

Approved: _____

2/1/93

Date

MINUTES OF THE SENATE COMMITTEE ON EDUCATION

The meeting was called to order by Chairperson Dave Kerr at 1:30 p.m. on January 28, 1993 in Room 123-S of the Capitol.

All members were present.

Committee staff present: Ben Barrett, Legislative Research Department
Avis Swartzman, Revisor of Statutes
LaVonne Mumert, Committee Secretary

Conferees appearing before the committee:
F. Tim Witsman, Wichita Area Chamber of Commerce

Others attending: See attached list

Senator Hensley made a motion to approve the minutes of the January 25 and 26, 1993 meetings. Senator Tiahrt seconded the motion, and the motion carried.

Chairman Kerr said that a letter has been received from Dr. Larry Vaughn, Superintendent, Wichita Public School, regarding outcomes based education in Texas (Attachment 1). He also noted that the Committee has been provided with a newspaper article on a small manufacturing plant in Arkansas (Attachment 2).

Tim Witsman discussed the report of the Kansas Commission on Education Restructuring and Accountability (attached to January 21 minutes). He advised that he, and several other members of the Commission, do not disagree with the report but would prefer the recommendations be strengthened (Attachment 3). Dr. Witsman addressed several components of Quality Performance Accreditation (QPA). He said that he supports the inclusion of concepts such as citizenship, honesty, respect, tolerance and civility in education. He added that the inclusion of "values" beyond that level takes the focus away from education improvement. He stated that the state's role should be to define the standards and then allow greater local control over how education is delivered. Dr. Witsman advised that Dr. Hornbeck made a recommendation to the commission that all state education mandates be reviewed and that those which are not absolutely vital be eliminated instead of letting individual schools apply for individual exemptions. Dr. Witsman said that the development of standards goes beyond what QPA has done and that most of the QPA statements are vague and relate the "how to" rather than required results.

Dr. Witsman referred to the issue of accountability and said there is a "muddle" about who is accountable and for what. He pointed out that there has been significant private sector support in those areas which have achieved in the area of school reform. He suggested that it would be helpful to study successful models, such as the effort in Fort Worth. Dr. Witsman said that QPA should focus more on the core areas and move away from areas which provoke a great deal of controversy.

Responding to questions, Dr. Witsman said he is skeptical about testing for "attitudes" and feels that behavior is more accurately measured. He agreed that the math standards are a move in the right direction but has concern about questions where "any answer works". He observed that, on the whole, the top third tier of students have done fairly well but the middle third and the bottom third groups need greater emphasis. Dr. Witsman said he would like to see basic education for everyone until about age 16, at which time students would either concentrate on college preparation or a vocational apprenticeship type of program for two years. He stressed that he is supportive of fine arts, culture, healthy habits, etc. education but feels that the focus must be on core education. He agreed to provide the Committee with comments on each of the 10 QPA outcomes. Dr. Witsman sees the major costs related to QPA being for teacher training.

The meeting was adjourned at 2:25 p.m. The next meeting of the Committee is scheduled for Monday, February 1, 1993.

CONTINUATION SHEET

MINUTES OF THE SENATE COMMITTEE ON EDUCATION, Room 123-S Statehouse, at 1:30 p.m.
on January 28, 1993.

Note: A letter from Mr. Witsman was later received and is attached to the minutes of February 4, 1993.

SENATE EDUCATION COMMITTEETIME: 1:30 PLACE: 123-S DATE: 1/28/93GUEST LIST

<u>NAME</u>	<u>ADDRESS</u>	<u>ORGANIZATION</u>
Rachelle Ok	Topeka	AP
Bernie Koch	Wichita	Wichita Chamber
George Tignor	Parsons	USD 503
Paul Adams	Osage City	KSBE
Mark Tallman	Topeka	KASB
James Orr	Lawrence	Univ. of KS
Joseph Fisher	Lawrence	Univ. of KS
Artie Grogg	Lawrence	KU
George Whitt	Lawrence	Intern
Orville Norder	Emporia	Intern
Chuck Tilman	Topeka	KNEA
Judy Curral	Independence	
Harshel Bass	Wellsville	
Gene P. Ewert	Wichita	
Lia M. Ewert	Wichita	
Bruce Goeden	Topeka	Kansas NEA
Brent Doane	Topeka/Wichita	CCG
BEN FRANKLIN	PHILADELPHIA	2nd CONTINENTAL
Jeff Wagaman	Topeka	Senate Staff
Robert Alcholt	WICHITA	Wichita Public Schools



Copy for Committee

Office of the Superintendent

January 22, 1993

Senator Dave Kerr, Chair
Senate Education Committee
State Capitol, Room 120-S
Topeka KS 66612

Dear Senator Kerr:

During our visit in your office last Thursday, we discussed testimony, received by your committee, related to the failure of outcome-based education (OBE) in Texas. Following is my response which reflects knowledge and experience from my seventeen years in Texas school administration, the last fifteen as superintendent in multiple districts.

