change with Tech Prep and preparation for the workplace. That county has been the focus of initial data collection and serves as the pilot for methods to be used throughout the consortium in subsequent years.

In order to capture the effects over time of systemic change, this study looks at change from a number of perspectives (see Figures 1 and 2). First, students and teachers are the ultimate focus of most change efforts. As discussed above, one of the primary driving forces for programs is to help individual students gain skills for use in the workplace. How and what teachers teach, then, becomes the vehicle for imparting those skills. What curriculum they use, what instructional techniques, their background and commitment to preparation for the workplace, all become factors in determining if a school-to-work program will succeed. However, classroom instruction happens within the context of a broader school environment. Such factors as the support of the principal, the reaction of other teachers to changed instructional techniques, the resources available to the teacher (e.g.; equipment, counselors, professional development, etc.) and curriculum all affect what can and does happen in a classroom.

Outside of the building, district level support, parental support, and the make up of the Tech Prep consortium can all affect the ability of change to be initiated and sustained. For secondary school students, the support of the community college and the business community are also important. In particular, for Tech Prep, the overall philosophy of the community college and the level of commitment from faculty and top administrators affect how articulation between secondary and postsecondary learning occurs. The business community plays a role for both community college and secondary students. Local business involvement may come in a number of ways, including collaboration on curriculum development, guaranteed jobs, internships, apprenticeships, or other skill development activities. At a minimum, local businesses must confirm for students that the skills being taught in

classrooms are in fact ones they will use for selection. Finally, state and federal policies affect how Tech Prep is enacted at a local level. Funding for local initiatives comes from federal sources. State agencies are charged with distributing funds, establishing monitoring practices, coordination of efforts, and generally interpreting federal guidelines to enable consortia to meet federal requirements for funding.
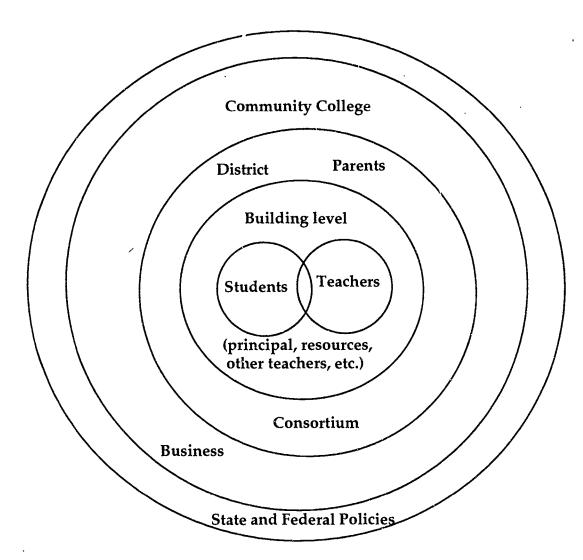
Community College

District   Parents

Building level

Students Teachers

(principal, resources, other teachers, etc.)

Consortium

Business

State and Federal Policies

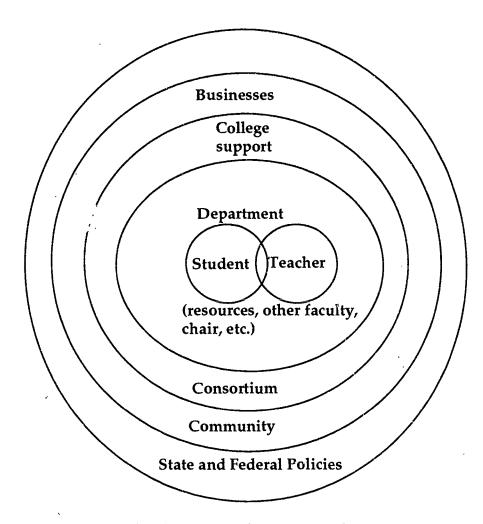Figure 1: Evaluation Factors in Secondary Tech Prep

Figure 2: Evaluation Factors in Postsecondary Tech Prep

In order to understand how systemic change is enacted, information was and will be collected at each of these levels. Data collection methods include review of historical documents, analysis of educational records, participant observation, field observation, surveys, and interviews. The methods used vary depending upon the level of the system under analysis and the type of information available. It is expected that over time a rich and complete record will be constructed of the ways in which Tech Prep has evolved in this consortium. While those interested in reform have often looked at one piece of the system, rarely have studies attempted to gather data from each of those pieces (Wang, Haertel, & Walberg, 1993). It is hoped that by paying attention to the many factors that impinge on the effectiveness of a reform effort, the study will be able to shed light on how those factors interact and which factors may be more powerful. Given that, it is critical to note that time plays a key role. Factors that may be important at the start of the reform process, may not be as significant after a period of time. The diffusion of innovation literature would support time as a vital dimension in any change process (Rogers, 1983).

