Public Policy Associates

Technical Documentation to Working

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Part 1: Overview of Working

What Is Working?

Working is a self-assessment of workplace skills. The assessment is designed to offer students insights into the skills employers require. The types of skills that workplaces want go beyond academic competencies and technical know-how. Working is designed to give students feedback on nine essential, transferable, workplace skills. Working is diagnostic and prescriptive. The results can be used by teachers to design instruction and by students to develop their own strategies to enhance their workplace success.

How Can Working Be Used?

Working is meant to be used as:

(1) a diagnostic measure to identify areas in which students could benefit most from educational interventions;

(2) a basis for creating individual plans for bolstering weaknesses and building on strengths; and,

(3) a counseling tool for those involved in helping students be successful in the workplace.

Working Scales

There are nine scales in Working, designed to assess each of nine key constructs. The scales are:

Taking Responsibility	Adapting to Change
Working in Teams	Permanent Problem Solving
Persisting	Information Processing
A Sense of Quality	Systems Thinking
Life-Long Learning	

The following paragraphs describe each of the scales and list the items included in each. Items which are negatively valanced and, thus, reverse scored are indicated with an (R). Bach scale, with the exceptions of Problem Solving and Systems Thinking, has six items. Problem Solving and Systems Thinking each have four items.

Taking Responsibility

In order to be successful at school and work, students must be willing to take personal responsibility for their assigned tasks. Students also need to be able to identify the range of actions that will lead to success and to make sure that they are done satisfactorily. If students do not take personal responsibility for task completion, they are unlikely to be successful in life, regardless of their natural abilities or talents.

Students' scores on this scale measure their desire to complete tasks they begin and to ensure that all aspects of a task are identified and done well. Students who score low on this measure need to work on learning strategies for identifying the components of a task and setting goals for task completion. Students who consistently neglect their responsibilities may need counseling on the long-term consequences of such behavior, particularly on their likelihood of succeeding in a job.

The items for this scale are:

I keep and use a list of things I've got to do.
It really bugs me to see a problem that no one is trying to solve.
I check up to make sure that others have done what they said they would do.
I don't usually think about what I need to do until it's almost time to do it. (R)
As soon as I finish one task, I look for another one to do.
I prefer to let others take the lead in getting something done. (R)

Working in Teams

One of the skills that employers consistently rank as most important to success in a career is the ability to work in teams. Teams are used to make products or deliver services, to solve problems, and to manage the work environment. Employees at all levels of an organization must be able to work with others to accomplish tasks and solve problems. Teamwork involves attention to both the goals of the group and to the social processes used to accomplish those goals. Students need to be skilled in both the task and the process of teamwork.

Students' scores on this scale measure the degree to which they feel comfortable working in teams and are able to use the skills associated with effective teamwork. Students who score low on this scale may need more experience in working in teams to accomplish a task. They need to

learn the qualities of an effective team member, including taking responsibility for individual assignments and for deciding how the team should accomplish its goal. Communication is also a critical factor in successful teamwork.

The items for this scale are:

I don't usually like others giving me suggestions on how I should do something. (R)
I like working in teams,
I have found that group decisions are often better than individual decisions.
I prefer to learn with other people.
I explain to others why we need to work together.
I'll frequently hold on to my opinion rather than compromise with the group. (R)

Persisting

The desire to stay with a task until it is completed satisfactorily is an essential quality for success in school, work, and life. Persisting involves the expenditure of time and effort to ensure that what is started is finished. Students who are able to persist until they master information or skills are at a definite advantage in school and work. Students must also be able to recognize when enough has been done and to not spend more time than is necessary on a task.

Students who score either low or very high on this scale may have trouble in this area. Students who score low have trouble sticking with a task or learning assignment long enough to see it to its satisfactory completion. They may give up too soon to really benefit from instruction. Students who score too high may be seen as stubborn and unwilling to compromise when such compromise is needed because of limited resources or available time.

The items for this scale are:

I won't let go of a problem until I've got it licked.
I follow through on things no matter what it takes.
I set definite goals, then keep working on them until I've achieved them.
If I can't catch onto something quickly, I sometimes just drop it. (R)
I get a job done even when it's much harder than I first thought.
I don't let go of something until I understand it.