Those who cite failed OBE in Texas as a basis for criticizing the Kansas Quality Performance Accreditation (QPA) process are misinformed. For the past eight years I have been among the Texas pioneers who have become knowledgeable and who have reached varying degrees of OBE implementation. I can name most of the school districts and superintendents who have made a substantial commitment to OBE. As with all change, each has experienced some internal and external criticism for a variety of reasons. However, I do not know of a district that has totally abandoned the concept. The individuals and organizations dedicated to the mission of teaching for learning for all children remain true to the philosophy and continually review instructional processes and improve strategies to better serve the children. Implementation is not the same for all districts. Each must address its own uniqueness.

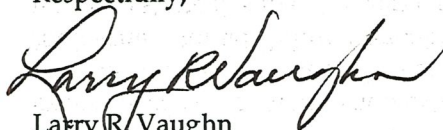
It is unfair to use Texas as an example of a failed OBE attempt for two reasons. First, Texas does not currently have a statewide system based on measurable outcomes. It does have a listing of essential elements by grade or course, but not exit outcomes. Second, an assessment program at the state level has never been established to determine success or failure.

Texas is in the process of developing a performance-based accreditation process with established standards. The desired outcomes are non-negotiable; the process is totally negotiable. Texas districts that meet the standards are automatically accredited. Districts that do not meet the standards or show substantial progress are given assistance.

It is important to remember that performance-based education is not a program, but a process to continually improve education to ensure that all students have the knowledge and skills needed for their next level of endeavor. We have a responsibility to lead both the internal and external critics. Additional staff development is essential so all educators are better trained to perform their roles.

I was delighted with the committee discussion on the public education reform proposal. I commend you for the committee's vision and the quality of the dialogue. It is a pleasure to offer my assistance to you as we continue our pursuit of excellence in education.

Respectfully,


Larry R. Vaughn
Superintendent

*Sen. Education
Attachment 1
1/28/93*

Future Factories

Small, Flexible Plants May Play Crucial Role In U.S. Manufacturing

Carrier Facility in Arkansas Picks Workers Carefully, Gives Them Autonomy

Ordering Their Own Supplies

By ERLE NORTON

Staff Reporter of THE WALL STREET JOURNAL

ARKADELPHIA, Ark. — On a pothole-filled road across from a big chicken processor in this remote town sits a Carrier Corp. plant that could be a blueprint for the future of U.S. manufacturing.

The plant looks more like an insurance office than a factory, with its sleek, one-story structure, pervasive automation and lean work force of only 150. On the factory floor, you could hear a whisper. And it's spotless — "probably cleaner than most of our houses," says Fred Cobb, a worker.

But just as Henry Ford changed the U.S. economy with mass production nearly a century ago, this plant and scores of small ones like it, many of them in isolated towns, are keeping U.S. manufacturing healthy. The Carrier plant, which produces compressors for air conditioners, operates in some unusual ways. For example, it maintains no finished-goods inventory because it makes the compressors only to order. "This is rethinking the manufacturing process," says David Garvin, a Harvard Business School professor.

Worker Autonomy

What most distinguishes this plant, however, are its workers, a breed apart from yesterday's lunch-pail crowd. Hopeful job applicants must complete a grueling six-week course before being even considered for employment — a selection process that results in a job for only one of every 16 applicants and yields a top-quality work force. Once on the job, the workers have unusual authority. They can, for example, shut down production if they spot a problem, and, within limits, they can order their own supplies.

Workers, who are nonunion and earn \$16,000 to \$17,000 a year excluding fringe benefits, don't have to punch a time clock or prove illness. Shown a doctor's excuse for an absence, Tracy Bartels, a supervisor, said, "I don't need that." The surprised employee blurted out, "Really?"

Even a lot of such plants can't make up for the heavy-industry jobs being wiped out by corporate giants such as General Motors Corp., which is closing 22 large plants. The U.S. lost a million manufacturing jobs from 1989 to 1991, and the Bureau of Labor Statistics expects no net additions before the end of the century to the current total of about 18 million.

Many New Plants

Yet U.S. manufacturers aren't ceding everything to foreign competitors. Instead, they're quietly opening small plants that require small, educated work forces.

Eaton Corp., a Cleveland-based auto-parts maker, started up a 120-employee plant in Hamilton, Ind., in September. Intel Corp. is constructing a computer-chip factory in Santa Clara, Calif., eventually creating 250 jobs. Miles Inc. has announced plans to build a \$140 million facility in Berkeley County, S.C., where 150 people will make synthetic fibers. M.A. Hanna Co., of Cleveland, is building a 60-employee plant to make color concentrates for plastics in Phoenix, near a big customer. And Stafford Railsteel Corp., of Charlotte, N.C., plans a mill that will be the first new U.S. facility for making rail steel since early this century.

