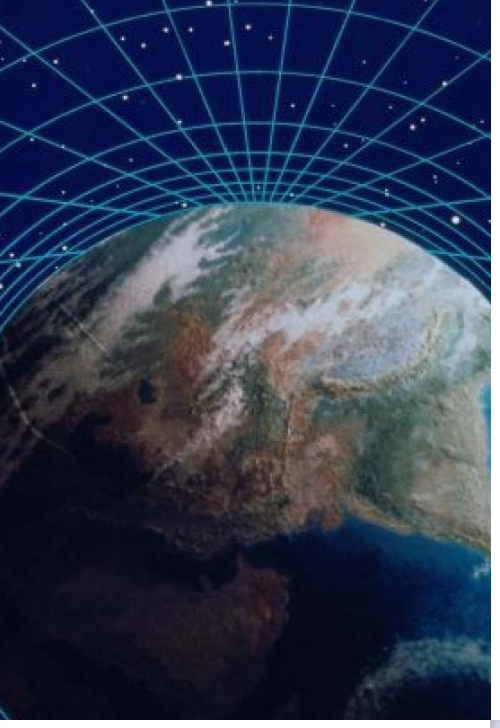

DUQUESNE UNIVERSITY

Providing students with useful information about job choices, and taking steps to prepare them for the jobs that interest them

the report

This report was written for teachers and guidance counselors in Southwestern Pennsylvania. First, it provides information on the wages and post-secondary educational requirements of “in-demand jobs” in the nine county area. This information can help students make early career decisions. Second, the report describes a method of identifying the skills and proficiencies necessary to obtain these jobs. Teachers can use this information to help students obtain the skills they need for their chosen career paths.

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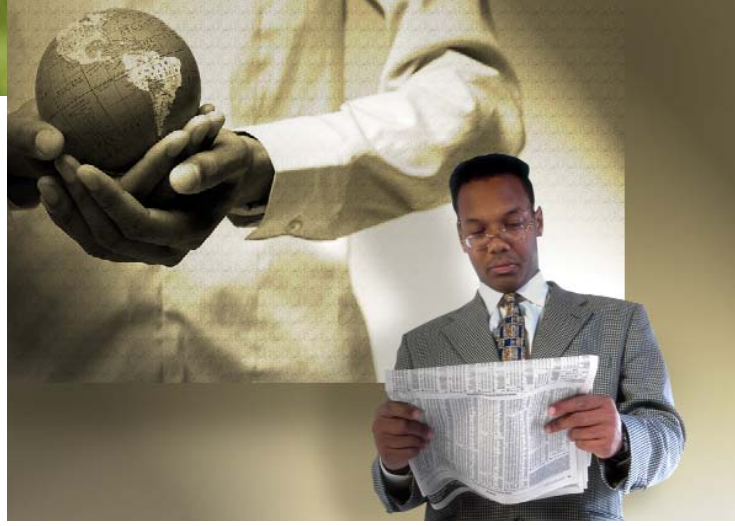


the report

Today's teachers play numerous roles – instructor, tutor, coach, advocate, referee, and occasionally law enforcement. Students in middle school or higher also look to teachers for career advice. Some of the traditional advice dispensed by teachers today is as true as it ever was. Advising students that working hard to succeed in their studies now will pay off in the job market later is certainly still true. Recommending that students obtain work experience as early as possible is good counsel. And today's teachers still know how to handle students with wildly unrealistic career goals (ex: NBA Star or American Idol Winner).

Providing Useful Information About Job Choices

But it remains true that teachers do not always have all the information they need to provide useful career guidance to students, especially with regard to specific jobs in Southwestern Pennsylvania. For example, which job is "better": "welder" or "emergency medical technician"? For the sake of an interested student, with a little on-line research, any dedicated teacher can figure out what the *content* of a job entails (i.e. what work and tasks are involved, what hours are required, or what kind of lifestyle is associated with the job). However, providing students information that helps them *decide between* jobs or careers can be a challenge. For any set of jobs that a student investigates and is interested in, what other criteria might help a student choose between them?