Classrooms

Four different classrooms are being observed as part of this study. The classrooms represent the range of settings in the consortium where Tech Prep is being enacted for students and teachers. They are an applied mathematics class in a high school, a business class in a comprehensive high school (i.e. a high school that offers vocational instruction on its premises), a business class at the vocational center, and two business classes at the community college. The classrooms are all part of the business occupational cluster in the Tech Prep consortium. Each of the teachers has been involved in the consortium's business curriculum restructuring process for the past year. They are considered exemplary teachers by the consortium's Tech Prep coordinator and were recruited on that basis. Part of that view of the teachers is based on their involvement in the business curriculum team. They have also received additional professional development, and in some instances, visited a school in Colorado that is considered a model for what the consortium is attempting.

Each high school classroom will be observed for one week. The business classes at the community college will be observed over the course of two weeks. Two observers will take field notes and tapes of the activities in the classrooms. They will be using the typology developed by St sz, Ramsey, Eden, DaVanzo, Farris, and Lewis (1993) for coding field notes. This method was developed in observations of vocational classrooms trying to teach generic skills and has direct relevance to the goals of Tech Prep. Some of the codes will be modified for the community college classrooms (e.g.; postsecondary focus). Notes will also be made related to the classroom environment. These will include attention to the factors listed below.

°What is the physical design of the classroom? How flexible is it?
°What is the environment of the class (social interactions, task behaviors, etc.)?
°What resources are available to the class (books, materials, people, equipment, etc.)?
°How are resources used by students? teachers? others?

In addition to observations, students in each classroom will be asked to complete a brief questionnaire. The questionnaire includes items on their plans after graduation, preferred learning styles, how they use skills learned in the class, and their present employment. Teachers have each had a brief preliminary interview and will be interviewed more extensively following classroom observations. Interview questions will include:

°How does the teacher approach teaching? (philosophy of teaching, pedagogy)
°What are the teacher's instructional tactics and strategies?
°What are the teacher's goals, as perceived by the teacher?
°On what knowledge, skills, and attitudes does the teacher focus instruction?
°What are the teacher's learning expectations for students?
°What strategies does the teacher use to help students think about non-school applications for what they are learning?
°What specific instructional work does the teacher expect students to accomplish?
°How does the teacher evaluate the students?
°What is the teacher's experience (work history)?

Information from the interview will be considered in light of the classroom observations to gain a sense of how the teacher's actual classroom practices reinforce or detract from their stated goals.

Each of these classrooms is located in a different building and district, or in the case of the community college, a department under a dean. The support that teachers receive in the classroom and the general support for Tech Prep in the school or college may affect the likelihood that the teachers will continue to be involved in innovative instructional practices (Prestine & Bowen, 1993). Interviews and participant observations will be the primary methods of data collection during the pilot phase. Interviews will be conducted with principals, counselors, and teachers identified as supportive of Tech Prep, neutral, or unsupportive. The goal of these interviews will be to gauge how Tech Prep is perceived in the specific settings, as well as the overall level of resources available in the school/college to support Tech Prep activities (e.g.; counseling, computers, labs, professional development time, etc.).

The role of the Tech Prep coordinator is also key to the initiation and maintenance of Tech Prep as an innovation. In the case of this consortium, there are really two people who function in the role, one formally and the other informally. The official coordinator works at the community college. The 'informal' coordinator works at the intermediate school district. Both individuals have been interviewed and will continue to be key informants throughout the research.

The environment outside the building or department also may affect how Tech Prep is enacted and its ability to sustain itself as an innovation (Rogers, 1983; Prestine & Bowen, 1993). The support of superintendents, deans and presidents, parents, and the larger Tech Prep consortium may all play a role. The county in which the school districts are located has formed a special advisory group to help oversee the integration of such efforts as Tech Prep across the county. This group consists of representatives of each district in the county and includes superintendents, assistant superintendents, and curriculum specialists. Each member of this group will be interviewed and records of their meetings since the inception of the group two years ago are being reviewed for key events and decisions. Interview questions will be similar to the ones conducted with principals. The dean of the community college responsible for the business class being observed will be interviewed, as will be the president.