By their very nature, small plants are responsive, able to shift from one product to another or change production schedules quickly. They require less movement of materials. Managing them is easier because they have few layers of employees, and worker ideas can rise to the top faster. And they get better workers because their size enables them to be more selective.

Rural Locations

Such plants tend to locate in rural areas, which, being small, didn't land the giant factories of yesterday. "They can get better-educated, better-motivated workers than they can in the urban communities," says Michael Cantwell, national director for manufacturing for Grant Thornton, an accounting and consulting firm. Moreover, he adds, these "tend to be the people who don't like unions."

Carrier had no choice but to build a new factory: To be competitive, the United Technologies Corp. unit had to make its own compressors. But the big plants it built in the 1970s and 1980s, with their high fixed costs and inflexible production lines, proved to be money-losers, and the company began closing them.

So Thomas L. Kassouf, president of the compressor division, envisioned a streamlined plant that, even running at capacity, would employ no more than 400 workers. Carrier drew a circle around its Texas and Tennessee plants that would use the compressors and chose Arkadelphia as a possible site. The town, which has a population of 10,014, was eager; 1,700 people lost jobs there when three plants closed in 1986 and 1987. Unemployment soared to 15% of the work force from 5%. People were leaving.

Determined to woo Carrier, county voters approved a 1% sales tax to extend a sewer line to the local industrial park. The state government promised hundreds of thousands of dollars in tax breaks and training costs. In early 1989, Carrier pledged \$100 million to the project, and the

Please Turn to Page A2, Column 4

Future Factories: Manufacturers Try Small, Flexible Plants

Continued From First Page

plant opened last Oct. 13.

It's like no other plant in Arkadelphia. Tiles that soak up sound and reflect light cover much of the ceiling. The gray floors gleam. In a dirty plant "you get a don't-give-a-damn attitude right away," says a worker, Chuck Pennington.

Women work beside men in every area and can handle every job. Carrier designed the plant so that no one has to lift anything heavier than 12 pounds repeatedly. "Why should there be any barriers in our plant?" Mr. Kassouf asks.

The plant is highly automated. In one work unit, a person places two pieces of metal in a cutting machine, shuts the glass doors and punches a button. Guided by a computer that keeps the cut from straying more than eight millionths of an inch, the machine slices steel like butter.

Carrier makes one part of the compressor — the part requiring the most complex machining — in just over a minute. As a result, the company expects to produce each compressor for \$35 less than it now pays to buy them from suppliers, for a saving that could run \$26.3 million a year when annual production hits 750,000.

Flexibility is crucial, both among workers and in the design of the plant. Carrier teaches workers several jobs, so that if one is sick, another can fill in quickly. In addition, "the whole plant could probably be reconfigured in several weeks' time," Mr. Kassouf says.

Suggestion Accepted

The first workers hired suggested that they themselves install the machines. Management agreed, and several workers jetted off to machine-tool plants — some flying for the first time — where they learned how to assemble the equipment. That experience instilled a sense of ownership; many talk about "my machine." It also saved \$1 million of installation costs.

And because of their resulting familiarity with the equipment, employees don't have to wait for maintenance workers to fix a machine that breaks down.

When workers recently realized that their machines were arranged in a cumbersome way and that compressors were skipping a welding machine only to have to double back to it later, they pulled up seven machines and realigned them. They came up with the idea one morning and began implementing it that afternoon after clearing it only with their immediate supervisor. As a result, they completed the job in just four days. In a traditionally organized plant, by contrast, the need to consult an array of managers and wait for a maintenance crew to do the work would have dragged out the project for weeks.

Even during normal operations, says Mark Wells, an assembly-line employee, workers in teams quickly learn who has which skills and take directions from the most knowledgeable.

Getting a job at this Carrier plant is a bit like applying to college. It starts with a standard state test for job applicants, who must be high-school graduates or have a general education diploma. Only those scoring in the top third advance. Their references are checked closely, with Carrier managers zeroing in on how well applicants work with other people. The applicants are interviewed by managers and even assembly-line workers — and what the workers think strongly influences who gets hired.

Prospective Bosses

Workers even sometimes interview prospective bosses. In one case, a manager at another Carrier plant recommended a young man, one of his subordinates, for an engineering spot. The workers who interviewed him told William Harrison, production and materials manager at Arkadelphia, that the chemistry just wasn't right. The man didn't get the job.

Workers get involved in the hiring process in informal ways, too. Clyde Briggs, the human-resources manager, recalls asking an employee about an applicant he had worked with before.

"I don't think you guys want to hire him," the employee said. "The question is," Briggs responded, "do you want to hire him?" The answer was no, and the applicant was rejected.