Two of the most common questions students ask about specific jobs are: (a) "how much money will I make?" and (b) "how much longer will I need to attend school to qualify?" These are good questions which really focus on two important criteria: the *costs* and *benefits* involved in securing a particular job. If education beyond the secondary level is required, students will want to know what it will cost them in money and additional time in the (possibly hated) classroom. Wages of course, represent key benefits.

But costs and benefits are not the only criteria that might help a student weigh jobs and early careers. An additional piece of information that a student might find useful is the amount of local *competition* he or she might face for a particular type of job opening. For example, a position that requires one year of specialized training and pays $40,000 a year sounds pretty good. But if one knew that 3,000 locally trained individuals were vying for a limited number of such positions, it might sound less good. Not only should the costs and benefits of a job be considered, but also the competitive risk associated with it. To make informed choices, students need realistic evaluations of their prospects for securing a position and building a career. Therefore it is important to put information about the costs and benefits of pursuing a job in the context of the job market, especially within the area of Southwestern Pennsylvania.

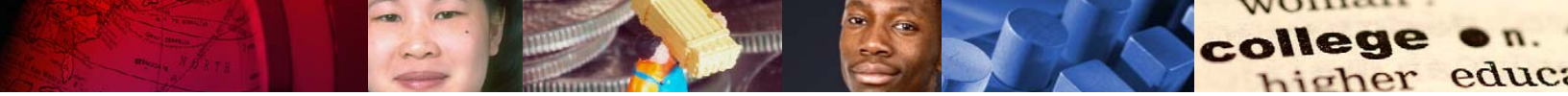
This report is a first step in helping teachers do just that. It provides some basic information on the costs (in terms of degree requirements), benefits (in terms of wages), and competitive risks associated with a special group of jobs in the local economy – positions where demand for people outstrips the supply of individuals available to fill anticipated job openings. We call this special set of occupations "*in-demand*" occupations.

We define the market for a particular job as a combination of the openings for such a job (demand for labor), as well as the number of people qualified to fill it (supply of labor). We looked at a nine county area[1] and identified jobs for which demand was not only large (i.e. state

table 1

Annual Openings, Wages, and Educational Requirements for "In-Demand" Occupations in the Nine County Area

	OCCUPATIONAL TITLE	ANNUAL OPENINGS	WAGES PER HOUR	WAGES PER YEAR
4-year degree or more	Physicians and surgeons	212	$68	$140,485
	Engineering, mathematical and natural sciences managers	153	$45	$93,193
	All other engineers	122	$31	$65,293
	Salespersons: scientific products and services	111	$28	$58,082
	Sales agents: securities, commodities, financial services	138	$27	$56,001
	Sales agents: insurance	96	$22	$45,378
	Sales agents: advertising	50	$20	$42,350
Less than 4-year degree	First line supervisors, sales and related	344	$25	$51,902
	First line supervisors, mechanics/installers	135	$23	$48,788
	Painters and paperhangers, construction	101	$21	$44,171
	Salespersons, except scientific	256	$21	$43,703
	Police patrol officers	300	$21	$43,553
	Other sales representatives and salespersons	71	$21	$43,464
	Aircraft pilots and flight engineers	86	$21	$43,140
	Engineering and related technicians	347	$19	$39,771
	Industrial machinery mechanics	59	$19	$39,643
	Flight attendants	221	$19	$38,820
	Telephone and cable TV installers and repairers	109	$18	$37,424
	First line supervisors, clerical and administrators	344	$25	$51,902
	Respiratory therapists	57	$18	$36,846
	Sales agents, selected business services	171	$18	$36,522
	Bus and truck mechanics, diesel engines	61	$17	$35,922
	Aircraft mechanics	88	$17	$35,856
	Other plant and system operators	56	$17	$35,724
	Secretaries, except legal and medical	458	$15	$30,781
	Physical and corrective therapy assistants	52	$15	$30,707
	Industrial truck and tractor operators	67	$14	$30,108
	Maintenance repairers, general utilities	296	$14	$29,693
	Human services workers	168	$14	$29,256



projections suggest 50 or more openings will occur locally per year) but also significantly exceeded supply.[2] Each occupation in the table above shares the following characteristics:

- at least 50 local openings per year are projected to occur over the next four years;
- local demand for qualified people to fill the position exceeds local supply by at least 150%;
- each pays a minimum of $12.50 an hour ($26,000 / year).

By comparison, the state projects that the average job opening for the local area will pay $17.56 an hour, with an annual salary of $36,525.

A close look at Table 1 reveals a number of things worth sharing with students. First, if one excludes the top three occupations in the "4 year degree or more" list (physicians, etc.), the difference between annual wages between "4 year degree or more" and "less than 4 year degree" occupations is not very large. Second, there are many more total openings requiring less than a four year degree than otherwise. Third, the relative absence of careers in information technology (IT) from the table is striking. State projections actually do indicate that IT occupations are indeed growing fast, however the current number of job openings for these jobs falls below the minimum 50 openings per year threshold we have set for "in-demand" positions. If the current growth rates of IT related positions continue, these jobs will certainly achieve "in-demand" status eventually. However since this report focuses on jobs that are "in-demand" now and over the next 4 years, we exclude them here.[3]

On the basis of state projections, we have calculated that there are an expected average 4,845 yearly openings for positions meeting the "in-demand" criteria above through 2008. It is worth noting that only 18% call for a 4 year degree or more, while fully 82% (3,963) require less (see Figure 1). These results confirm Penn State workforce researcher Ken Gray's assertion, based on national data, that the bulk of well-paid job vacancies in the economy require less than a four-year college degree.[4] This underscores the importance of providing students with a broad overview of careers available to them, *including* those that do not conform to commonly accepted view that "all students should go to college".

Finally, students that get excited about the occupations that do not require four years of postsecondary education need to be cautioned that these are by no means "easy" fields. They call for a combination of skills and competencies comparable in many respects to that of the occupations calling for four-year degrees. *Secondary students must come to an early understanding of what they need to do to access these careers – as much as they need to understand the more traditional, college-bound path.* But how can teachers help them do this?

Helping to Prepare Students for the Jobs that Interest Them

One method would be to identify the *profile of skills* associated with each occupation and translate them into *knowledge and competencies* that can be taught in schools. One tool for doing this is WorkKeys, an instrument that allows users to create skills profiles for both people and jobs.[5] Table 2 below presents the proficiency levels required for three skills (applied mathematics, reading for information, and locating information), according to WorkKeys, for the "in-demand" jobs from Table 1.

Teachers can use the numerical scores for the skill profiles below to develop educational content. For example, "Telephone and cable TV installers and repairers" has a score of "4, 4, 4," indicating that successful performance in this occupation is dependent on reaching a skill level "4" in applied mathematics, reading for information, and locating information. By consulting WorkKeys one can determine what level of skill these scores require. For example, according to WorkKeys, a person who has attained a level "4" in Applied Mathematics can[6]:

- "Perform one or two mathematical operations (addition, subtraction, multiplication, or division) using several positive or negative numbers."
- "Add commonly known fractions, decimals, or percentages, or add three fractions that share a common denominator."

