

2. WORK FORCE QUALITY: THE KEY TO A COMPETITIVE ECONOMY

2.1 THE IMPORTANCE OF A QUALITY WORK FORCE

Competitive forces are generating demands for more skilled, adaptable workers. Oregon currently faces labor shortages in some high skilled occupations. In coming years these shortages will grow more widespread and acute without strong education and training programs that anticipate the needs of our economy. To be successful in the new economic environment, Oregon workers will need: 1) a solid foundation in the skills basic to an advanced competitive economy -- the ability to think analytically, solve problems, communicate and listen, adapt to new requirements, manage oneself, and learn, 2) the ability to move between education and employment, and 3) the ability to master and apply a variety of specialized skills.

As a result of these present and future needs, the role of education and training programs in economic development is becoming increasingly important. The skills demanded include but go significantly beyond the basic academic skills schools traditionally have been called upon to teach. In addition, not only must Oregonians possess higher levels of skills, but more Oregonians must achieve these levels.

For Oregon's overall economic health, and for the future opportunities of individual Oregonians, work force education must be a top priority well into the next century. If Oregon is to achieve a vision of providing innovative products to world markets and raising per capita income, the state will require a more highly skilled work force capable of functioning in a knowledge intensive economy and adapting quickly to economic change.

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There is mounting evidence that manufacturing and service sectors of the economy increasingly require workers who have high skill levels, who are able to handle complex technology, who can communicate effectively, and who can solve complicated problems. Routine jobs that pay high wages but require low skills are disappearing as standardized production moves to nations with relatively inexpensive labor.

The Hudson Institute and the U.S. Department of Labor estimate that the median level of education required for newly created jobs is 13.5 years, compared with 12.8 years for existing jobs. They estimate that 52 percent of new jobs will require post-secondary education, compared with 42 percent for existing jobs.

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Oregon's performance is consistent with national trends. In *Oregon Workforce 2000*, the State Employment Division notes that through production process restructuring during 1979-1986, 40,000 low skilled jobs were permanently lost. This shift in Oregon's occupational mix has greatly reduced the employment prospects of Oregonians with no more than a high school diploma, who historically have enjoyed a good standard of living.

Skills the Economy Needs

The Economic Development Department recently surveyed employers from across Oregon for their views on what they value and need in workers. Employers listed all skills inventoried (from reading, writing, and mathematics to initiative, problem solving, willingness and ability to learn, and listening skills) as "important" to "very important" to job performance in high skilled occupations (professional, technical, and skilled crafts). In addition, they listed continuing education as very important for those occupations. Among *all* occupations, employers uniformly placed high value on skills traditionally associated with a broad liberal education: willingness and ability to learn, and listening skills.

In short, confronted with the changes in the national and state economy, those who possess good foundation skills and are adaptable will be well positioned to earn a good living. In addition, workers must build on these qualities by developing high levels of specific skills needed by employers. Those without such attributes and without access to responsive education and training programs will likely face declining wages as low skilled production jobs move to low-wage nations.

Therefore, if a major goal of economic development is to increase the incomes of Oregonians, education and training must play a key role. States that have a highly skilled, adaptable work force are much more likely to grow and attract industries that pay well in the future.

U.S. Skill Deficiencies

Meeting the work force challenge will not be easy. There is ample evidence that the United States is behind other nations in educational attainment in several key areas, including math and science, literacy, and problem solving skills. Comparative achievement data displayed in Tables II-2 and II-3 and in Figures II-1 and II-2 make clear the extent of the problem. Informal measures, including technical skill competitions and production quality measures, indicate that the U.S. deficiency extends to specific occupational skills as well.

Table II-2. Profile of literacy levels among young adults in the United States. Most can't read a bus schedule, compute a restaurant bill, or describe the main point of a newspaper column.

Scale measure (percentage of test population answering correctly)	Prose Literacy: Understand and use information from texts that include editorials, news stories, poems, and the like.	Document Literacy: Locate and use information contained in job applications or payroll forms, bus schedules, tables, and so forth.	Quantitative Literacy: Apply arithmetic operations, either alone or sequentially, to figures embedded in printed materials.
150 (99%)		Locate the expiration date on a driver's license.	
200 (96%)	Locate a single fact in a newspaper article of moderate length (170 words).	Enter personal information on a job application	
225 (92%)			Total two entries on a bank deposit slip.
250 (84%)		Locate a particular intersec- tion on a street map	
275 (72%)	Intrepret warranty instructions and choose the best descrip- tion of what is wrong.		Balance a checkbook with a beginning entry, one deposit, and one withdrawal.
300 (57%)		Follow directions using a street map to travel from one location to another.	
325 (37%)	Synthesize the main argu- ment from a lengthy newspa- per column (700 words).		Compute the cost of a meal and the change due from a specified payment.
350 (21%)		Choose correct bus departure based on time, date, location, destination and schedule information	
375 (10%)	Use text information to de- scribe orally the distinctions between two types of em- ployee fringe benefits.		Select the least costly product based on unit pricing informa- tion.

Source: Literacy: Profiles of America's Young Adults Irwin Kirsch and Anne Jungeblut, Princeton, N.J.: National Assessment of Educational Progress/Educational Testing Service, 1986

Table II-3. Comparison of science achievement of grade 12/13 students in 13 countries.¹ U.S. students are at the back of the chase.

	<u>Biology</u>	<u>Chemistry</u>	<u>Physics</u>	<u>Overall</u>
Highest	Singapore	Hong Kong	Hong Kong	England
	England	England	England	Hong Kong
	Hungary	Singapore	Hungary	Singapore
	Poland	Japan	Japan	Hungary
	Hong Kong	Hungary	Singapore	Japan/Poland (tie)
	Norway	Australia	Norway	
Median	Finland	Poland	Poland	Norway
	Sweden	Norway	Australia	Australia
	Australia	Sweden	<u>U.S.A.</u>	Sweden
	Japan	Italy	Sweden	Finland
	Canada	<u>U.S.A.</u>	Canada	<u>U.S.A.</u>
	Italy	Canada	Finland	Canada
Lowest	<u>U.S.A.</u>	Finland	Italy	Italy

¹ Source: *Science Achievement in Seventeen Countries: A Preliminary Report*. International Association for Evaluation of Educational Achievement (IEA), New York: Pergamon Press, 1988.