Those who advance past the interviews take a six-week course. For five nights a week for three hours — with a couple of Saturdays thrown in — applicants learn blueprint reading, math such as fractions and metric calculations, statistical process-control methods, some computer skills, and solving the problems involved in dealing with fellow workers. While taking the course, the applicants — most of whom have other jobs — still haven't been hired by Carrier, haven't any assurance that they will be — and don't get paid.

Meanwhile, the instructors watch how well applicants work with each other. The applicants even judge one another. Inevitably, a few fall by the wayside. One was a woman who refused to work with others when the instructor wasn't nearby.

But getting through the training ses-

sions virtually guarantees not only a job but a say in how the plant operates. When Gene Whitaker, a 24-year-old assembly worker, noticed the paint wasn't adhering well to the compressors, he decided the pretreatment process needed sodium ash to make the paint stick better. So he picked up a phone and placed a \$5,000 order with a supplier. "I've never been stopped" when ordering supplies, he says.

Ceilings on Purchases

When one employee told Ms. Bartels he needed new gloves, the supervisor handed him a catalog. "Isn't it somebody's job to do that?" he asked. She explains later, "They're the ones who are going to use it; they might as well decide what they're going to use." Within various departments, however, workers are held to flexible ceilings on how much they can buy without getting management approval.

The workers clearly relish exercising their newfound authority. "We have the opportunity to prove that we can do it," says a beaming Mr. Pennington, who previously worked at an LTV Corp. missile plant that was struggling to push decision-making down into the ranks: "Every day, there are 100 problems that [managers] never know existed."

The plant's compressors are not only cheaper but also of high quality. Workers check the products constantly, rather than at prescribed intervals. All the finished compressors are cranked up, and at least one from every group is pulled off the line to test noise and energy levels.

That quality is critical to Carrier's success in the air-conditioning business, since compressors account for as much as 50% of an air conditioner's production costs. And faulty compressors can quickly increase the company's warranty costs. But Carrier executives believe the plant will not only serve as a model for future plants but keep it competitive. Says Mr. Kassouf: "My goal is to sell compressors from Arkansas to Japan."

Testimony for House and Senate Education Committees
January 28, 1993

Testimony of F. Tim Witsman
The Wichita Area Chamber of Commerce

Thank you for the opportunity to appear before you on what is one of the most important issues facing our state and nation. Our county-wide economic development organization, WI/SE, has invested more resources in education and training than any other area.

Recently I had the privilege of being a member of the Commission on Education Restructuring and Accountability. Though the Commission's report is a positive step, several of us feel that it falls short of addressing fully some of the most important issues. We are, therefore, issuing a minority report. We regard it as a supplement rather than an angry rebuttal.

Our suggestions focus on standards, structure, the development of management capacity, governance, accountability and partnerships. My testimony today will cover some, but not all, of these areas.

The State Board of Education's primary vehicle for reforming the schools is Quality Performance Accreditation, QPA. I chaired the Commission's Wichita hearing and was exposed to the same criticisms you have heard regarding QPA. I do not share the view of those who regard QPA as a plot to use the schools to indoctrinate or take children away from their parents.

I am far more sympathetic to their questioning of the inclusion of particular values in the curriculum. The issue of values is terribly important and requires a very clear vision. It is more than appropriate, it is necessary to teach certain democratic values in the public schools. Concepts such as participation in civic affairs, tolerance, responsibility, and civility are vital to the functioning of a democracy. What is totally inappropriate is use of the schools to teach the viewpoints of the left, right or any other ideology. I have seen publications of respected education organizations calling for the teaching of disarmament and a particular type of social justice. I have written to say that the specific political beliefs of a staff member have no place in the curriculum of the public schools. Similarly, I am opposed to the inclusion of specific religious or social views of the right being injected into the school curriculum.

Unfortunately, there are some elements of QPA which lend themselves to the criticism of including values beyond those which are necessary for the functioning of a democracy. In so doing, QPA invites attacks on its intentions rather than focusing on the improved preparation of our children for their futures. The danger is that people will identify school reform with placing

Sen. Education
Attachment 3
1/28/93

condoms on bananas rather than improving the core competencies necessary to achieve a high standard of living. More important is what QPA does not do. While it provides some general statements, most of which are mislabelled as outcomes, it does not provide real standards. At least four of the QPA outcomes really deal with "how" rather than what. Several others are so vague as to provide little guidance. Yet others are more on the order of goal statements than outcomes.

Fundamentally there is a misunderstanding of roles here. There are a number of people around the state who are concerned with the issue of local control. The question should be, "What is the state best equipped to do and what is the local school best qualified to do?" There is no other industrialized country with which I am familiar that leaves the setting of standards to local units. It is the state of Kansas which should define the outcomes rather than asking over three hundred districts to master that task. There is no evidence from my conversations with school district superintendents that the State Board has the resources to provide over three hundred districts with the technical assistance for them to produce first-rate outcomes. Finally, why should a student moving from Maize to Valley Center within Sedgwick County face a different set of standards?

