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ABSTRACT

A survey of 177 employers of Wyoming vocational education graduates sought to identify skills and competencies the graduates needed. A random sample of 525 businesses both Wyoming-based and foreign (home-based outside of Wyoming) were mailed surveys; 267 survey forms were returned, but only 177 provided data for analysis. Findings indicated that the skills and abilities needed by beginning employees was very much dependent on the industry or business for which they were preparing. All respondents rated basic academic skills as important, but the data indicated that they alone were not sufficient. Employers indicated that over 57 percent of their beginning employees had a high school diploma or the equivalent. Higher order math, science, reading, and writing skills were all perceived to be of lesser importance. Average scores for higher order skills placed them at the bottom of the list. All work attitudes and job-holding abilities received an average rating of importance that was equal to or higher than any on the employee skill list, with the exception of dress and/or appearance and the ability to advance on the job. A recommendation was for vocational education programs to teach and reinforce work attitudes and habits. (YLB)

AN ANALYSIS OF EMPLOYEE SKILLS REQUIRED BY EMPLOYERS IN WYOMING

Northern Rocky Mountain Educational Research Association
Jackson, Wyoming

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Vocational education in Wyoming is delivered primarily by comprehensive high schools and regional community colleges. At the present time, secondary vocational programs across the country are under attack due in part to the failure to exhibit acceptable basic skill competency levels on the part of many high school graduates. While the blame for the problems in the nation's educational system may be misplaced, vocational education has the opportunity to assist in preparing a more qualified high school graduate - more qualified to enter Wyoming's job market and more qualified for continuing education in the community colleges and the University.

The fundamental question posed and answered by the Education and Economics Task Force (1989) was: "What do our high school graduates need to know and what skills should they have to succeed in a radically altered world economy?" As part of their answer to this question, the Task Force asserted:

> The demand of work today is for employees who are lifelong learners. National statistics indicate that the average employee will change jobs four times in a lifetime and that every job that now exists will be obsolete by the year 2000.
>
> As a consequence, employers require flexible, adaptable, thoughtful, creative workers. The era when a person with very little education could learn one repetitive act on an assembly line and make a good living is over...
>
> ...In keeping with this vision, employers no longer seek and support the kind of potpourri of elective courses or entry-level job skill courses it did a few short years ago. The private sector now seeks a more literate person capable of making vital contributions to the job and the society in which he lives...
>
> ...Is it any wonder then that Denver businessmen polled in 1989 said they thought it important that their employees possess basic skills, but that anyone limited to those skills would not be considered for promotion? Analytical thinking, communication, and computational faculties rank much higher than mundane job skills.

Many of the facts and opinions alluded to by the Task Force are accepted as serious concerns by vocational educators. The differences lie in the conclusions drawn. Some policy makers and leaders in education are associating the failure of America's educational enterprise with vocational education and assume that increased graduation requirements and the resulting reduction or elimination of vocational education programs is the solution. On the other hand, vocational educators believe that basic skills should be integrated into vocational curricula and that students should be encouraged to enroll in basic skills courses related to their vocational area.

OBJECTIVES

The major goal of this study was to provide current information regarding the level of basic job skill training of individuals employed by businesses and industries located in Wyoming. To accomplish this goal, the following objectives were undertaken:

1. Identify current and potential employers of Wyoming vocational education graduates.
2. Develop a survey instrument to aid in identifying skills and competencies needed by Wyoming's vocational education graduates.
3. Validate the results of the survey by comparison with appropriate national studies of vocational education.

PROCEDURES

Extensive research was conducted to assess previous research conducted in similar subject areas before creating the survey form. Lists of Wyoming employers and their addresses were obtained from the Secretary of State and the Wyoming State Board of Nursing. Both Wyoming based and foreign (home based outside of Wyoming) businesses were included in these lists. A random sampling was run to determine the 525 businesses which would be included in the survey's population.

The initial mailing consisted of 525 surveys, with a follow up mailing sent to those firms not responding to the initial mailing within a reasonable time. A total of 267 survey forms were returned (51%) of which 177 forms provided data for analysis. The balance of the surveys returned indicated either that the firm had no employees or that the firm was no longer in business.

FINDINGS

Table 1 indicates the number of employers by self-selected industry classification, as well as the number of full and part-time employees. The service industry represented over 65% of the responding business and over 50% of full-time employees in the sample. These numbers represent the strength of the service industry in Wyoming and nationwide. According to Workforce 2000, the service industry will continue to be the largest employer

TABLE 1

Number of Employers and Employees by Industry Classification

	Employers		Full-time Employees		Part-time Employees	
Industry Classification	No.	%	No.	%	No.	%
Services	116	65.54	823	52.45	449	62.19
Energy production	15	8.48	113	7.20	19	2.63
Manufacturing	12	6.78	222	14.15	21	2.91
Transportation	3	1.70	7	0.45	45	6.23
Health or Medical	14	7.91	378	24.09	155	21.47
Agriculture	17	9.61	26	1.66	33	4.57

According to the survey returns, 57% of beginning employees in Wyoming have a high school diploma or the equivalent, 23% have up to two years of training after high school, and 16% have a 4-year college degree or more. Fifty-nine percent of the employers indicated that an applicant's educational background usually or always affected their decision to hire that individual. Eighty-three percent of the employers responding indicated that newly hired employees were either well prepared or fairly well prepared in that their education covered most entry level job requirements.