Figure II-1. 12th grade achievement in elementary functions and calculus. U.S. students place fourth from last in second international mathematics study.²

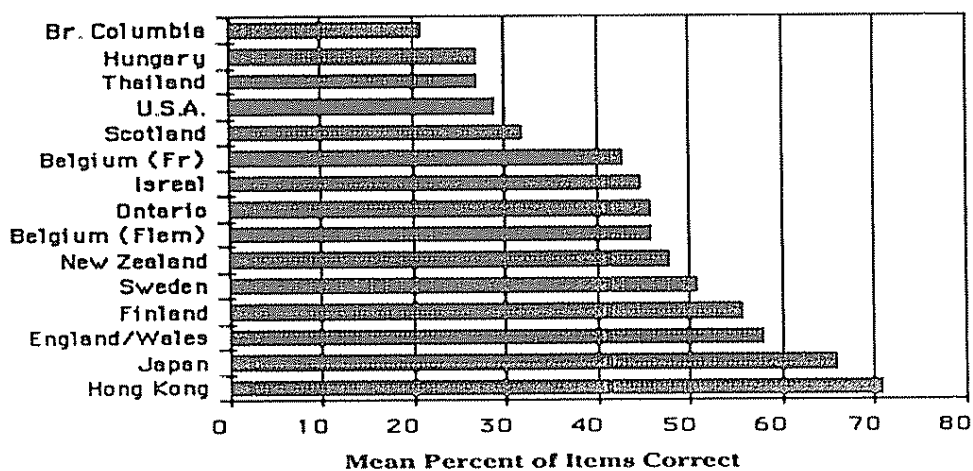
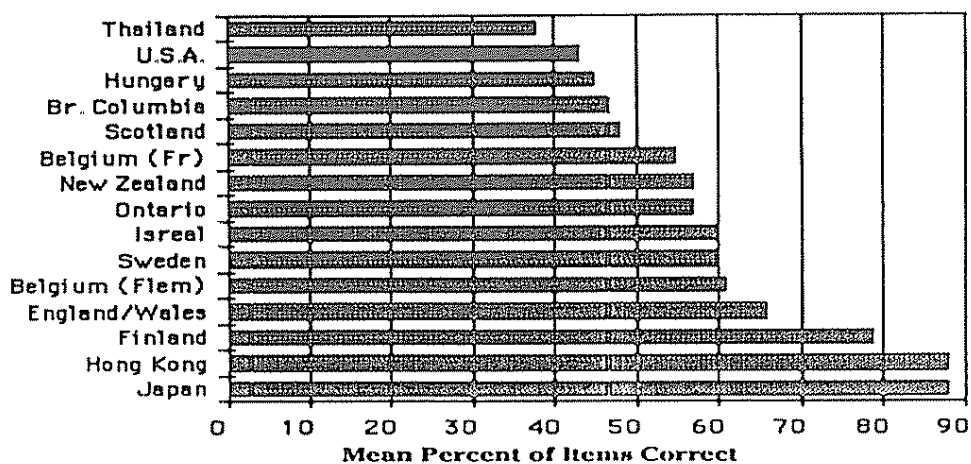


Figure II-2. 12th grade achievement in algebra. U.S. students place next to last.



² Both charts from *The Underachieving Curriculum: Assessing U.S. School Mathematics from an International Perspective* Curtis C. Knight, et al Champaign, Ill: Stipes Publishing Co., 1987.

The Demographic Challenge

The problem of training workers will be compounded by impending demographic shifts. Between 1985 and 2000, the number of Oregonians 15 to 24 years old will rise only modestly (nationally, this group will shrink), while the number 40 to 55 years old will rise dramatically. The composition of those entering the work force will also change. Increasing numbers will come from disadvantaged households, and will bring with them a much greater risk of education failure.

Therefore, successful work force development must be based on a strong, coordinated effort to include and nurture those from demographic groups historically characterized by lower educational and economic achievement (for example, immigrant Hispanics, children of teenage or single parents, and children born into poverty).

Educating children from these groups will require a broader view of how the social services can support learning. For example, very young children from high risk families need services ranging from pre- and neo-natal care to preschool support and preparation which gives them a start in life on a footing close to their more advantaged peers. Both preschool and older children may require more intensive support in dealing with parental neglect or abuse, drug and alcohol abuse, and other problems of poverty and family disfunction. Within the schools such students also require more support and encouragement to keep them from dropping out and to keep them committed to educational achievement.

We must pay particular attention to upgrading the skills of those already in the work force. These workers will make up 75 to 80 percent of the work force in the year 2000, and many of them will require extensive skills upgrading or retraining in order to keep pace with rising work place skill requirements or to move from declining low skilled occupations to fast growing higher skilled positions. As fewer youth come into the labor market, and as the number of low skilled jobs shrinks, retraining displaced workers will be critical for the futures of those workers and businesses with skilled labor needs.

Harnessing Education Resources

Education is the largest function of state and local governments in Oregon: fully half of all state and local tax revenues are dedicated to education. These resources are distributed among a wide variety of institutions and programs which have been established and developed over Oregon's history to serve the needs of specific populations. Currently, however, our huge investment in these systems is not managed most effectively. We place a high value on education, and we know that educational achievement and skill levels correlate strongly with individual economic success. However, we do not consider whether the current allocation among levels, institutions, or programs best meets existing or emerging state needs, or would

promote economic development.

