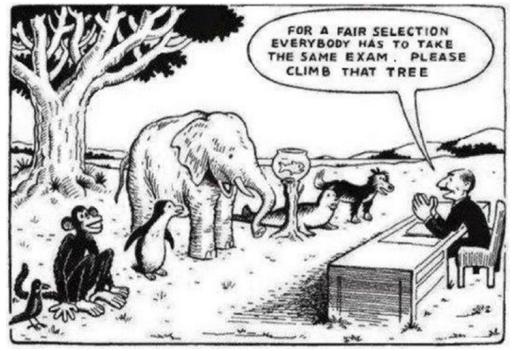
TALLINN UNIVERSITY OF TECHNOLOGY

Testing basic knowledge and skills. Competences

4th Lecture



2

DIN 33430

DIN 33430. Requirements for proficiency assessment procedures and their implementation. German Standard published in June 2002

This norm serves:

- Service organizations (internal and external contractors within an organization according to this norm) as a guide for the planning and implementation of proficiency assessments;
- Clients within organizations as a standard for the evaluation of external proficiency assessment offers;
- Individuals responsible for personnel who ensure the quality and optimization of personnel decisions and;
- To protect candidates from improper use or abuse of proficiency assessment procedures.

3

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Norm contributes:

- To the wide-spread **implementation of scientifically and professionally sound proficiency assessment procedures**;
- To the correct development and implementation of proficiency assessment procedures;
- To the continual improvement of proficiency assessment procedures.
- Decision-making errors, as well as the resulting negative economic, social and individual effects that often accompany the use of low quality proficiency assessment procedures, can be avoided by using this norm.

4

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Skill

- **Skill** [uncountable] **- the ability to do something well, usually as a result of experience and training**
  - *I admired the skill and dedication of the nursing staff.*
  - *The committee needs someone who has some skill in financial planning.*
- **Skill** [countable] **- a particular ability that involves special training and experience**
  - *The course helps people gain the skills they need to run a successful business.*
  - *academic/technical/practical skills*
- **American English synonyms or related words for this sense of skill:**
  - **Talent** - a natural ability for being good at a particular activity.
  - **Ability** - the fact of being able to do something
  - **Experience** - knowledge and skill that is gained through time spent doing a job or activity
  - **Competence** - the ability to do something in a satisfactory or effective way
  - **Mastery** - great knowledge or skill
  - **Prowess** - great skill or ability
  - **Aptitude** - natural ability that makes it easy for you to do something well
  - **Proficiency** - a high degree of ability or skill in something
  - **Gift** - a natural ability to do something well

Macmillan Dictionary

5

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Competence

Competence - the ability to do something in a satisfactory or effective way

- a. [formal] a person's range of skills or knowledge
- b. a skill needed for doing a particular job or carrying out a particular task

Core competence - a skill or type of knowledge that makes an organization especially good at doing some things and gives it an advantage over other organizations

Macmillan Dictionary

6

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Competency

A competency is more than just knowledge and skills. It involves the ability to meet complex demands, by drawing on and mobilising psychosocial resources (including skills and attitudes) in a particular context.

For example, the ability to communicate effectively is a competency that may draw on an individual's knowledge of language, practical IT skills and attitudes towards those with whom he or she is communicating.

Key competency must:

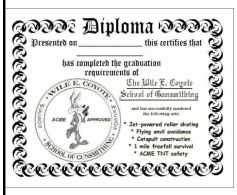
- Contribute to valued outcomes for societies and individuals;
- Help individuals meet important demands in a wide variety of contexts; and
- Be important not just for specialists but for all individuals.