FIGURE 1

Job Openings for In-Demand Occupations (by Degree Requirement)

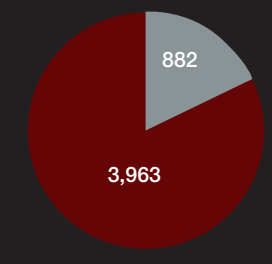


table 2

Skill Requirements of "In-Demand" Occupations

	OCCUPATIONAL TITLE	APPLIED MATHEMATICS	READING FOR INFORMATION	LOCATING INFORMATION	PROFILE SOURCE
4-year degree or more	Physicians and surgeons	6	6	5	E
	Engineering, mathematical and natural sciences managers	7	7	6	W
	All other engineers	5	6	6	W
	Salespersons: scientific products and services	4	4	5	A
	Sales agents: securities, commodities, financial services	5	5	4	A
	Sales agents: insurance	5	6	5	W
	Sales agents: advertising	6	4	5	W
Less than 4-year degree	First line supervisors, sales and related	5	5	5	W
	First line supervisors, mechanics/installers	5	5	5	W
	Painters and paperhangers, construction	3	3	3	W
	Salespersons, except scientific	4	5	4	W
	Police patrol officers	4	5	4	W
	Other sales representatives and salespersons	5	5	5	W
	Aircraft pilots and flight engineers	4	4	4	A
	Engineering and related technicians	6	5	5	A
	Industrial Machinery Mechanics	5	5	5	W
	Flight Attendants	3	4	4	A
	Telephone and cable TV installers and repairers	4	4	4	W
	First line supervisors, clerical and administrators	5	4	5	A
	Respiratory therapists	4	5	4	A
	Sales agents, selected business services	5	5	5	W
	Bus and truck mechanics, diesel engines	5	5	5	W
	Aircraft mechanics	4	5	4	A
	Other plant and system operators	4	3	4	W
	Secretaries, except legal and medical	5	5	4	W
	Physical and corrective therapy assistants	4	4	4	W
	Industrial truck and tractor operators	3	3	3	W
	Maintenance repairers, general utilities	3	4	4	W
	Human services workers	4	4	4	W

Profile sources — WorkKeys does not provide profiles for every occupation. "W" indicates the profile is a standard WorkKeys profile taken from ACT's occupational profile database. "A", or Aggregate WorkKeys Profile, is used when a specific job has not been profiled by ACT. These profiles were generated by selectively aggregating several relevant job profiles based on the original job title. "E" also refers to jobs which are not in ACT's WorkKeys database. Since all "E" job profiles call for advanced degrees, it can be safely assumed that a 6.5 is the minimum score required (ex: Physicians and Surgeons).

- "Calculate averages, simple ratios, proportions, and rates, using whole numbers and decimals."
- "Reorder verbal information before performing calculations."
- "Determine which operation(s) to perform and in what order."
- "Read a simple chart or graph to obtain the information needed to solve the problem."

WorkKeys also provides assessment tools for profiling the skills of *students*. As of January 2004 WorkKeys has been adopted by 100 school districts in Southwestern Pennsylvania, and over 30,000 students have been tested and received WorkKeys scores.[7] These scores can be used as a baseline to develop educational and career literacy plans. For example, if a student is interested in a particular job, a teacher can compare the skills profile of the student to the job that interests him or her to get a sense of the gap between their career goals and their achievement to date. Once the student's weak points are identified, teachers can use the information to create an action plan for the student, as well as motivate, coach, and/or (if time allows) design a curriculum to get the student back on track to achieving their career goals. This straightforward procedure has the potential of turning career counseling into a simpler, practical and speedier process – the last feature being important because of the well known work overload of public educators.

Encouraging Students to "Hedge Their Bets" Against the Uncertainties of the Job Market

The job market has built in risks and uncertainties, therefore it is always a good idea to encourage students not to "put all their eggs in one basket" and to develop and prepare for alternative career goals in addition to their favorite. This is an especially good strategy if the student's favored job is very competitive locally or simply unrealistic given the student's current skill profile. Even fairly "safe" career paths can fall victim to unforeseen events. For example, the state's projections of airline related jobs (see Table 1) are based on the assumption that past trends in growth would continue in the future. However, these assumptions did not anticipate the current situation with US Airways at Pittsburgh International Airport, which will likely result in fewer job openings than projected. Thus students should be encouraged to develop some secondary career goals. Teachers can use the approach already described to help students prepare for secondary career goals in the same manner as primary career goals.