Producing a highly skilled, adaptable work force will be a formidable challenge calling for a more comprehensive view of what is needed in education and training. It will require a greater understanding of the relation of education policies and programs to economic development. It will require an education system which establishes goals reflecting what Oregonians need from it. And it will require us to aggressively pursue those goals, and to evaluate our progress toward them.

The foundation for a concerted education effort is partly in place. We already place a high value on education, funding it at a level above the national average despite a per capita income which falls substantially below the national average. In addition, many citizens across the state are helping develop such youth programs as the Children's Agenda and the Student Retention Initiative. These programs take the form of local citizen initiatives to improve early childhood preparation for schooling, to support students' efforts to learn, and to counter the factors which put them at risk of educational failure.

On a broader level, however, our education policies and programs lack adequate coordination. The Legislature created an Educational Coordinating Commission (OECC) in 1975, with a policy staff to support its work, but it did not have the institutional clout to address effectively major education strategy and policy issues. The 1987 Legislature established the Office of Educational Policy and Planning as an executive agency and directed it to initiate policies to improve education statewide and systemwide. As an executive agency, it is much better positioned than was OECC to raise education policy issues for discussion.

Education systems (grades K-12, community colleges, four-year institutions) function largely independently of one another, except through ad hoc or informal ties between individual institutions. More often than not, policy recommendations regarding resource allocation or program delivery are based on an institution or system perspective rather than a statewide or intersystem perspective. Program and resource allocation choices reflect historical roles and funding formulas. The current structure is not sufficiently responsive. To the degree that it is not, it directly inhibits our ability to meet changing education and work force needs.

Assessment measures in Oregon reflect the education system's lack of policy direction or integration and its present inability to determine and respond to changing state needs. In nearly all cases, assessment of student progress and school performance reflects neither the relationships among education systems nor work place concern over desirable employee skills. State and local governments have few reliable ways to monitor the performance of education institutions and systems. Indicators of student progress and coordination between educators and employers

are inadequate, and they vary among regions and systems of education. As a result, they cannot be used to develop policies which will address the state's education needs.

Vision

Oregon will build a work force which is measurably the best in the United States by the year 2000, and second to none in the world by 2010. Oregonians will see education as a lifelong process closely connected to employment. Individuals will appreciate the importance of education to individual economic opportunity, including the role of periodic specialized training and retraining. Schools and businesses, through joint efforts, will effectively inform students of nontraditional career training programs. As a state, we will appreciate the importance of investment in education as a concurrent investment in development and maintenance of Oregon's economic infrastructure.

Our education system will effectively prepare people for economically productive lives. Schools and businesses will work together to 1) ensure the continued relevance of school curriculum, 2) more firmly establish the connection between education and employment for students in all programs, 3) provide effective career education, and 4) smooth the transition between school and work. Schools at all system levels will offer programs which meet the differing learning needs of students. Parents, community groups, schools, social service agencies, and businesses will support early childhood development and students' efforts to learn and to complete school. Schools will expand current exemplary offerings in foreign languages and cultures, helping to make Oregon an international culture.

State Government will regularly measure the work skills of Oregonians and analyze economic, demographic, technological, and social trends affecting work place skill requirements. Education policy coordination will significantly develop the relationship between business and education. Coordination will also employ the resources of social service agencies in a way which better enables children of all ages and backgrounds to develop physical and emotional health and to learn essential skills.

Strategy To Achieve the Vision

Work force development is, at its core, human development, and must include programs which address needs from birth through retirement. In its fullest sense, work force development includes pre- and post-natal care, early childhood development, elementary and secondary education, career counseling and school-work transition programs, two- and four-year post-secondary education, trade and professional programs, adult basic education, worker training and skills upgrading, and graduate and post-graduate study.

Just this list of components illustrates amply that building a work force second to none is a complex and far-reaching challenge. Because this challenge involves such a variety of programs, all of which serve other significant purposes, this strategy calls for central *leadership* and coordination rather than central *control*. It requires an expansive view of the issues confronting education. It requires involvement of not only all education systems, but also many other groups and individuals including parents, community organizations, social service agencies, and businesses. The recommendations below summarize a long-term program which broadly addresses these requirements. Following the recommendations are several action items which respond more specifically to immediate program needs identified in this section.

Great Start: Early Childhood and Pre-education Development

- Increase funding for pre-natal and early childhood parenting classes and health care services.
- Fund and promote Children's Agenda programs in communities statewide.
- Expand Head Start and other proven education preparation programs.

Ready to Work: Education Through High School To Meet Student and Employer Needs

- Support continuing efforts to stabilize school funding and make it more equitable among Oregon communities.
- Support the Student Retention Initiative and similar programs to help students overcome learning obstacles which arise outside of school. Set a goal to graduate 90 percent of our high school students by 1991.
- Build more extensive business-education connections in communities statewide through such initiatives as teacher-worker exchanges, advisory board participation, and internship programs.
- Insure that curriculum prepares students for future economic opportunities through definition of specific work force skills; through stronger mathematics, science, and technology curriculum; and through greater emphasis at all levels on foreign language and culture.
- Restructure classroom processes to develop skills needed in the work place.
- Provide programs which better serve diverse student needs and learning styles, including:
 - Expanded use of complementary and transitional programs between high

schools and community colleges

- Reconciliation of academic and nonacademic student curriculum priorities
- Expanded availability of alternative high school programs and apprenticeships.
- Expand and emphasize career education programs.
- Fund a pilot project demonstrating the costs and benefits of a longer school day and year, combined with stronger curriculum content. The project should be based on the standards, results, and experiences of European, Asian, and model U.S. systems.

Beyond High School: An Enduring Education-Employment Link

- Strengthen Oregon State System of Higher Education (State System) planning by defining individual institutional missions based on statewide needs and budget realities.
- Expand employer awareness and use of community college training programs and capacities.
- Strengthen and expand community colleges' small business development and management programs to include Pacific and international marketing programs.
- Expand post-secondary institution coordination with employers to provide structured work experiences.
- Strongly support current efforts to coordinate State System, community college, and private institution delivery of post-secondary education services in the Portland metropolitan area.
- Work with employers, social service agencies, and education institutions to more fully include adult literacy, basic education, and continuing education in education services planning statewide.