Organization for Economic Cooperation and Development (2005). Definition and selection of key competencies: Executive summary. http://www.oecd.org/dataoecd/47/61/35070367.pdf

7

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Employer's challenges



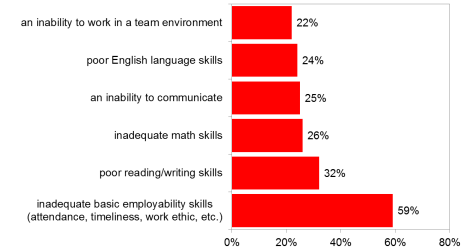
- **Language challenge** – immigrants with limited (English) language skills
- **Education credential challenge** – adults who lack a high school diploma
- **New literacy challenge** – low-skilled workers who posess high school credentials and are not illiterate in the traditional sense but have limited reading, math and analytical skills

Comings et al., 2000

8

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Skill deficiencies in current hourly production employees



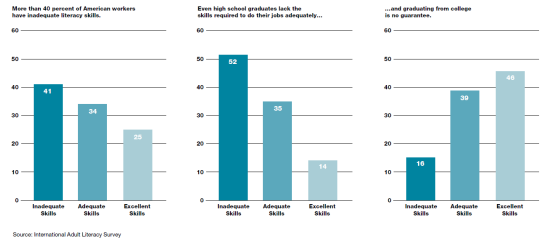
National Associate of Manufacturers (2002). The skills gap 2001

9

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Throughout the U.S., private- and public-sector companies are facing the problem of a workforce severely lacking in basic workplace skills.

Michael Bloom and Brenda LaFleur



Source: International Adult Literacy Survey

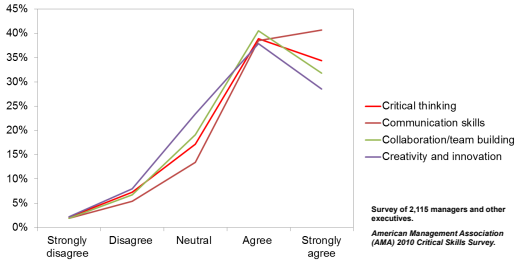
Stein (2000). Equipped for the Future Content Standards - What Adults Need to Know and Be Able to Do in the 21st Century. http://eff.cls.utk.edu/PDF/standards_guide.pdf

10

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Skills and competencies articulated within organizations

The following skills and competencies have been articulated within my organization as priorities for employee development, talent management, and succession planning in the next one to three years.



Survey of 2,115 managers and other executives.

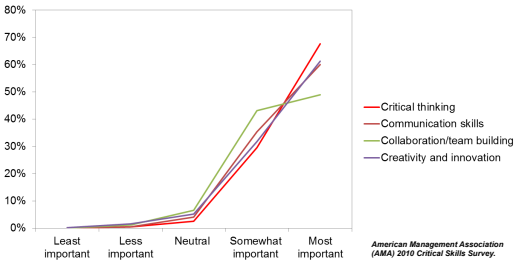
American Management Association (AMA) 2010 Critical Skills Survey.

11

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Skills and competencies by their level of importance in helping to grow

As the economy improves, please rate the following skills and competencies by their level of importance in helping to grow your organization.



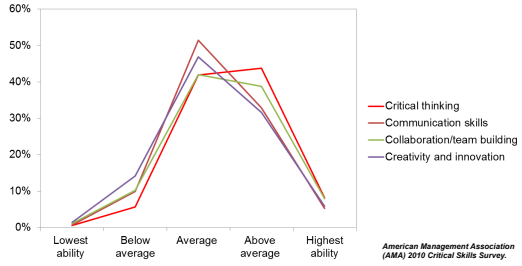
American Management Association (AMA) 2010 Critical Skills Survey.

12

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Abilities of employees

As a whole, please rate your employees in terms of their abilities in the following skills and competencies.



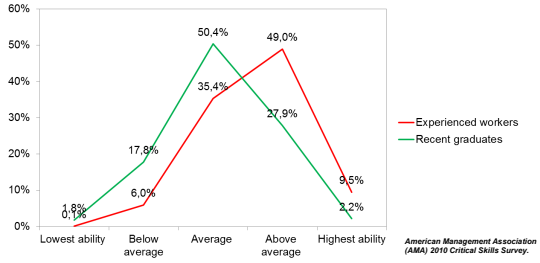
American Management Association (AMA) 2010 Critical Skills Survey.