It is not necessary for the State to reinvent the standards wheel. The New Standards Project, a consortium of 18 states and six cities, is working to develop common standards and assessments in core subject areas. The National Council of Teachers of Mathematics has developed standards for math achievement at all levels of education.

But it is equally important that the state get out of the way and permit the local schools to determine how to achieve the desired results. No one in Topeka can specify how to reach the outcomes for communities as diverse as Kansas City and Wamego. In fact we believe that the Commission should have accepted Dr. Hornbeck's recommendation to undertake a review of all mandates and regulations imposed on the schools by the state. Ideally all mandates which do not serve certain narrowly defined purposes, such as the insurance of civil rights, should be eliminated in a single piece of legislation. The argument that schools may seek relief from specific mandates, rather than the state providing all schools with a blanket exemption, flies in the face of research which says that blanket relief is far more effective.

This issue of standards is key to what the employers are trying to get across to the education establishment. Recently the CEO of a major corporation had heard an education leader talking about programs focused on quality in the schools. His reaction was that in order to achieve quality you must know what you are trying to produce. Recently I spoke with a math teacher in an International Baccalaureate program. He was telling me that he knew precisely what the students needed to master during the current semester in

order to be ready for their next year because he knew what they were to have mastered in math to achieve the degree.

With a real set of standards you can utilize continuous progress, mastery learning and an aligned curriculum. Without a clear set of desired results on which to build the curriculum, approaches such as continuous progress are merely another sham by education to avoid standards and accountability.

The accountability question brings into sharp focus the muddle which is the structure and governance of education in Kansas. The responsibilities of the legislature and the State Board are unclear. The same confusion holds with community colleges and vocational schools, the state board versus local boards, and is exacerbated by federal mandates. When accountability is confused there is none and it encourages the shifting of responsibility and blame.

The Commission's report watered down the recommendations on a strong private sector support component. In many states which have launched reform efforts-South Carolina, Kentucky, and Texas to name a few-it was business leadership in the state which led the charge for large scale change including funding, when necessary. Private support to help educate the public should be an important component of a Kansas reform effort.

Lastly, the Commission report largely ignores some of the best work done on education reform. The United States Department of Labor did an excellent job of setting a framework to define what the workplace requires of schools. The Secretary's Commission on Achieving Necessary Skills produced the SCANS report. That report defines basic skills and proficiency levels needed to achieve world-class preparedness.

There are other excellent examples which we can build on, including Ft. Worth's C3 program. For 30,000 job subtasks, they have established the proficiencies needed in reading, mathematics, writing, speaking and listening, computer literacy, reasoning and problem solving, and originality and creativity. This is precisely what the schools have been asking: "What is it that our graduates need to know for the workplace?"

In summary, without faulting anyone in the education system, we must first admit the results of our K-12 education system do not measure up to those of our major international competitors. Numerous reports from America 2000 to the Business Roundtable have laid out the problem.

In Kansas we have responded using the Quality Performance Accreditation approach. To scrap it would require a complete restart of our reform efforts. But it should be refined to focus on the core areas-mathematics, science, history, reading, writing, thinking skills, and citizenship. The more QPA drifts away from

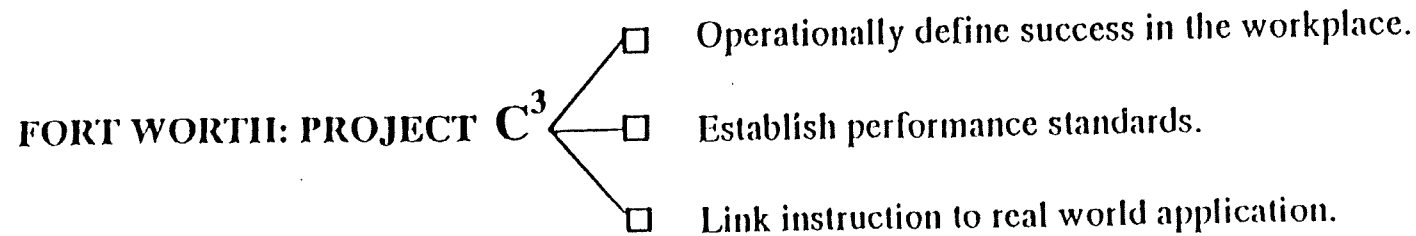
the essence of the reform movement, the less effective it is and the more opposition it creates.

We must both charge the state with defining standards for all Kansas children and end the state's interference with the implementation of instruction. What we need is state standards locally achieved.



3-5
1/28/93

THE CONCEPT



THE STANDARD

Intermediate and Adept levels of proficiencies

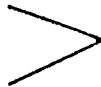
THE PROCESS

Link Instruction to Real World Application.