Table 2 illustrates respondents' perceptions of the importance of skills and abilities needed by beginning workers in their firms. Employers were asked to rate the skills and abilities from not at all important (1) to very important (4). Some variations in the ratings were noticed based on the company's industry classification. Statistically significant variation (i.e., the probability of the differences occurring by chance is less than 5%) is noted by an asterisk. The table lists the skills in rank order, from the highest to lowest, arranged by the average rating of all respondents. Average ratings by industry type are also noted.

The average rating received by several of the skills was somewhat surprising, considering the national reports on the status of education in America and the need for increased academic skills

TABLE 2

Perceived Importance of Selected Skills for Beginning Employees

Employee Skill	Avg	Svc	Engy	Manuf/ Const	Trans	Health	Ag
*Oral communications	3.52	3.57	3.27	2.91	3.50	3.93	3.41
Basic reading	3.50	3.55	3.28	3.44	4.00	3.77	3.12
Knowledge of job duties	3.47	3.36	3.80	3.58	4.00	3.77	3.56
*Ability to maintain safe work practices	3.47	3.32	3.85	3.73	4.00	3.64	3.71
Ability to maintain quality control	3.40	3.41	3.36	3.80	3.50	3.38	3.08
Adaptability to new job situations	3.39	3.41	3.21	3.30	3.50	3.62	3.33
*Use of machines and equipment	3.34	3.16	3.80	3.82	4.00	3.13	3.69
Skill transferability	3.32	3.33	3.21	3.36	3.00	3.33	3.40
*Basic writing	3.18	3.33	2.64	2.91	3.00	3.54	2.47
Basic math	3.15	3.18	2.92	3.30	3.00	3.15	3.00
*Spelling	3.07	3.21	2.75	2.70	3.50	3.31	2.31
*Technical vocabulary skills	3.03	3.05	2.77	3.00	4.00	3.58	2.50
Knowledge of specific technical job information	2.89	2.74	3.07	3.13	4.00	3.36	2.97
Leadership skills	2.88	2.81	3.08	3.20	3.00	3.23	2.68
*Use of hand and power tools	2.85	2.57	3.38	2.91	3.00	2.75	3.56
*Use of computers	2.57	2.74	2.45	2.00	2.00	2.60	1.44
Advanced tech. reading	2.48	2.47	2.27	1.78	3.50	3.22	2.38
Technical report writing	2.34	2.26	2.50	2.50	2.00	2.00	2.00
*Basic science	2.08	1.85	1.73	2.13	3.50	2.90	2.69
Technical science	2.03	1.96	1.92	2.00	2.00	2.67	2.10
Advanced technical math	1.98	1.82	2.27	2.22	2.00	2.44	2.09

*$p < .05$

in order to be competitive in a world market. Higher order math, science, reading and writing skills were all perceived to be of lesser importance. The average scores for these skills placed them at the bottom of the list. While significant disagreement was evident on the perceived importance of basic science and the use of computers, a significant number of employers rated these skills as either "somewhat" or "not at all important". Thirty-seven percent of the respondents indicated either that the use of computers "does not apply" or was "not at all important". Basic science received the same ratings by over fifty percent of the employers. The skills perceived to be of greater importance, with average ratings between "important" and "very important", consisted of a mix of basic academic skills and basic work skills, with some disagreement as to the level of importance among respondents from different business/industrial areas.

Employers were asked to provide their perceptions of the importance of work attitudes and job holding abilities. All of the abilities had an average rating of over 3.0 (important), and the relative importance is shown by the ranking in the Table 3. There were statistically different responses on two of the abilities (noted by the asterisks).

All of the work attitudes and job holding abilities received an average rating equal to or higher than any on the employee skill list, with the exception of dress and/or appearance, and the ability to advance on the job. The attributes listed in Table 3 are required of successful employees, regardless of business or industry type. These attributes should also be taught in all vocational programs as part of preparing the student for employment. It is extremely doubtful that work attitudes and job holding abilities would be learned by students outside of a vocational education or work setting.