Building Oregon's Economy of the Mind

Achieving the general goal of linking education to business needs and to economic development goals will require coordinated management of the agendas outlined above and the system as a whole. The following management proposal will provide both leadership and policy coordination to achieve this vision for Oregon.

- Through the Governor's Office and the Office of Educational Policy and Planning, provide leadership on education issues, including:
 - The growing importance of education to individual economic opportunity and the prosperity of Oregon
 - The breadth of education issues and opportunities for parental, community, business, and other citizen involvement.
- Develop and conduct an annual or biennial assessment of the work force skills of all Oregonians.
- Coordinate programs statewide and among education systems, agencies, and other groups:
 - Continue efforts to integrate high school and community college vocational education programs statewide.
 - Establish continuing community college-State System planning to reconcile regional and statewide missions and education service delivery, and transfer of academic credits among institutions.
- Manage Oregon's investment in education more efficiently and effectively:
 - Intensify efforts to link education policy and planning to statewide priorities, needs, and resource availability.
 - Among all Oregon education agencies, develop system, level, and institution goals, to be evaluated according to broad-based sets of performance indicators.
 - Coordinate work force testing with education system indicators and with national and international assessments.

Action Items

- The Office of Educational Policy and Planning and the Economic Development Department will begin development of a work force skills assessment program:
 - In the spring OEPP and the Economic Development Department will convene a small working conference to examine technical questions associated with the assessment (e.g., skills definition, feasibility, testing techniques, and logistics). Participants will include select representatives

of Oregon education and training resources and nationally recognized testing experts.

- In autumn a large work force skills conference will be convened, sponsored by the Governor's Office, presenting a testing program proposal for review and discussion. Participants will include school administrators from across Oregon, State education and training agency representatives, interested school officials from other states, representatives of federal and national education organizations, and employers.
- The Governor's Office will request funding for Children's Agenda programs, and will continue to support and recognize local communities' efforts.
- The Office of Educational Policy and Planning and the Economic Development Department will work with the Department of Education on a process by which the results of the work force assessment project and other research can guide curriculum development and classroom teaching approaches.
- The Economic Development Department will expand the roles of industry groups during the strategic planning process and create new industry groups as appropriate to facilitate communication between employers and education agencies and institutions.
- The Governor, with the assistance of the Office of Educational Policy and Planning and the Economic Development Department, will sponsor a series of conferences statewide to engage education, business, labor, and social service leaders in a broad-ranging discussion of steps needed to be taken to build the highest quality work force possible. The conferences should develop specific suggestions for education, social service, and business change that will serve these goals.
- The Division of Vocational Education, the Office of Educational Policy and Planning, and the Economic Development Department will commission a thorough outside study of vocational education, apprenticeship, and other employment and training programs in Oregon. The study will include the Employment and Training Policy Board Report. The study will also examine the training programs of other states and countries and evaluate Oregon's programs with respect to: 1) the role of those programs in economic development and education policy and planning, 2) the percentage of the work force trained through those programs, 3) the number and variety of occupations covered by the program, and 4) employer and administrator

evaluation of program quality.

2.2 RECOMMENDATIONS FOR OREGON'S EDUCATION SYSTEMS

Oregon's public and private schools can and must work together to achieve strategic education and work force goals. The most important feature of the strategic plan is *coordination and management of Oregon's diverse and decentralized education resources to achieve statewide economic goals*. As envisioned in this plan, the Office of Educational Policy and Planning, the only State agency to deal with education issues across and among systems, will play a critical role in carrying out Oregon's strategic plan. Other education agencies will contribute to the plan's success through specific responses to the needs of the groups they serve and through their integration with other education systems.

The following recommendations and action items are not intended to define a strategic plan for education. Modern basic skills, work force training, and career preparation issues are fundamental to Oregon's economic health, and are increasingly important to the future of our state, but they must be reconciled with other issues before education institutions. Instead, the following sections are intended to suggest the scope and direction of education agency policy and program responses to the economic, technological, and demographic challenges facing Oregon's economy.

2.3 THE OFFICE OF EDUCATIONAL POLICY AND PLANNING

Background

Management of public education in Oregon is diffused. Each system has independent management authority. The Office of Educational Policy and Planning was created by the 1987 Legislature and charged to develop policy and plans from a *statewide and systemwide* perspective to meet Oregon's broad education needs. OEPP's policy responsibilities include development of a comprehensive data system to serve education policy formation statewide. It is also charged with establishing education policy directly. It is expected to identify needs, develop and propose policy and program objectives to address those needs, design systems to meet those objectives, and determine the extent to which such policies, objectives, and systems are effective. Finally, OEPP is charged with reviewing post-secondary education programs and locations, resolving inconsistencies and duplications among them, and approving or disapproving proposed public post-secondary programs.

OEPP is also charged with developing a comprehensive plan for education. Its planning responsibilities go far beyond the scope of separate education systems to include all programs from kindergarten to post-graduate studies, as well as relationships among the systems. Specifically, it must plan for both the short and long term, and in developing the plan must consider: 1) continuity among education systems, 2) the desirability and scope of cooperation or consolidation of post-secondary institutions or education districts, 3) roles and relationships among all statewide agencies which provide education services, 4) the range of programs offered at each system level, 5) the impact of budget priorities among education systems and agencies, 6) student access and admission to post-secondary education, and 7) the effects of tuition and financial aid policies.

Economic Development Role

OEPP can and should play a prominent role in Oregon's strategic economic development efforts. Oregon lacks any other system, structures, or processes through which it can respond in a coordinated way to the combined economic, technological, and demographic challenges to education.

OEPP's potential role in economic development is apparent in its statutory duties. OEPP is charged to develop a consistency among education systems, to include in its planning all statewide offices which provide education services, and to evaluate the effectiveness of both education programs and its own planning efforts.