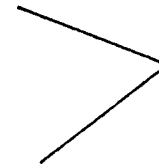
800 Job Analyses
4,000 Tasks
30,000 Sub-tasks



Merge with SCANS
competencies



Teachers and community
resources collaborate to design
and produce authentic learning
tasks for students.



1. Students do the work.
2. They usually succeed.
3. When they don't, they persist.
4. They seek more work and recommend it to others.
5. They are satisfied.
6. They achieve the intended learning results.

Project C³ Job Analysis

SAMPLE

Company/Organization FWISD

Dictionary of Occupational Titles (DOT#) 201.362-030

Job/Title

Secretary

Person(s) completing form Doris Baird, Louise Ellison
Sheila Hicks, Nancy Jarratt

Level of education
necessary for this
position

High School diploma
required; secretarial/business
courses required

Position of person(s) completing form Secretary

List four or five major tasks
commonly performed on this job

1. Use word processing to
produce reports, memos, charts
and other documents

2. Make travel arrangements

FORT
WORTH

INDEPENDENT SCHOOL DISTRICT

Please explain what kinds of things you need to do in order
to successfully perform the major task you have listed

1. Be able to read and understand software manual.
2. Have keyboarding skills and make application of software packages.
3. Have statistical typing skills.
4. Be able to decipher handwriting.
5. Have knowledge of good design/layout of materials.
6. Know correct use of good grammar, punctuation, spelling,
and sentence structure.
7. Have knowledge of departmental and FWISD procedures and
processes for producing and disseminating reports.
8. Be able to work under pressure to meet deadlines and make revisions.

1. Have knowledge of FWISD forms.
2. Have knowledge of FWISD travel policies.
3. Be able to communicate with travel agents effectively.
4. Have the ability to coordinate supervisor's needs and preferences
with airline schedules.
5. Have the ability to listen and implement instructions.

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Levels of Proficiency

Rudimentary

Basic

Intermediate

Adept

Advanced

A. Reading

ability to carry out simple, discrete reading tasks; e.g., read safety rules, simple directions, want ads, work orders, etc.

ability to understand specific or sequentially related information; e.g., obtain information from a directory, understand product labels, take written tests, read shop manuals and newspapers, etc.

ability to search for specific information, interrelated ideas, understand main theme or point, make generalizations; e.g., proofreading to delete errors, etc.

ability to find, understand, summarize and explain relatively complicated information, understand cause and effect relationships; e.g., interpret school policy, procedures and rules, interpret and learn from scientific or technical journals, etc.

ability to evaluate symbolism, multiple meanings and subtle influences in written material; e.g., interpret classic literature, political writing, etc.

B. Mathematics

ability to perform simple addition and subtraction, multiplication and division; e.g., inventory number of items in stock, weigh produce and calculate price, total a bill for services, etc.

ability to use basic math skills to solve two step problems; e.g. make cost estimates for a construction project, etc.

ability to use algebra and geometry concepts to solve practical problems; e.g., calculate the number of yards of material needed for a pattern, calculate arrival times in transportation, etc.

ability to use more advanced math, such as calculus, probability and statistics, differential equations, to solve problems of design; e.g., design an electric circuit, projecting growth patterns in a geographical area, etc.

ability to create mathematical models of a process, ability to derive new theorems or methods of solution; e.g., derive and solve partial differential equations for a refining process, etc.

C. Writing

ability to copy serial or model numbers, label materials or fill out a time card

ability to write standard English sentences; e.g., complete application for employment and record telephone messages, etc.

ability to write to inform, and express ideas accurately with correct spelling, quoting and phrasing; e.g., to construct letters and reports, write a business letter to relate actions taken at a meeting, etc.

ability to write reports, studies, documents, etc.; ability to write to convince; e.g., write a report recommending a change in policy, etc.

ability to write publishable material; e.g., journal articles, books, novels, etc.

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IDENTIFICATION OF WORKPLACE SKILLS

CONTRACT ADMINISTRATOR * WORKER 162.117-014 3

Prepare documents & Bid services

R M W S C P O

4 3 5 4 2 4 3

Develop schedule, review/revise scope of services
Know princpls/practs/procedrs of public contracting
Understand technical documents
Prepare bld/proposal documents
Know public bidding laws
Analyze/evaluate bids/proposals

Conduct negotiations and changes

4 3 4 4 2 5 3

Negotiate/obtain fair prices
Prepare/conduce/document negotiations
Determine pricing methodology
Know estimating/pricing techniques
Analyze contractor proposals/risk determine merit

Level of Proficiency

R = Reading, M = Mathematics, W = Writing,
S = Speaking/Listening, C = Computer literacy,
P = Reasoning/Problem solving, O = Originality/Creativity

**FORT
WORTH**

INDEPENDENT SCHOOL DISTRICT

PERCENTAGE OF OVERALL JOB RATINGS BY AREAS
AND LEVELS OF PROFICIENCY REQUIRED
N = 791

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1/28/93

AREAS OF PROFICIENCIES	PERCENTAGE OF JOBS RATED				
	1 RUDIMENTARY %	2 BASIC %	3 INTERMEDIATE %	4 ADEPT %	5 ADVANCED %
Reading	6	29	34	25	5
Math	15	42	30	9	2
Writing	11	32	34	19	3
Speaking and Listening	4	23	41	25	7
Computer Literacy*	24	29	29	7	2
Reasoning and Problem Solving	7	25	38	24	6
Originality and Creativity	12	44	25	15	3

*9% of the jobs analyzed indicated Computer Literacy was not applicable to the job.