A Sense of Quality

A focus on the quality of one's work is essential for successful performance at school and work. Students need to take pride in their work and to invest the energy and time needed to produce quality work. Appropriate attention to details is a key aspect of a student's orientation to quality, as is the desire to go beyond stated requirements to enhance a product. Without a desire to produce quality work, the completion of tasks is less meaningful.

Students who score low on this scale need help in understanding how exceeding expectations can help them succeed in everything they do. Students may need guidance in learning how to judge what is "just enough" versus "more than expected" and why doing more is beneficial. Students who score low are also likely to need help in focusing in on details and paying attention to the quality with which work is done, rather than simply doing work.

The items for the "sense of quality" scale are:

I do extra work to make sure things are done just right.
I won't settle for doing the minimum on anything, no matter what it takes.
I can't quit thinking about something until I'm sure I've done it very well.
I don't worry about the little details as long as I've done the main things okay. (R)
I seek out new activities and responsibilities.
I usually do my work with great care only if someone will be checking up on me. (R)

Life-Long Learning

The pace of change in information and skills dictates that everyone be willing and able to learn throughout their lifetime. Some studies predict that people will change careers up to five times during their working lives. Even those who stay in an occupational area will be confronted with rapidly changing knowledge and skill demands. In order to be successful, students must have the desire and the ability to continue to learn, whether from formal schooling or on their own. Employers identify the ability to learn as a key to success on a first job and to advancement to higher-level work.

Students' scores on this scale indicate an interest in engaging in learning in a variety of settings. Students who score low on this scale have a reluctance to look for learning opportunities and to

take advantage of them when they are presented. Students may need help in identifying the many places and ways in which they can learn that go beyond the traditional educational setting. Students who are not motivated to continue learning may find their skills obsolete sooner than they wish.

The items for this scale are:

I don't usually ask questions that go much beyond the immediate task at hand. (R)
I like to experiment with ideas and possibilities in my head.
I prefer to know what's in it for me before I spend a lot of effort learning something. (R)
I usually don't make a special effort to learn new things. (R)
I'm one of the first to volunteer to learn a new procedure or method.
When I have to wait, I will read anything I find lying around.

Adapting to Change

Organizations are experiencing change at a rapid rate. Employees who can be flexible and adapt to change are more likely to be retained by an organization and to be successful in it. When people and organizations undergo frequent changes, the ability to thrive in ambiguous environments can help an employee to feel less stress. A student's sense that change is not threatening and that it can be managed for positive outcomes is an important component of success in the workplace.

Students' scores on this scale indicate their level of comfort with frequent or major changes in their environment. Students who score low are less likely to seek out new experiences or to adjust to changes they experience. Students with a low tolerance for change may have trouble working in many environments where change is the norm. They need counseling to help them identify ways in which they can increase their ability to adapt to change.

The items for this scale are:

I adapt quickly to new situations.
I usually do something I've enjoyed rather than try something different. (R)
I am uncomfortable when I have to handle several things at once.
I worry a lot about what could happen when things are changing. (R)
I am usually most comfortable when things are predictable.
It can take me a long time to get used to a major change in my life. (R)

Permanent Problem Solving

Organizations must be concerned with the ability of employees to actively participate in solving its problems. Employees need to be able to recognize problems and to use systematic methods for identifying the components of a problem and developing solutions to it. Whether working alone or with others, organizations rely on employees to help them improve by permanently solving a range of problems.

Students' scores on this scale indicate their interest and skill at using systematic problem solving methods when approaching complex problems. Students who score low need help in understanding how to approach problems in a step-by-step fashion. Experience in using the scientific method or other systematic problem solving approach should help them increase their skills in this area.

The items for the "problem solving" scale are:

When solving a problem, I keep double-checking to be sure I'm on the right track.
I make a detailed plan before I tackle a complex problem.
I consciously consider several different approaches before tackling a problem.
I will offer a suggested solution whenever I bring up a problem to someone.

Information Processing

The ability to organize information so that it is connected to past experiences and to other knowledge enhances its usefulness. When learning a new skill or subject, students who can use a variety of strategies to build bridges to what they already know will have a distinct advantage. Students who understand their own learning process can use that understanding to learn material more rapidly and more completely. Since the ability to learn is valued highly by organizations, effective information processing plays a role in employees' workplace success.