Recommendations

As OEPP carries out its responsibilities, it will become a significant force in Oregon's development. From the standpoint of economic development, however, OEPP will emphasize several measures particularly. First, in keeping with its comprehensive planning role, OEPP will work to raise public appreciation of the importance of key elements of education, including early childhood development and preparation for education, the strong link between education and future individual economic opportunity, the variety of profitable nontraditional education paths available (for example, GEDs, 2 + 2 programs, vocational/technical opportunities generally, and apprenticeships), and retraining and lifelong learning (including increased access of low skilled adults to education).

Second, OEPP will develop and periodically conduct sample survey tests of the work place preparedness of the general population. This evaluation will serve several important purposes. It will provide a measure of overall system success in educating workers and inform future program planning decisions. In addition, it will provide a statewide, popular focus on Oregon's work force and stimulate policy discussion regarding, among other issues, the effectiveness of programs in various education systems, the direction of education, skills needed in the work place, and the role of agencies providing services to the work force outside K-16 programs.

This evaluation of work force preparedness should be developed for use with other education measures that are now in use or called for in other education reforms.

Third, OEPP planning should include establishment of ongoing intersystem relationships. Important relationships currently exist, but they are largely ad hoc or periodic, and therefore not fully conducive to strategic planning. Education systems and their constituent institutions should plan jointly to coordinate program offerings and otherwise provide a comprehensive education resource capable of accommodating diverse student education needs. In particular, OEPP should work to further program coordination between public and private post-secondary institutions in the Portland metropolitan area with respect to science and technology curriculum.

Fourth, OEPP should coordinate planning for the support that social service agencies and other public and private institutions can provide to students in conjunction with education institutions. In addition, it should help expand popular appreciation of the importance of that support.

Demographic change, technological transformation, worker dislocation, and other economic challenges impose increasing demands on education institutions, but require action well outside those institutions. OEPP planning and proposals should include examination of those environmental factors which critically affect student performance and opportunities for success. Obvious issues are those addressed in Children's Agenda initiatives. In addition, in recognition of the growing importance of continuing education and worker retraining at all skill levels, OEPP should work to coordinate more fully programs offered by community colleges, public and private four-year institutions, and social service agencies.

Action Items

- OEPP will identify or (if necessary) establish intersystem working groups to address inconsistencies among education system levels. The efforts should concentrate on:
 - Conflicts between curriculum or graduation standards at one system level and prerequisite or entrance requirements at the succeeding level
 - Cooperative measures which increase student access or reduce the risk of student disenfranchisement.
- OEPP should work with all education and training agencies which can contribute to increasing work force quality to identify:
 - Environmental factors which affect student/trainee performance and

retention

- The ability of education institutions to respond to those factors and the availability of social service agency programs and other resources to meet those needs.
- OEPP will summarize current responses and propose administrative, legislative, or other actions.
- OEPP should sponsor development of a forum in which representatives of the State System of Higher Education, the Office of Community College Services, and constituent institutions can evaluate the state of continuing education in Oregon and develop a coordinated response based on its findings. This forum should include discussion and responsive recommendations based on the following: 1) the current level of service those agencies and institutions provide, 2) the current allocation of public resources for continuing education in Oregon, 3) distortions in program planning caused by legislation, administrative rules, agency organization, or funding/reimbursement systems, 4) the scope of private and in-house training programs, 5) future demand for continuing education and potential roles of public institutions in meeting that demand.

2.4 PRIMARY AND SECONDARY EDUCATION

Background

The majority of Oregon's primary and secondary education is provided in 303 school districts and is governed jointly by the State Board of Education and locally elected school boards. For 1987-88 total statewide enrollment was estimated to be 455,900. In 1984-85 local property taxes provided 66 percent of all education revenue at this level, and the State provided 27.8 percent of revenue receipts. Oregon ranks third (behind New Hampshire and Nebraska) in percentage of education revenue receipts generated at the local level. This dependence on local tax revenues results in significant variations in tax rates and resources among school districts, and it raises fundamental questions regarding equity and access to education.

The State Department of Education establishes standards for school certification. However, current levels of funding limit on-site inspections to only once every 12 years.

There is no uniform, statewide assessment of the skill levels of each student. Each school district uses skill assessment tests of its own choosing. There are currently

nine different tests used in the 303 districts. In a comparison based on a composite of these tests, Oregon ranked above average among 25 states which provide results from nationally normed tests.

In 1988 Oregon seniors achieved the second highest average SAT score among states in which at least 40 percent of all graduating seniors take the test (New Hampshire was first), and far exceeded the national average (923 vs. 904.) This performance may merely reflect Oregon's ethnic mix, however. Within specific ethnic groups students scored from well above to well below their national counterparts. Oregon's whites scored no better than the national pool of whites. Oregon's pool of SAT students includes many more whites than does the national pool (89 vs. 77 percent), however, and on average whites scored much higher than combined ethnic groups.

Oregon's high school graduation rate was 74.1 percent in 1986, which ranked 25th highest in the nation. What becomes of those who leave school early is unknown. In addition, definitions of graduation and dropout rates are not consistent among states, which further reduces the reliability of this ranking. Nevertheless, the contrast with overall SAT results raises questions regarding the goals and priorities of Oregon high schools and their ability to educate low achieving students. As the demographic profile of Oregon's children continues to change, these questions will become more important, and will require broad-based responses touching on early childhood development, the mission of schools, academic program content and method, the role of social support services, school-to-work transition, and preparation for lifelong learning and citizenship.