Summary and Conclusion

This report suggests a number of actions – some straightforward and others less so – that teachers, counselors and other educators can take to assist students in making career choices and in succeeding in the labor market:

- Provide students information on the costs (educational requirements) and benefits (wages) of the jobs that interest them.
- Examine jobs in terms of demand and supply to give students a realistic evaluation of their prospects in securing a position and building a career.
- Drill down into the skills required by positions.
- Use WorkKeys profiles, if available, to compare the student's current skill profile with that required by occupations of interest to him or her. For the 100 school districts in Southwestern Pennsylvania, which have already introduced WorkKeys testing, this should pose few or no problems.
- If WorkKeys scores for students are not available, educators can utilize the detailed descriptions associated with each of the WorkKeys scales to build their own assessment of a student's current skills.
- Act upon on the gap between student and job skill profiles. Motivate, coach, and develop action plans to be implemented by the student.[8] The goal is to bring the student to the level required to successfully perform within the occupational field of his/her choice.
- Design problem-based curriculum to help students close the gap. If a telephone repairer and installer needs level 4 math, educators can work with employers to identify real-world installation problems to be utilized in class. Research indicates that real-world examples both engage and motivate students.
- Encourage students to "hedge their bets" and develop alternative career plans.

Given the complexity of these issues and the wide variation in student situations, tables 1 and 2 provide teachers a start in these directions but more dialogue and work is needed to help students navigate the questions that arise. Underlying these action-oriented recommendations is an important assumption that there is an increasing need to shape educational content — both for classroom teaching and for individual counseling and tutoring — in ways that promote student success in the workforce. Too many students are "playing by the rules" of the academic environment, but when they leave the protected halls of academia, they are ill equipped to succeed. This is not to say, obviously, that workforce education and expanding career choices is the sole goal of education. However, an interest in and a concern with the world of work must be present in the curriculum of middle and high school, to ensure that students understand early on what they must do to turn their dreams into reality, and to fundamentally increase — rather than narrow — their life choices. We hope that this issue of WorQ has made a small contribution in this direction.

about WorQ

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END NOTES

[1] Allegheny, Armstrong, Beaver, Butler, Fayette, Greene, Indiana, Washington and Westmoreland.

[2] Those interested in the technical approach we used to define demand and supply and generate the table are invited to read 'WorQ for Educators: Expanded Version' at *www.iet.duq.edu/ccwd*.

[3] It should be noted that IT skills are still important to many of these positions. Many have titles which mask their very large "IT component" – for instance "engineering, mathematical and natural sciences managers", "all other engineers", and secretaries.

[4] See "Other Ways to Win: Creating Alternatives for High School Graduates" by Kenneth C. Gray and Edwin L. Herr, Second Edition, Corwin Press, Inc., 2000.

[5] We are indebted to Keys2Work for preparing the WorkKeys profiles of the occupations highlighted in this report. WorkKeys® is a system of ACT™, Inc. WorkKeys® is a registered trademark of ACT, Inc. All WorkKeys products and materials are copyrighted by ACT, Inc. ACT is a trademark of ACT, Inc. See *http://www.act.org*. Keys2Work holds the local license for WorkKeys.

[6] For descriptions of other scores and other skill areas (like reading for information and looking up information) see 'WorQ for Educators: Expanded Version' at *www.iet.duq.edu/ccwd*.

[7] If WorkKeys scores for students are not available, educators can utilize the detailed descriptions associated with each of the WorkKeys scores to generate their own assessment of a student's current skills. This is obviously a much more cumbersome and time-consuming way of evaluating a student's prospects, but by no means impossible. A review of a student's records and a few simple tests should result in educators being able to assess an individual's skill profile fairly accurately. The major obstacle to this approach is clearly the time it would take, given the well known workload of teachers and guidance counselors.

[8] WorkKeys has associated software – Keytrain – that can help with the creation and implementation of skills remediation plans.