In the case of Tech Prep, support of the local business community and parents is vital for its success. Parents must be willing to view a future for their children that does not necessarily include a four year degree. Like students, they must be able to accept that academic performance in high school has a direct bearing on students' future job prospects. Marketing Tech Prep, to parents, students, and businesses is considered a key component by the state. As described above, businesses also can play a significant role in the ultimate success of a Tech Prep program. In this consortium, local business representatives worked with teachers in restructuring the business curriculum. Business and parent representatives will be interviewed during the study to ascertain their perceptions of Tech Prep and education for employment in general.

The final supporting structure to be considered is the role of state and federal policies related to Tech Prep and school-to-work. While Wang, et al. (1993) have indicated that these tend to play a peripheral role in student achievement, they are likely to be more central in the enactment of Tech Prep. The federal government established the concept of Tech Prep in its re-authorization of funds under the Carl Perkins Act. The recent passage of the School-to-Work Opportunities Act has created what may be either a rival or complementary initiative. It is unclear at this point how the consortium under study will respond to this new program. The two programs, however, are administered out of different state agencies, so it is likely that at least some conflict will occur. How such conflicts are resolved may affect the degrees of freedom that local consortia have in developing Tech Prep and other school-to-work initiatives.

Results

A number of aspects of the implementation of a systemic change have been revealed through initial data collection efforts in one county. The importance of a visionary leader has been particularly apparent. Through interviews and review of historical documents, it is becoming clear that without the involvement of the 'informal' Tech Prep coordinator, the implementation of Tech Prep might look very different. This leader has considerable longevity in the community and the intermediate school district. He helped to start the vocational center and acted as its principal until two years ago. At that time, he took a position as an assistant superintendent in the intermediate school district with the goal of promoting a broader acceptance of education for employment. He will retire at the end of June, but plans to continue working one-third time on this initiative. How his retirement will affect the implementation of the Tech Prep remains to be seen. However, he has worked to promote the involvement of as many people as possible along the way so that he is not see as the sole driver of the change.

This leader has identified a number of strategies for encouraging systemic reform, which he sees as going beyond the need for education for employment. M. has taken over 85 school personnel from the county to a site in Colorado which serves as a model for how they see their schools being restructured. This model includes hands-on technology laboratories, active learning strategies, and integrated academic instruction. This has enabled a significant number of teachers to literally see the vision and to own it for themselves. M. has worked with a variety of committees to ensure that professional development opportunities support this vision of a restructured school. He has brought in national speakers and sponsored consultants to work on such issues as assessment. He identifies readings and broadly circulates them. M. also realized that just bringing in speakers and sponsoring workshops could not sustain change at the building level. So, he began facilitating teams of teachers, such as those involved in restructuring the business curriculum, on a regular basis. M. is the chair of the Superintendents Advisory Council (SAC), the group that acts to integrate initiatives across the county, including special education, drug-free schools, infants and pre-school programs, technology education, and Tech Prep.

The SAC described the history of education for employment in a focus group session that highlights the breadth with which the county is approaching the initiative. As they began the discussion of this history, the group identified a single event as the trigger for interest in education for employment, a presentation by a business owner to the county's school board association in 1990. They perceived that the presentation triggered discussions among superintendents about the problem of students leaving school without a job and no plan for further education. It soon became apparent to the group, however, that while the presentation may have been the catalyst, prior events and activities had laid the groundwork for an interest in education for employment. Some of those events/activities included a manufacturing business task force, a Business-Education partnership, and work in individual buildings and classrooms to bring business and education closer together. One assistant superintendent identified a state initiative from the early 1970s that focused on career education and life role competencies as being a precursor for thinking about how schools help prepare students for the workplace. Important to moving the ideas in the community and schools into reality was the funding of positions at the intermediate school district starting in 1989. These positions include ones for coordinating efforts to restructure academic subjects (mathematics initially), work with Business-Education Partnerships, and technology education and career guidance.

One of the primary foci for change has been the introduction of technology education and the concomitant use of technology in applied learning across the curriculum. In the fall of 1990, the superintendents of the ten school districts in the county agreed to introduce technology education (similar to that in the Colorado model) and computer labs to the middle schools. The intermediate school district provided funding for the purchase of technology labs. Three relatively small districts started the process in 1991-92. In 1993-94, six more districts committed funds and space to the building of labs, including the largest district in the county. The last district, the wealthiest, will build

their lab in 1994-95. The SAC perceives that the changes in learning at the middle school (i.e.; introduction of learning labs, integrated technology education, professional development of teachers) as being completed by the end of the 1995-96 school year. Their hope is that the changes in the middle school will act to push the high schools to change. The believe that middle school students, who have been taught more interactively, and their parents will force the high schools to change.