TABLE 3

Perceived Importance of Selected Abilities for Beginning Employees

Employee Abilities	Avg	Svc	Engy	Manuf/ Const	Trans	Health	Ag
Work attitudes (safety, quality of work, honesty, responsibility, etc.)	3.85	3.82	4.00	3.80	4.00	4.00	3.81
*Ability to get along with fellow workers/clients	3.77	3.84	3.60	3.64	4.00	3.79	3.47
Ability to complete assigned tasks on time	3.77	3.79	3.80	3.50	4.00	3.86	3.63
Ability to complete assigned tasks with minimal supervision	3.76	3.75	3.80	3.60	3.50	4.00	3.69
Ability to get along with supervisors	3.74	3.77	3.67	3.60	4.00	3.93	3.50
Work habits (punctuality, attendance, etc.)	3.59	3.65	3.33	3.30	3.50	3.79	3.41
Ability to adapt to new job situations	3.52	3.56	3.40	3.50	3.50	3.50	3.56
*Dress/Appearance	3.16	3.30	2.85	2.60	2.50	3.57	2.50
Ability to advance on the job	2.99	3.06	3.08	2.89	2.50	3.00	2.56

* $p < .05$

The final section selected for analysis in this report is that in which employers were asked to rank skills/abilities as to their relative importance. Three sections of five skills/abilities were ranked by the respondents, and there was significant statistical differences between the rankings based on industry type. The Tables 4, 5, and 6 indicate these differences. The skills and abilities are listed in rank order according to the entire sample, while the numbers under service, energy, manufacturing and construction, transportation, health and agriculture indicate how that skill/ability was ranked by respondents from those areas.

TABLE 4

Selected Skills and Abilities by Perceived Order of Importance

Skills and Abilities	Svc	Engy	Manuf/ Const	Trans	Health	Ag
Knowledge of job duties	2	2	1	1	1	2
*Oral communication skills	1	3	4	3	2	4
*Ability to use basic equipment.	4	1	1	2	4	1
Ability to adapt to new job situations	3	4	3	4	3	3
Basic math skills	5	5	5	5	5	5

TABLE 5

Selected Skills and Abilities by Perceived Order of Importance

Skills and Abilities	Svc	Engy	Manuf/ Const	Trans	Health	Ag
Ability to get along with fellow workers	1	1	2	2	1	1
*Transferability of job skills	2	2	1	5	2	2
Specific technical job information	3	3	3	1	3	3
Technical vocabulary skills	5	5	4	2	4	4
*Computer skills	4	4	5	5	5	5

TABLE 6

Selected Skills and Abilities by Perceived Order of Importance

Skills and Abilities	Svc	Engy	Manuf/ Const	Trans	Health	Ag
*Ability to work with public	1	4	4	3	1	5
*Ability to work independently	2	3	3	4	2	1
Specific job skills and abilities	3	2	1	1	4	3
*Ability to use tools and/or equipment	5	1	1	1	5	2
*Dress and/or appearance	4	5	5	5	3	4

* $p < .05$

SUMMARY

The most obvious conclusion to draw from analysis of the data provided by this survey is that the skills and abilities needed by beginning employees is very much dependent on the industry or business for which they are preparing. This is illustrated in Table 2 and Tables 4, 5 and 6. All respondents rated basic academic skills as important, but the data indicates that basic academic skills alone are not sufficient.

Employers responding to this survey indicate that over 57% of their beginning employees have a high school diploma or the equivalent. While additional education may be desirable, educational reformers must convince students that their interests lie in two to four years of additional education. The data from this study will not encourage students to stay in school longer in order to gain employment.

Ratings given to basic science, computer usage and advanced academic skills are at odds with educational reformers who wish to see the number of academic skill courses increased. This disparity could have several possible causes, among which is the possibility that the reformers have not accurately perceived the needs of industry and the public. Quite often attention has been focused on high technology industries which have a high growth rate but do not employ large numbers of workers. This survey did not concentrate on businesses and industry classified as high technology, but rather attempted to get a sense of all types of employers. Employers included in this survey ranged from those employing only a few workers to those employing hundreds, from construction firms, to mining firms, to hospitals and businesses providing services. Due to the broad representation of employers, this study provides a more comprehensive picture of the needs of business and industry than most recent studies have been able to accomplish.

IMPLICATIONS

The final efforts of any research project should be directed toward those who may benefit from the findings. The data and the recommendations presented in this report have important implications for school personnel at they make decisions concerning curriculum and programs.

Based upon the findings and conclusions reported in this study, the following recommendations are offered for consideration:

- There is no question that desirable work attitudes and habits should be taught and reinforced in schools.
- Since it is impossible to generalize all job entry requirements for all types of employers, school policymakers (administrators and teachers) should maintain close contact with employers and plan specialized vocational education programs that prepare for a broad range of occupations in a career cluster.
- Vocational education programs must reinforce work attitudes and habits, teach job skills that transfer across many occupations and insure that appropriate academic programs are in place to meet the needs of the respective occupational areas.