Challenges to Primary and Secondary Education

The challenges to primary and secondary education are great. Forces of economic and demographic change affect this segment most profoundly, since it is here that the diverse education needs of all Oregonians converge. As technological change and increasing global competition exert pressure on the Oregon economy, we must better prepare students for a more demanding work place in which relatively high paying, low skilled job opportunities are declining, and in which retraining requirements make lifelong learning and lifelong learning skills a prerequisite to future opportunities. As the "baby bust" generation ages and skilled workers become more scarce, building a world class work force will become more difficult. We must improve our capacity and ability to retain, educate, and train those who otherwise would be limited to low skilled positions. This task is made more difficult by the most serious challenge to the quality of the future work force: growth in the number and variety of children at risk of academic failure. We must find ways to raise their chances of success and better support their efforts to become educated.

Institutional Impediments

Our system of governance and funding makes it difficult to meet these challenges. Any substantial economic development strategy for education must recognize the significant level of local control and local interest implied in the high level of local funding. School financing issues, including equity and access issues, were studied extensively and addressed in the recent Governor's School Funding Reform Commission report.

Economic Development Role

Primary and secondary education have always been critical to economic development. At this level children learn fundamental academic subjects, develop skills essential to their future education, training, and employment, and begin formal socialization outside the family. From high school, students take many different paths to employment, the military, and the full spectrum of post-secondary course work from short-term applied training programs to extended academic study. For many, high school is the end of formal education. For all these groups, primary and secondary education must impart fundamental skills of greater sophistication and scope as employers respond to economic change.

In addition, too many students fail either to graduate or to earn a diploma equivalent. As skilled labor shortages increase, the ability of Oregon's schools to retain and effectively educate these students will become increasingly important.

Finally, the importance of these skills to Oregon's economic development can alternatively be stated as the importance of skills to individual well being. Individual income levels are strongly correlated with level of educational attainment. On the national level high school graduates with no college or university education earn over one and a half times as much as dropouts. This gap has grown wider in the past 16 years, and it will continue to increase with economic change.

Recommendations

The following recommendations are designed to produce students better prepared for either work or further education and training, to respond to work force trends outlined in section 2.1 above, and to make the primary and secondary education systems more responsive to future change.

We recommend a greater emphasis on statewide management of education resources to increase overall system effectiveness and responsiveness. Management should include analysis of education resources, development of a variety of educational indicators (building on Department of Education standardization evaluations), measurement of student, school, and statewide performance. Such data should be used with other education sector data and economics trends data to diagnose needs in future education program and policy planning. Measures

should be developed to assess work force preparedness and education system productivity. Department of Education performance and recognition incentives should be expanded in concert with these measures. Performance measurement should include instruments which permit comparison with other states and countries.

At the classroom level, the contribution of education to skills development and training should be thoroughly examined within the broader discussion of goals of education. Education agencies should specifically consider the relationship between content and processes of education on one hand and changing work place and work force skill requirements on the other. Learning processes and support services should be made more responsive to both community and individual student needs, and to general economic change and advances in teaching and education administration.

We also recommend changes in classroom processes to emphasize skill development to meet increasing work place requirements. Teaching practices should promote development of each student's group problem solving and complex reasoning skills. Instruction methods should rely more on development of individual analysis, self-teaching, and initiative, and less on memorization, repetition, and recitation.

Finally, the role of employers should be expanded in each of the areas mentioned above. Businesses should be included in school performance evaluation, for example, in determination of work place skills to be tested and through assessments of recent graduates' work performance. Employers can provide instructors or co-instructors who can draw connections between lessons and applications and serve as continuing, firsthand role models of the value of education to career development. Businesses can work more with education institutions to promote vocational education and apprenticeship programs. Employers can serve on education planning boards to suggest administrative improvements based on private sector management practices. Employers can also provide and sponsor summer work experiences for teachers and students. Teacher work experiences will help bring a greater real world feel to classroom instruction. Summer work will demystify work for many students, will highlight the need to develop specific work place skills, and will help to develop them. Many of these employer-education links are inspired by exemplary local programs. The Department of Education should support these programs and use them to help develop similar programs in other districts.

Action Items

- The Department of Education should develop programs which support and reward dramatic improvements in school and district level administration, including but not limited to programs that:

- Enable teachers to meet child development goals through class-specific lesson planning
- Provide a larger array of education programs to better fit students' differing learning styles (such as more generally accessible alternative education programs, 2 + 2 programs expanded to more high schools and community colleges statewide and to nonvocational programs, and a greater number and variety of apprenticeship programs).
- The Department of Education should establish a clearinghouse of information regarding successful programs and administrative practices in Oregon and elsewhere in nation.
- The Department of Education should emphasize instruction in subjects closely associated with economic change and fundamental to an accomplished work force. Specifically, math and science programs should include applications which introduce technical and engineering subjects as well as basic theory. Emphasis should also be placed on foreign language initiatives and the study of foreign cultures and geography beginning in the early grades.
- The Department of Education should expand its career education efforts to make students better informed consumers of education. Department and school district programs could include:
 - Emphasis on the changing economy and the increasing importance of education (including vocational-technical) to life opportunities
 - Accurate, comprehensive information on regional, statewide, national, and international career opportunities and their education/training prerequisites,
 - A recognition that the relationship of education to work does not end with a degree or diploma, but continues for life.
 - Information about the variety of education opportunities and the lifelong option to re-enter the education system.
- The Department of Education should develop a program to promote business partnerships with education. The program should be based on current exemplary local partnerships and specific practices noted above, and could include:
 - Programs which enable teachers to work in business from time to time

as a way of maintaining their skills, and that invite their peers in business to share their expertise with students,

- New ways for employers to present to students as concretely as possible the various careers available and the skills they require
- Productive work experiences for students and clear methods of evaluating and improving student and program performance.

2.5 COMMUNITY COLLEGES

Background

Oregon's 13 community colleges and three community college service districts provide open access education to Oregonians where they live and work throughout the state. In 1987-88 the system head count was 274,506. The full time equivalent (FTE) student body was 51,299 (approximately equal to the FTE of the state's public four-year institutions).