Students' scores on this scale provide insights into their competence in managing their own learning and in having and using multiple strategies when learning. Students who score low on this measure need to learn methods that they can use to help add meaning and organization to

what they are trying to learn. Encouraging students to make active connections to their prior knowledge and experience is important. Equally important may be many basic study skill techniques, like outlining, paraphrasing, and summarizing.

The items for this scale are:

I learn by figuring out how I can apply the things I'm learning to my life.
When trying to understand something complicated, I carefully break it into parts.
When learning something, I first think carefully about the very best way to tackle it.
I understand new things by seeing how they fit with what I already know.
I consciously ask myself questions to see how well I understand something.
I make a mental picture of what I am trying to learn or solve.

Systems Thinking

As organizations assign responsibility for production and problem solving to all levels, it becomes essential that all employees understand how their work fits into the overall goals of the organization. Employees who use systems thinking can see the interrelationships of the parts of the organization and understand how actions in one part affect other parts. Systems thinking enhances the ability of employees to find permanent solutions to problems.

Students' scores on this scale indicate their understanding of the relationship among parts in a system and the effects of actions within a system. Students who have a working knowledge of one system may still need help in translating that knowledge into general principles of systems thinking. Students who score low may be helped by learning the components of a specific system before being introduced to these general principles. These students need to understand that events do not happen in isolation and that their actions may have effects that are distant in time or space.

The items for the "systems thinking" scale are:

I want to see how one task is related to other tasks.
I tackle a problem by first trying to see how it affects others.
I frequently come up with new ideas for how to do things better.
I know how to get things done in a system or an organization.

The following sections describe the development and validation of the nine scales described above.

Part 2: The Development of Working

Selection of Scale Constructs

National attention has been focused on the need to extend the types and levels of skills that workers bring to employers, particularly as employers become "high performance" workplaces. A number of national- and state-level surveys have identified the skills that employers report they want from successful employees (Carnevale, Gainer, & Meltzer, 1991; Commission on the Skills of the American Workforce: high skills or low wages!, 1990; Michigan Employability Skills Task Force, 1987; Secretary's Commission on Achieving Necessary Skills, 1991). These skills go far beyond the ability to perform specific job tasks. They focus on skills related to working in teams, orientation to learning, problem solving and decision making abilities, and the ability to adapt to change. These skills are seen as being both essential and transferable across a number of workplace settings. Educational institutions at all levels have a role to play in helping students understand the changed requirements of the workplace and in helping them acquire the skills they need. Student self-assessment can serve both these purposes.

In creating Working, national- and state-level surveys of workplace skills and a variety of books and articles were reviewed to determine the skill areas identified as most critical by employers (Carnevale, Gainer, & Meltzer, 1991; Miles, 1994; Michigan Employability Skills Task Force, 1987; Secretary's Commission on Achieving Necessary Skills, 1991). A matrix of 24 potential competency areas that might be included in a self-assessment was developed. It was reviewed by a panel of experts, based on the competency's prevalence in the literature as a required workplace skill, its ability to be taught or trained, and the clarity with which it could be defined in an assessment. Based on that analysis, the list of 24 potential competency areas was collapsed into nine. These are the nine scale areas presently included in Working.

Item Construction

Following the identification of the nine scale areas, items were developed for each scale. These items were compiled into a pilot version that also included social desirability items (from Strahan & Gerbasi, 1972). The pilot version was administered to a small sample of community college students and reviewed by a panel of psychometricians. The measure of social desirability was used to determine the degree of relationship between the responses to the individual items and students' desire to be socially acceptable. The desire to answer in socially acceptable ways can create problems in self-response assessments, so it was important to identify any items that were particularly associated with social desirability. Items correlating with the measure of social desirability were eliminated from the field-test version, as was the social desirability measure. The pilot group was also asked to answer a series of questions about the assessment concerning difficulties in understanding items, the face validity of the assessment, and any suggestions for improvement.

Field Testing

Based on the analysis of the pilot responses, a version of Working was prepared for field testing. Students at community colleges and four-year institutions participated in the field test during the Fall of 1995. Institutions were recruited via the Internet and personal contact. Field test packets were sent to 16 different institutions, with 13 institutions returning materials for analysis. The 13 institutions were from 11 different states and represented institutions in rural, suburban, and urban areas (see Table 1). Site administrators were asked to recruit English teachers to administer Working to 1-2 classes of no more than 30 students each. Previous research (Grummon, 1995) indicated that English classes provide the best access to diverse populations in community colleges since nearly all students take English classes of one form or another.