13

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Skill levels of the experienced workers versus the recent graduates

How would you compare the skill levels (critical thinking, communication, collaboration, and creativity) of the experienced workers versus the recent graduates within your organization?



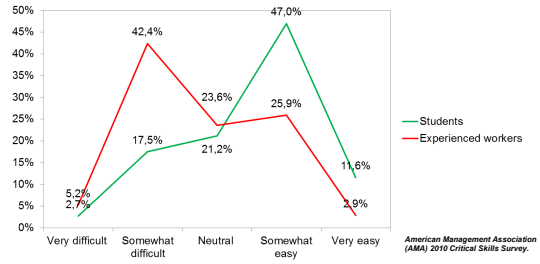
American Management Association (AMA) 2010 Critical Skills Survey.

14

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Training students and experienced workers

In your opinion, how feasible is it to train/develop these skills and competencies (critical thinking, communication, collaboration, and creativity) in students and experienced workers.



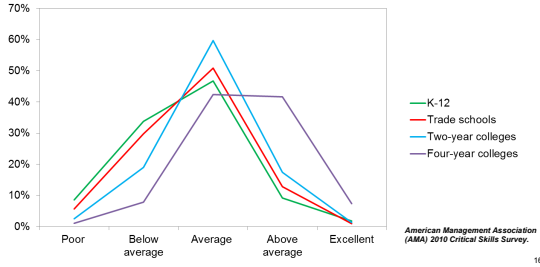
American Management Association (AMA) 2010 Critical Skills Survey.

15

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Rating of the education systems by their ability to prepare students

Please rate the following education systems by their ability to prepare students in the four Cs (critical thinking, communication, collaboration, and creativity) to ensure those entering the workforce are proficient in these areas.



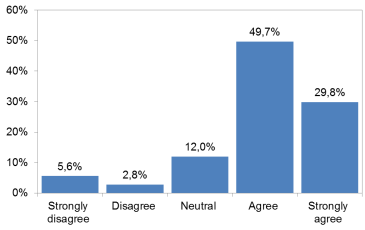
American Management Association (AMA) 2010 Critical Skills Survey.

16

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Fusing the three Rs with the four Cs

Do you agree that fusing the three Rs (reading, writing, and arithmetic) with the four Cs (critical thinking, communication, collaboration, and creativity) ensures 21st-century readiness for students today?



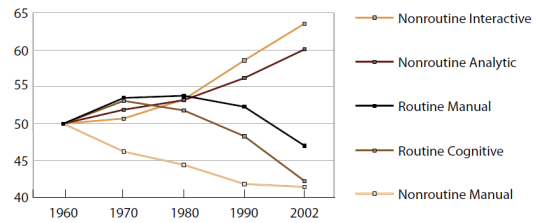
American Management Association (AMA) 2010 Critical Skills Survey.

17

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

How the demand for skills has changed

Economy-wide measures of routine and non-routine task input



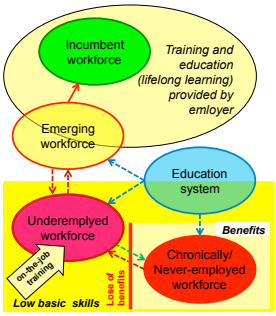
As research by economists Frank Levy and Richard Murnane shows, the routine skills used in factory jobs that once fueled an industrial economy have declined sharply in demand as they are computerized, outsourced, or made extinct by the changing nature of work. The skills in greatest demand are the non-routine interactive skills that allow for collaborative invention and problem solving.