Community college efforts to meet local education needs include providing support services which complement and add value to student learning experiences. including career planning, financial aid, counseling, and health services. Community colleges also provide resources which directly aid small business development. Specific programs aid small business formation and management, and development of small businesses' capacity to participate directly in international trade.

The community college student body is as diverse as its mission. It includes high school students and recent high school graduates, employees in training programs customized for specific company needs, mid-career professionals, displaced workers, homemakers, welfare recipients, and correctional institution inmates.

Because community colleges increasingly rely on local property tax revenue, they must concentrate on meeting local needs. Between 1977-78 and 1987-88 local property tax revenue grew from 30.9 percent to 48.2 percent of all community college revenues, while the State revenue share dropped from 40.9 percent to 30.6 percent. In order to maintain their local support, community colleges must identify and respond to local needs. Community college planning is opportunistic as institutions' programs and curricula are designed to serve local businesses and the local work force.

Economic Development Role

Oregon's community college system is a significant resource for economic development, and is a critical part of Oregon's education infrastructure. We

recognize that in future planning we have the great opportunity to develop this resource further.

Community colleges actively analyze local trends and employment needs and develop responsive education and training programs across a broad spectrum. This includes adult basic skills education and vocational education, associate degree and college transfer programs, and skills upgrading and displaced worker retraining programs. In addition, community colleges are the primary source of specialized technical training for many skilled occupations in the state.

The demands placed on community colleges for specialized training, for individual and business support services, and for other programs have blossomed in the past decade as many groups at the local and state levels have recognized their potential as a service delivery system. Community colleges are a geographically dispersed, well recognized education system, are responsive to local trends and needs, and are capable of administering programs ranging from basic adult literacy to advance technical continuing education (for example, four-year institution programs are taught at Portland Community College's Rock Creek campus through the Lintner Center).

The role of community colleges in state economic development policy and planning is currently limited by their concentration on local issues. As demands on community colleges have grown, the institutions have become increasingly reliant on local funding, which itself has become more difficult to come by. Community college advisory councils are staffed mainly by local employers and industry representatives. Many community college students are local residents who attend only part time.

One consequence is that the community college system is highly decentralized. Coordination among institutions and between the system and other education segments is spotty. As a result, the current system cannot coordinate programs or manage resources to serve the growing range of regional needs most effectively and efficiently. As institutions attempt to respond to their communities' needs, there is great potential for either duplication of programs offered by nearby community colleges or failure to offer some programs because they are uneconomic for single colleges to fund. This problem is especially important given rapidly changing technology, which can make providing up-to-date equipment and instruction prohibitively expensive. Problems of duplication, and opportunities for greater efficiency through shared program administration, extend to high school vocational education and four-year institution technical programs as well.

Conversely, some populations are not adequately served by community colleges, either because they lie outside a community college district or because the local

community college is too small to provide the variety of training programs demanded in the local economy. When attempting to transfer credits to four-year institutions, community college students also face potential problems in the form of conflicting, inconsistent, or different academic calendars, course descriptions, and course prerequisites.

Recommendations

Oregon's community colleges are already responsive to a great range and number of student and employer community needs, from adult basic education to higher education academic preparation and advanced technical training and retraining. As skill requirements of both new and existing jobs in Oregon increase, community colleges will become more important providers of preparatory and specialized education and training.

There are several ways community colleges throughout Oregon can respond to local needs, and at the same time increase their ability to respond as a system to broader statewide needs for their services. First, education and economic development agencies should expand their efforts to increase employer knowledge of and access to community college education and training services. Second, the State should examine ways to use this resource to achieve statewide economic development goals. Third, the individual community colleges should be encouraged to work together to inventory community and statewide demand for community college services and the capacities of community colleges to meet those needs. Community colleges should also be provided with incentives to incorporate statewide goals consistent with community college goals in their planning.

Action Items

- The Office of Community College Services, the Department of Education, and industry groups should work together to identify and respond to significant education-to-work transition problems. This examination would include promotion of vocational education programs in secondary schools through:
 - Further development of curriculum which resolves conflicts between academic and vocational program degree requirements
 - more intensive industry promotion of vocational career paths
 - expansion of 2 + 2 programs to more community colleges training areas.
- OEPP and the Economic Development Department will work with the Office of Community College Services, individual community colleges, and industry advisory groups to identify targeted training opportunities (for example,

plastics industry demand for specially trained technicians) and promote community colleges as training resources for industry.

- The Office of Community College Services (OCCS) will work with the Job Training Partnership Administration (JTPA) to provide community based work force training. OCCS and JTPA will develop complementary, coordinated program offerings.
- The Office of Community College Services and the Oregon Department of Education should support and provide incentives to individual institutions to develop 1) system level planning procedures for evaluating the effectiveness of community college services delivery and 2) cooperative programs, when such programs can better serve regional or statewide community college services needs.
- OCCS will work to enhance the effectiveness of Small Business Development Centers (see Part III, Section 2 for details).

2.6 THE STATE SYSTEM OF HIGHER EDUCATION

Background

The Oregon State System of Higher Education (State System) consists of eight colleges and universities, and has a three- part mission which includes teaching, research, and public service. Portland State University, Oregon Health Sciences University, Oregon State University, University of Oregon, and Oregon Institute of Technology each have well defined academic missions, including fields of academic specialization; and they serve students from across the state. Eastern, Western, and Southern Oregon State colleges serve primarily regional student markets. Their academic missions include areas of specialization based on distinctive regional needs (for example, the SOSC performing arts program) or historic role (for example, WOSC was formerly a state teachers college.)

This mission is broadly drawn, and serves many different functions. At the core of State System baccalaureate education are liberal arts programs designed to prepare graduates for life as individuals, workers, and citizens. These are complemented by undergraduate and graduate programs which prepare students for professional and business careers. Research at State System institutions is intended to serve many purposes, ranging from applied research for regional organizations to basic research across a broad spectrum of disciplines. The institutions in the system provide a diverse array of public service programs.