Table 1: Participating States

State	Type of College
Arizona	Community College
Florida	Community College
Florida	Community College
Illinois	Community College
Kansas	Community College
Minnesota	Community College
Nebraska	Community College
New Mexico	State University
North Carolina	Technical College
Oregon	State University
Oregon	Community College
Tennessee	Community College
Wisconsin	Technical College

Within each classroom, students were asked to complete the 85 items in Working and a nine-item summary scale at the end of the assessment (e.g., How would I rate myself in terms of my teamwork?). Teachers were asked to complete the nine-item summary scale on all students and a full version of Working (i.e., 85 items) on a 20% random sample of the students who completed the assessment. In addition, students were encouraged to take a copy of Working to their employer for completion.

Respondent Demographics

The 94-item field-test instrument (i.e., 85 scale items and a nine-item summary scale) took students an average of nearly 30 minutes to complete. As such, it was a rather tedious assignment. It appeared that this resulted in a number of student participants not taking the assignment seriously and completing the instrument in a haphazard manner. Approximately 15 returned instruments were either incomplete or seemed to have completely random and inconsistent responses. These instruments were eliminated from the data analysis. A total of 640 students returned usable score sheets, and this data was used in final scale construction.

Gender. Of the valid responses, 63% were from female students and 37% were from male students.

Education. Over 67% of the participants were freshmen in college. Nearly 17% were sophomores, while 3% were juniors and less than 1% were seniors. An additional 3% were high school seniors taking classes in community colleges and 9% did not indicate their grade level.

Age. While the ages of respondents ranged from 16 to 64, less than 3% were younger than 18. More than 50% of the participating students were between the ages of 18 and 19. Approximately 20% ranged from 20 to 23 years, another 10% were between 24 and 29 years old and another 10% were between 30 and 39 years old. The remaining 7% were either over 40 or did not report their age.

Work Experience. More than 70% of the respondents were working at least part-time when they completed the field test. While approximately a third (34%) were working between 20 and 39 hours per week, nearly 10% were working full-time. Furthermore, a third (33%) of the respondents had held a job for at least five years, and half of those (16% of the respondents) had held a job for more than 10 years.

Grade Point Average. Students were asked to provide an estimate of their grade point average at the time they completed the survey. However, approximately 15% of the respondents left this item blank. Nearly 13% reported that their GPA was below a 2.5, 20% reported a GPA between 2.5 and 3.0, 28% indicated their GPA was between a 3.0 and a 3.5, and 25% said they had a GPA of 3.5 or better.

Part 3: Validation of Working Reliability Analysis

The 85 scale items were analyzed to determine how they contributed to the reliability of their assigned construct. Using SPSS/PC+, reliability analysis was run on each of the hypothesized scales. Items which did not contribute significantly to the reliability of their intended scales were

dropped from the instrument (e.g., negatively or weakly correlated items). The total number of items was thus reduced from 85 to 50. Coefficient Alphas for the scales range from a low of .52 to a high of .75, thus indicating sufficient reliability of the scales.

Table 2: Scale Summary Statistics

Scale	Mean Score	N	Standardized Alpha
Taking Responsibility	20.85	640	.55
Working in Teams	20.09	638	.59
Persisting	22.19	639	.75
A Sense of Quality	21.16	639	.64
Life-Long Learning	20.88	635	.55
Adapting to Change	18.23	640	.61
Permanent Problem Solving	13.38	638	.57
Information Processing	20.54	640	.72
Systems Thinking	13.12	632	.52

In the development of the scales, both five- and seven-point scoring options were considered. Consultation with a number of psychometric experts indicated that a five-point system would make more sense to the respondents and could more easily have descriptors attached to each point. Using a seven-point scoring system might have been more confusing for respondents and could have been more time-consuming. Thus, the following five-point scoring system was developed:

1 = almost never like me
2 = occasionally like me
3 = moderately like me
4 quite a bit like me
5 = almost always like me

The disadvantage of a five-point system is that it generally narrows the range of responses. Since respondents tended to avoid the extreme scores (i.e., "almost always" and "almost never"), the data were effected by a restriction in range. Variance is a prerequisite to covariance, thus, the smaller the range of scores in a scale, the less opportunity there is for strong correlations. In reliability analysis, this translates to smaller Alpha values.