FWISD,R/D April, 1991

FORT WORTH : PROJECT C³

Sampling of Workplace Skills by Levels of Proficiency

READING

Rudimentary

1

ability to carry out simple, discrete reading tasks; e.g., read safety rules, simple directions, want ads, work orders, etc.

Basic

2

ability to understand specific or sequentially related information; e.g., obtain information from a directory, understand product labels, take written tests, read shop manuals and newspapers, etc.

Intermediate

3

ability to search for specific information, interrelated ideas, understand main theme or point, make generalizations; e.g., proofreading to delete errors, etc.

Adept

4

ability to find, understand, summarize and explain relatively complicated information, understand cause and effect relationships; e.g., interpret school policy, procedures and rules, interpret and learn from scientific or

Advanced

5

ability to evaluate symbolism, multiple meanings and subtle influences in written material; e.g., interpret classic literature, political writing, etc.

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FORT WORTH PROJECT C³
IDENTIFICATION OF WORKPLACE SKILLS
BY LEVEL OF PROFICIENCY

DO NOT DUPLICATE

READING

LEVEL	SKILL	COMPANY	JOB	DOT #
RUDIMENTARY	Knowledge and use of telephone equipment/directory	1	Secretary	201.362-030
	Know rules/regulations of driving on AOA ramp	3	Passenger service AG	352.377-010
	Assist in receiving purchase items	5	Truck driver 1	620.131-014
	Read and understand safety procedures	6	Craft technician	638.281-014
	Correctly fill out contracts	11	Compliance manager	184.117-050
	Update files yearly	11	Compliance manager	184.117-050
	Maintain logs on drivers	11	Compliance manager	184.117-050
	Know how to read shipping instruction, maps, etc.	11	Truck operator	904.383-010
	Must be able to read bills of lading	11	Truck operator	904.383-010
	Must be able to proofread documentation on loads	11	Truck operator	904.383-010
	Daily, weekly, monthly summaries about first aid log	16	Data entry clerk	203.362-010
	Filing	16	Data entry clerk	203.362-010
	Know department and college policies/answer questions	26	Senior secretary	201.362-030
	Create glossaries for systems for those who are unfamiliar	34	Computer Programs	020.162-014
	Read and understand safety manuals	37	Housekeeping worker	321.127-010
	Read and follow chemical mixing instructions	37	Housekeeping worker	321.137-010
BASIC	Know location/schedule of staff	1	Secretary	201.362-030
	Ability to read meters correctly	1	Collector	241.367-010
	Know how to use Mapsco	1	Collector	241.367-010
	Be able to read a map and follow it	1	Collector	241.367-010
	Read and understand the account you are working	1	Collector	241.367-010
	Have good reading skills to understand work orders	1	Collector	241.367-010
	Knowledge of computer system and procedures	1	Customer service rep.	239.367-010
	Read meters accurately	1	Meter reader	209.567-010
	Maintain a library of vendor catalogues	3	Buyer	249.367-066