The SAC has more concerns about changing instructional practices in the high school than in the middle schools. They anticipate those changes taking four to five years. Issues of certification, staff development, the phasing out of present courses, and how to structure access to computer labs (e.g.; centrally, by content areas) all must be confronted. Unlike the middle schools that had a fairly uniform curriculum and introduction process, they see each high school as needing a unique plan. Funds for computers and redesign of schools have been committed by local districts and the intermediate school district, so it is likely that the changes will actually proceed.

The Superintendents Advisory Council identified factors for success that were similar to those used by the visionary leader. They stressed the importance of early staff development, as well as committing sufficient time to planning and preparing for change. Other factors they indicated were; important for the success of systemic reform were a clear vision, key people (e.g.; administrators, superintendents, etc.) were committed visibly to the changes, that people (change agents) spend sustained time with teachers working in teams after staff development workshops, and that there be enough people who believe in the change so that the loss of key people does not create too many problems.

Initial discussions with faculty and staff at the community college indicate that there is much less awareness of the specifics of Tech Prep and the types of changes being sought by K-12 districts. In part, the community college has always been committed to education for employment through its occupational education program. Thus, there is a belief that they are already doing what they need to. Where there is ongoing discussion about change is in how to recognize the increased skills of students who have completed Tech Prep in secondary school as they enter specific community college courses and programs. Discussions are occurring about whether to offer credit or create higher level courses for such students. Since Tech Prep graduates are likely to always represent only part of the college's enrollment, the college will not be changing as much as the secondary schools. At this point, however, the involvement of the community college's faculty in professional development or awareness of Tech Prep has been limited primarily to the Department of Office Administration, the Tech Prep Coordinator, and the Dean of Applied Arts and Sciences. The Tech Prep Coordinator has been working successfully with at-risk populations (chronically unemployed) using Tech Prep models.

Informal observations in the classrooms have been limited. Two of the high school classrooms use computer software to teach students business practices. One classroom also has an ancillary teacher to supplement instruction on mathematics. Instruction is focused on skill acquisition in these classrooms and the teachers individualize programs through a sequence of modules that must be mastered. One teacher described the students as largely unmotivated until they become seniors and realize they need to have skills after graduation. The other teacher did not identify that as an issue. The applied mathematics class uses the CORD (Center for Occupational Research and Development) material. This classroom is of interest because most of the students have been together for two years with the same teacher. The community college classrooms have not been observed yet. One takes place during the day and one at night which gives them different populations of students.

Discussion

The results of initial data collection seem to indicate that this county is nearing or at the point in the diffusion of innovation process called "take off" (Rogers, 1983). Rogers (1983, p 10, emphasis in original) defines diffusion as "the process by which (1) an *innovation* (2) is *communicated* through certain *channels* (3) *over time* (4) among the members of a *social system*." Early adopters, including the visionary leader, have found ways to spread information about the innovations (e.g.; changed instructional strategies, use of technology in learning, need for technology education, applied learning strategies, etc.) throughout the districts of the county over the past two years. A variety of techniques have been used. The three principal ones are showing people a model (trips to Colorado), staff development, and sustained facilitation of teams of teachers/school personnel working on the change.

In addition to communicating more generally about both the need for change and the types of change sought, the change agents have also identified and enlisted the support of key leaders. Discussions of systemic reform identify the importance of not just a critical mass of teachers, but also the support of leaders for the success of a change (Prestine & Bowen, 1993). The problems that can arise when such leaders leave a district were also identified. Fortunately for most districts, administrators tended to be stable and/or to be promoted from within the district from people who were already committed to the change. The personnel interviewed, however, all indicated the need to continue to broaden the base of support for the innovation, particularly among community and business leaders.