Validity Evidence

The initial validation of Working looked at the relationship between teachers' and students' perceptions of their skills; students' level of experience and their responses on Working; and students' grade point averages (OPA) and their responses on the assessment. Not enough employer assessments were returned for analysis purposes. There were no significant differences in years of work experience between the men and women in the study. There was also no statistical significance between women and men's GPA, although the t-test did approach significance with women having a slightly higher average OPA.

Teachers' perceptions of students' strengths and weaknesses on Working were very similar. Teachers returned full assessments on 98 students that could be matched with students' self-assessments. The only scale where students' and teachers' perceptions were not significantly correlated was Accepting Change. It is likely that the teachers in this sample, who had the students in class for less than two months, simply did not have enough information to know how a student responds to changes in his or her life. In the cases of the other scales, teachers' and students' views of students' skills were convergent. There is evidence, then, that Working provides information to a student that is supported by how others see the student and by the student's own experiences with work and school.

Table 3: Student-Teacher Correlations

Scale	T Pearson (r)	Count (n) T	Probability (p)
Taking Responsibility	.17	108	p<.05
Working in Teams	.20	107	p<.05
Persisting	.17	107	p<.05
A Sense of Quality	.28	108	p<.01
Life-Long Learning	.23	108	p<.01
Adapting to Change	.11	103	not significant
Permanent Problem Solving	.17	104	p <.05
Information Processing	.18	98	p <.05
Systems Thinking	.33	106	p<.01

As would be expected for convergent validity, years of work experience were significantly correlated with all of the scales except teamwork, which approached significance. Given the uneven use of teams in work settings, it is not surprising that students with more experience at work do not necessarily have more experience, and hence higher skills, with working on teams. Grade point average was significantly correlated with 6 of the 9 scales. It was not related to working in teams, adapting to change, or systems thinking. The concepts represented by these scales are not ones typically taught in most schools and so would be unlikely to affect a student's GPA. The six scales that are correlated with GPA are generally included in one way or another in most students' schooling experience (e.g., problem solving, persistence, responsibility, etc.). Thus, the pattern of correlations with students' GPAs is one that supports both convergent and divergent validity, as GPA is related to workplace skills explicitly taught in educational settings and not related to those skills that are predominately learned and assessed elsewhere. As would be expected, years of work experience and GPA were not significantly correlated.

Table 4: Scale Correlations with Work Experience and GPA

	Work Experience			Grade Point Average (GPA)		
Scale	**r**	**n**	**p**	**r**	**n**	**p**
Taking Responsibility	.24	566	p <.01	.22	547	p <.01
Working in Teams	.07	565	ns	.01	546	ns
Persisting	.28	565	p<.01	.25	546	p<.01
A Sense of Quality	.21	566	p<.01	.25	547	p<.01
Life-Long Learning	.31	565	p<.01	.14	546	p<.01
Adapting to Change	.20	565	p <.01	.04	546	ns
Problem Solving	.19	565	p<.01	.16	546	p<.01
Information Processing	.14	566	p <.01	.10	547	p <.01
Systems Thinking	.19	565	p <.01	.06	546	ns

Scoring

Working yields nine individual scale scores, one for each of the nine scales. The scale score is equal to the total number of "points" achieved on the items in a scale. Each response category is associated with a certain number of points (e.g., "almost always like me" equals 5 points).

Scores for the 16 reverse-coded items are inverted on the student score sheet so that more positive responses always equal more points and more negative responses always equal fewer points. Thus, the range of total points possible for each of the six-item scales is 6 to 30 and for each of the four-item scales the range is 4 to 20.

In order for students to understand what their scores on each scale mean, percentile equivalents for the scaled scores were developed from the field-test results. Percentile values indicate what percent of all students in the field test achieved a particular score. For example, on the problem solving scale, 25% of the respondents scored at least an 11 and 50% of respondents scored at least a 13. Therefore, if a student scores an 11 on problem solving, his/her skills are as strong as about 25% of those students who took the field test. This allows students to judge the strength of their skills relative to other students.

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