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READING

LEVEL	SKILL	COMPANY	JOB	DOT #
INTERMEDIATE	Instruction manuals available/understood	1	Secretary	201.362-030
	Correct use of grammar	1	Secretary	201.362-030
	Know proper format of correspondence	1	Secretary	201.362-030
	Know company policies and procedures	1	Secretary	201.362-030
	Prioritize office work	1	Secretary	201.362-030
	Understand data processing terms	2	Computer programmer	020.162-014
	Know computer languages	2	Computer programmer	020.162-014
	Read and understand manuals	2	Computer programmer	020.162-014
	Follow complex instructions	2	Computer programmer	020.162-014
	Compile various reports from records	2	Legal secretary II	201.362-010
	Understand policy regarding the authority to commit	3	Buyer	249.367-066
	Locate suppliers of materials/items required	3	Buyer	249.367-066
	Follow safety rules and regulations	3	Passenger service AG	352.377-010
	Good command of one or more foreign languages	3	Passenger service AG	352.377-010
	Ability to work with international documentation	3	Passenger service AG	352.377-010
	Know local/international geography and airport codes	3	Passenger service AG	352.377-010
	Knowledge of computers	4	Accounting director	160.167-010
	Produce financial and governmental reports	4	Accounting director	160.167-010
	Read diet cards/serve individuals as directed by physician	5	Food service worker	317.687-010
	Follow all policies and procedures	5	Food service worker	317.687-010
	Know cause and effect of chemicals/other substances	6	Craft technician	638.281-014
	Read/interpret blue prints and city codes	6	Craft technician	638.281-014
	Create advertisements	6	Typesetter	203.582-062
	Develop formats for special copy	6	Typesetter	203.582-062
	Input and format advertising copy	6	Typesetter	203.582-062
	Correlate curriculum guides	7	Special ed. teacher	094.227-018
	Select appropriate materials	7	Special ed. teacher	094.227-018
	Organize content for effective teaching/learning	7	Bilingual teacher	091.227-010
	Ability to interpret written guidelines	10	Clinical nurse	079.367-010
	Knowledge of medical techniques/diagnostic procedures	10	Clinical nurse	079.367-010
	Ability to organize/analyze interpret/evaluate eng. studies	10	Civil engineer	005.061-014
	Able to read/understand software manual	12	Secretary	201.362-030
	Locates new sources of supplies	14	Contract specialist	162.117-018
	Read job prints & apply construction standards	22	Senior lineman	821.261-026
	Must be able to proofread your work	24	Cashier	211.362-010
	Ability to enter correct data in medical library system	26	Sr. Library asst.	100.367-018
	Know medical terminology and abbreviations	26	Registered nurse	075.374-010

READING

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LEVEL	SKILL	COMPANY	JOB	DOT #
INTERMEDIATE (Cont'd)	Proofread documents	27	Secretary	169.167-014
	Read schematics, blueprints and technical manuals	27	Mechanic	620.261-010
ADEPT	Read and interpret any software error messages given	2	System programmer	020.187-010
	Stay abreast in new developments in technology	2	System programmer	020.187-010
	Be familiar with the case and the law being applied	2	Paralegal	119.267-026
	Know principles/practices/procedures of public contracting	3	Contract administrator	162.117-014
	Understand technical documents	3	Contract administrator	162.117-014
	Know public bidding laws	3	Contract administrator	162.117-014
	Analyze/evaluate bids/proposals	3	Contract administrator	162.117-014
	Prepare/conduct/document negotiations	3	Contract administrator	162.117-014
	Understand/explain contract terminology/requirements	3	Contract administrator	162.117-014
	Demonstrate knowledge of child's language devel./acquisi.	7	Bilingual teacher	091.227-010
	Learn the curriculum content/district goals objectives	7	Bilingual teacher	091.227-010
	Learn instructional strategies for second language	7	Bilingual teacher	091.227-010
	Knowledge of engineering	10	Civil engineer	005.061-014
	Ability to apply professional knowledge of engineering	10	Civil engineer	005.061-014
	Analyze data and reach logical conclusion	14	Realty specialist	188.117-122
	Read and interpret legal documents	14	Realty specialist	188.117-122
	Analyze construction methods/terminology	14	Realty specialist	188.117-122
	Read and interpret regulations/policies/procedures	14	Realty specialist	188.117-122
	Understand/apply laws/rules/policy	15	Police officer	375.376-010
	Understand laws and rules	15	Police officer	375.376-010
	Know of load documentation	18	Note clerk	211.362-026
	Knowledge of how to find sources of law	21	Law office asst.	201.362-010
	Possess working knowledge of anatomy and physiology	26	Registered nurse	075.374-010
	Know laws pertaining to administration and storage	26	Registered nurse	075.374-010
	Knowledge of anatomy, physiology, pharmacology, etc.	26	Registered nurse	075.374-010
	Read schematics/blue prints	27	Mechanic	620.261-010
	Interpret engineering drawings, sketches, etc.	29	Tool maker	601.280-000
	Read/understand engineering drawings, sketches, etc.	29	Tool maker	601.280-000
	Understand construction standards and tolerances	31	Superintendent	891.137-010
	Be able to read/interpret/report on info gathered	31	Central station oper.	100.387-010

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READING

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LEVEL	SKILL	COMPANY	JOB	DOT #
ADVANCED	Know how to find the law and shepardize it	2	Paralegal	119.267-026
	Know how to read a case and understand points of law	2	Paralegal	119.267-026
	Be able to read/understand a filed case report	2	Paralegal	119.267-026
	Be able to use and understand scientific techniques	2	Sr. forensic biologist	041.061-030
	Know/incorporate applicable regulatory requirements	3	Contract administrator	162.117-014
	Understanding contractual relationships/laws and principles	3	Contract administrator	162.117-014
	Knowledge of contracting standards	3	Contract administrator	162.117-014
	Know how and where to look for info. - library, etc.	6	Reporter	131.267-018
	Recognize what info. is needed to research	6	Reporter	131.267-018
	Sift through info. and decide what is fact & pertinent	6	Reporter	131.267-018

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5/24/90