State System colleges and universities have developed cooperative programs, and the State System strategic plan calls for increased cooperation and coordination with other education segments. The institutions remain largely independent, however, and pursue missions based primarily on their own rather than statewide goals. As a result, Oregon's higher education resources are currently spread thinly among State System institutions. Some proposed development programs would further this dilution. Duplication of programs within the State System and of community college offerings reduces the availability of resources. These resources could be concentrated more effectively in specific centers of excellence.

Economic Development Role

Each part of the State System mission significantly affects economic development. Higher education is fundamental to Oregonians' opportunities to achieve individual career goals, and greatly enhances their earning power. The research priorities of State System institutions are naturally tied to our resource base and economy. Research serves economic development goals directly, for example, through analysis of regional economic performance and resource and technology enhancement. Indirectly, State System institutions serve economic development through contributions to our cultural and environmental quality of life.

Recommendations

As Oregon's economy grows more knowledge dependent, the role of higher education will become increasingly important. The primary agenda item for the State System should be to define missions for each of its institutions which 1) help achieve statewide economic development goals and 2) make more efficient use of limited state resources. The following recommendations will also serve to further the State System mission generally by providing a process to evaluate institutional performance. In administration of both existing and recommended programs, the State System should strive for more effective and efficient management of Oregon's higher education resources. State System planning and resource allocation should be founded on the premise that quality of higher education instruction is critical to economic development.

In fulfilling its mission, the State System should pay particular attention to several of Oregon's key economic development needs:

First, the State System should develop curriculum and graduation requirements which reflect anticipated work force skill needs. Curriculum standards will resemble a modified version of traditional liberal education. The standards should be designed to produce intellectually adaptable graduates in response to increasing employer demand for workers who can call on a broad range of analytic skills and can easily be retrained. The trends identified in Section 2.1 above suggest several specific curriculum guidelines. For example, the State System and individual

institutions should strengthen math, science, and technology programs. Many of the committees which contributed to this plan concur with the Governor's Science Council that science and technology education are fundamental to worker training. This training not only broadens the variety of skills graduates take from college, but also prepares them for an increasingly technical work place. In addition, the State System should include significant foreign language and international studies components. Just as the work place is becoming more technologically complex, the economies of Oregon and the United States are becoming more integrated with the world economy. More students will need to better understand foreign companies and governments and how to work with them.

Second, the State System should reform continuing education. The increasing pace of economic and technological change, and the increasing complexity of work place requirements, will call for more capability in personnel retraining. Many professions such as law, medicine, and accounting already require periodic skills upgrading through continuing education courses. The State System should encourage its institutions to develop continuing education programs which better meet employer needs. Employers, for example, have identified the need for graduate level business, engineering, and computer science courses.

Each State System institution currently has a separate continuing education program, which it administers on a self-supporting basis. Total annual enrollment statewide is about 50,000 students, up to three-fourths of whom are teachers upgrading their skills to meet certification requirements. Other students are mainly employees of large firms who sponsor computer skills upgrading classes. To promote continuing education programs, the State System should examine current funding and accounting rules and support revisions which remove disincentives to provide programs generally and to serve the needs of small businesses in particular.

Third, the State System should, through the management process outlined below, develop applied research capacity which supports further growth of targeted industries. Research goals should include expanding markets for Oregon goods through new product development, and should specifically focus on high value-added products and processes. In addition, applied research capacity will provide significant indirect benefits which will help make affected industries more robust and attract out-of-state firms. Applied research will provide academic opportunities for professionals and consulting opportunities for academics. It will also complement worker training efforts.

Fourth, the State System should work with employers to develop substantial, ongoing relations at several program levels. This recommendation encompasses the preceding recommendations, and is meant to underline the importance of improved employer-education relations in this period of economic transformation to a

knowledge-based economy. Joint employer-institution development of these programs will not only serve employer and student needs, but also will further the institutions' missions by making their teaching, research, and public service efforts more effective. Employers have identified several specific training and research needs, including a plastics technology training program and wood design curriculum and research programs. In recognition of the forces transforming Oregon's economy, employers and institutions should work closely together on a continuing basis.

Fifth, the State System should assume a strong leadership role, working with institutions to make the difficult program and resource allocation decisions. It should intensify efforts to establish single centers of excellence rather than multiple centers of lesser quality. In this process the State System and institutions should examine the merits of individual programs.

In defining institutional missions, the State System should make it a priority to resolve the role of Portland State University (PSU) in the State System and in the Portland metropolitan area. Portland is becoming increasingly important as both a population and economic center, and several questions regarding program delivery are becoming critical. A number of groups in the region are working to raise PSU to the status of the University of Oregon and Oregon State University. This promotion has been suggested off and on for at least 20 years, and the State System should act decisively to resolve it. In addition to settling PSU's status, the State System should assess higher education needs in the Portland region, including demand for technology and engineering programs. In assessing these needs, the State System should ask employers, the community, and public and private education institutions to help determine the capacity needed to meet projected needs.

Action Items

- The Board of Higher Education and the Chancellor of the State System of Higher Education should be encouraged to meet with the presidents of all system institutions to:
 - Define the system and individual institutional missions, and specific performance goals consistent with those missions, based on projected resource availability, projected student population characteristics, and projected student curriculum needs
 - Develop an array of educational indicators which document student achievement and achievement of goals consistent with institutional missions.

- The Governor's Office should initiate a study of public and private post-secondary education in the Portland metropolitan area. It should examine and report on: 1) the scope of education programs offered there, 2) the demand and future needs for specific programs, 3) current and potential sources of funding for area programs, 4) degree of satisfaction with education opportunities there as judged by members of the community, area business leaders, businesses outside the area, and members of the education community, and 5) current efforts to coordinate advanced technology and science resources in the area.
- The State System and individual institutions should be encouraged to work with state and local business development interests to expand the scope of current business-education partnerships in directions consistent with the State System mission.
- (Specific research application actions are listed in Part III below).