Darling-Hammond, L. & Adamson, F. (2010). Beyond basic skills: The role of performance assessment in achieving 21st century standards of learning

18

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Basic skills and workforce development



- **Incumbent workforce** – employed on a continuing basis in full-time or part-time employment, training provided by their company
- **Emerging workforce** – develops into the incumbent workforce
- **Underemployed workforce** – „working poor", working for minimal wage, almost never received benefits from employer. Provide services that are fundamental to the business's mission and/or operations
- **Chronically/Never-employed workforce** – welfare, illegal activities, etc

US Department of Labor (2000). Workplace Essential Skills. Resources Related to the SCANS Competencies and Foundation Skills

19

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Categories of Basic Employment/Work Skills

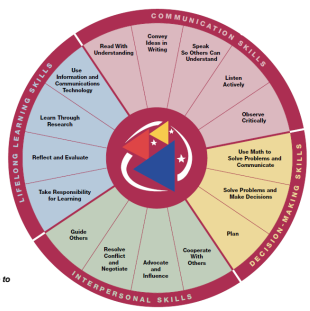
Basic Academic Skills	Arithmetic / Mathematics Reading Writing Speaking Listening
Higher Order Thinking Skills	Creative/divergent Decision making Problem solving Knowing how to learn
Interpersonal and Teamwork Skills	Negotiation Teaches/mentors others Appreciates diversity Interpersonal Group process
Personal Characteristics	Integrity Self Management Responsibility Self-esteem

O'Neil et al. (1997)

20

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

The National Institute for Literacy (NIFL)
Equipped for the Future Standards



Stein (2000). Equipped for the Future Content Standards - What Adults Need to Know and Be Able to Do in the 21st Century. http://eff.cls.utk.edu/PDF/standards_guide.pdf

21

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Equipped for the future

Citizen/Community Member Role Map

Effective citizens and community members take informed action to make a positive difference in their lives, communities, and world.

BROAD AREAS OF RESPONSIBILITY

Become and Stay Informed
Citizens and community members find and use information to identify and solve problems and contribute to the community

- Identify, monitor, and anticipate problems, community needs, strengths, and resources for yourself and others
- Recognize and understand human, legal, and civic rights and responsibilities for yourself and others
- Figure out how the system that affects an issue works
- Identify how to have an impact and recognize that individuals can make a difference
- Find, interpret, analyze, and use diverse sources of information, including personal experience

Form and Express Opinions and Ideas
Citizens and community members develop a personal voice and use it individually and as a group

- Strengthen and express a sense of self that reflects personal history, values, beliefs, and roles in the larger community
- Learn from others' experiences and ideas
- Communicate so that others understand
- Reflect on and reevaluate your own opinions and ideas

Work Together
Citizens and community members interact with other people to get things done toward a common purpose

- Get involved in the community and get others involved
- Respect others and work to eliminate discrimination and prejudice
- Define common values, visions, and goals
- Manage and resolve conflict
- Participate in group processes and decision making

Take Action to Strengthen Communities
Citizens and community members exercise their rights and responsibilities as individuals and as members of groups to improve the world around them

- Help yourself and others
- Educate others
- Influence decision makers and hold them accountable
- Provide leadership within the community

KEY ACTIVITIES

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Equipped for the future

Parent/Family Role Map

Effective family members contribute to building and maintaining a strong family system that promotes growth and development

BROAD AREAS OF RESPONSIBILITY

Promote Family Members' Growth and Development
Family members support the growth and development of all family members, including themselves

- Make and pursue plans for self-improvement
- Guide and mentor other family members
- Foster informal education of children
- Support children's formal education
- Direct and discipline children

Meet Family Needs and Responsibilities
Family members meet the needs and responsibilities of the family unit

- Provide for safety and physical needs
- Manage family resources
- Balance priorities to meet multiple needs and responsibilities
- Give and receive support outside the immediate family

Strengthen the Family System
Family members create and maintain a strong sense of family

- Create a vision for the family and work to achieve it
- Promote values, ethics, and cultural heritage within the family
- Form and maintain supportive family relationships
- Provide opportunities for each family member to experience success
- Encourage open communication among the generations

KEY ACTIVITIES

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Equipped for the future

Worker Role Map

Effective workers adapt to change and actively participate in meeting the demands of a changing workplace in a changing world.