Future research activities will focus on a number of issues. First will be the extent to which innovations are actually enacted in classrooms. While teachers may receive staff development and be committed to changing their instructional practices, there are a number of environmental factors that may inhibit that happening. Students are not generally accustomed to more active/constructivist learning strategies and so create a "pull" for more familiar practices. The physical layout of most classrooms, as well as scheduling of classes, make it more difficult to engage in applied learning. There are no schools where all of the teachers are committed to, or familiar with, the changes being sought. This creates tension among those who are trying new practices and those who prefer more familiar techniques. Depending upon the influence level and number of adopters, non-adopters may present a significant barrier to adoption of the innovation. Thus, it will be important to continue to observe the teachers who have initially volunteered for the study as additional teachers are enlisted in different subject areas.

As important as the extent to which innovations actually appear in classroom practices will be the rate at which changes are adopted across schools within the county and across the four counties and community college within the consortium. The rate at which the innovation will diffuse is likely to depend not only on the number of adopters, but also such factors as support from state and federal policies, the business community, parents, and even the national and international economy. While we like to think of change as orderly and planned, in fact it can often be affected by serendipitous events outside of the control of change agents or planners. Thus, this research will also attempt to monitor and measure the effects of changes in the outer shells of Figures 1 and 2 as they affect the planned changes in the consortium.

A final note, this research is only in its preliminary stages. Just as those involved in the innovation understand that it will take many years to realize their vision, so too, the results of those efforts and the processes by which they were achieved will not be revealed until much more data is collected. By working with the those involved in the change, we hope that our research can help them make informed decisions about their activities, as well as contributing to the general knowledge about how large scale change becomes enacted at all levels of the system.

References

Berryman, S. (1993). Learning for the Workplace. In Darling-Hammond, L. (Ed.)Review of Research in Education: Volume 19 (pp. 343-404). Washington, DC: American Educational Research Association,

Carnevale, A.; Gainer, L.; & Meltzer, A. (1990). Workplace basics: The essential skills employers want. San Francisco, CA: Jossey-Bass

Commission on the Skills of the American Workforce. (1990). America's choice: High skills or low wages! Rochester, NY: National Center on Education and the Economy

Copa, G. & Pease, V. (1992). New designs for the comprehensive high school: Volume I. Berkeley, CA: National Center for Research in Vocational Education.

Dornsife, C. (1992). Beyond articulation: The development of Tech Prep programs. Berkeley, CA: National Center for Research in Vocational Education,.

Education Writers Association. (1990). First jobs: Young workers in a changing economy. Washington, DC: Education Writers Association.

Grummon, P. (in press). The transition from school to work. In Grummon, P. & Mullan, B. (Eds.) Policy Choices: Framing the Debate for Michigan's Future, Volume II. East Lansing, MI: Michigan State University Press.

Hamilton, S. (1990). Apprenticeship for adulthood: Preparing youth for the future. New York: The Free Press.

Mehrens, W. (1989). Michigan Employability Skills Technical Report. East Lansing, MI: Michigan State University (William Mehrens).

Michigan State Board of Education. (1993). Tech Prep education implementation guidelines. Lansing, MI: State Board of Education.

Peterson, P. & Knapp, N. (pp. 134-157). Inventing and reinventing ideas: Constructive teaching and learning in mathematics. In Cawelti, G. (Ed.) Challenges and achievements of American education. Alexandria, VA: Association for Supervision and Curriculum Development, 1993.

Prestine, N. & Bowen, C. (1993). Benchmarks of change: Assessing essential school restructuring efforts. In Educational Evaluation and Policy Analysis, 15, 298-319.

Policy Information Center. (1990). From school to work. Princeton, NJ: Educational Testing Service.

Rogers, E. (1983). Diffusion of innovations (3rd ed). New York: The Free Press.

Secretary's Commission on Achieving Necessary Skills (SCANS). (1991). What work requires of schools: A SCANS report for America 2000. Washington, DC: U. S. Department of Labor.

Sizer, T. (1992) Horace's school: Redesigning the American high school. Boston, MA: Houghton-Mifflin.

_____ (1985) Horace's compromise: The dilemma of the American high school. Boston, MA: Houghton-Mifflin.

Stasz, C.; Ramsey, K.; Eden, R.; DaVanzo, J.; Farris, H.; & Lewis, M. (1993). Classrooms that work: Teaching generic skills in academic and vocational settings. Berkeley, CA: National Center for Research in Vocational Education.

Wang, M.; Haertel, G.; & Walberg, H. (1993). Toward a knowledge base for school learning. In Review of Educational Research, 63, 249-294.

W. T. Grant Foundation Commission on Work, Family and Citizenship. (1988). The forgotten half: Pathways to success for America's youth and young families. Washington, DC: W. T. Grant Foundation.

13