BROAD AREAS OF RESPONSIBILITY

Do the Work
Workers use personal and organizational resources to perform their work and adapt to changing work demands

- Organize, plan, and prioritize work
- Use technology, resources, and other work tools to put ideas and work directions into action
- Respond to and meet new work challenges
- Take responsibility for assuring work quality, safety, and results

Work With Others
Workers interact one-on-one and participate as members of a team to meet job requirements

- Communicate with others inside and outside the organization
- Give assistance, motivation, and direction
- Seek and receive assistance, support, motivation, and direction
- Value people different from yourself

Work Within the Big Picture
Workers recognize that formal and informal expectations shape options in their work lives and often influence their level of success

- Work within organizational norms
- Respect organizational goals, performance, and structure to guide work activities
- Balance individual roles and needs with those of the organization
- Guide individual and organizational priorities based on industry trends, labor laws/contracts, and competitive practices

Plan and Direct Personal and Professional Growth
Workers prepare themselves for the changing demands of the economy through personal renewal and growth

- Balance and support work, career, and personal needs
- Pursue work activities that provide personal satisfaction and meaning
- Plan, renew, and pursue personal and career goals
- Learn new skills

KEY ACTIVITIES

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Equipped for the Future Standards define the 16 core knowledge and skills adults need to effectively carry out their roles as parents, citizens, and workers:

Communication Skills	Read With Understanding Convey Ideas in Writing Speak So Others Can Understand Listen Actively Observe Critically
Decision-Making Skills	Solve Problems and Make Decisions Plan Use Math to Solve Problems and Communicate
Interpersonal Skills	Cooperate With Others Guide Others Advocate and Influence Resolve Conflict and Negotiate
Lifelong Learning Skills	Take Responsibility for Learning Learn Through Research Reflect and Evaluate Use Information and Communications Technology

Stein (2000). Equipped for the Future Content Standards - What Adults Need to Know and Be Able to Do in the 21st Century. http://eff.cls.utk.edu/PDF/standards_guide.pdf

25

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

EFF performance asessment:

- Read with Understanding
- Convey Ideas in Writing
- Listen Actively
- Speak So Others Can Understand
- Use Math to Solve Problems and Communicate
- Use Information and Communications Technology
- Cooperate with Others
- Resolve Conflict and Negotiate
- Solve Problems and Make Decisions
- Learn Through Research
- Take Responsibility for Learning

http://eff.cls.utk.edu/assessment/arc_library.htm

26

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Secretary's Commission on Achieving Necessary Skills (SCANS)

The Secretary's (Secretary of Labor) Commission on Achieving Necessary Skills (SCANS) was established in February 1990 to examine the demands of the work place and to determine whether the current and future workforce is capable of meeting those demands. Commission members included 31 representatives from the nation's schools, businesses, unions and government.

Commission was asked to:

1.Define the skills needed for employment;

2.Propose acceptable levels in those skills;

3.Suggest effective ways to assess proficiency; and

4.Develop a strategy to disseminate the findings to the nation's schools, businesses and homes.

27

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

WORKPLACE KNOW-HOW

The know-how identified by SCANS is made up of five competencies and a three-part foundation of skills and personal qualities needed for solid job performance. These include:

COMPETENCIES Effective workers can productively use:

- **Resources:** allocating time, money, materials, space, staff
- **Interpersonal Skills:** working on teams, teaching others, serving customers, leading, negotiating, and working well with people from culturally diverse backgrounds;
- **Information:** acquiring and evaluating data, organizing and maintaining files, interpreting and communication and using computers to process-information;
- **Systems:** understanding social, organizational, and technological systems, monitoring and correcting performance, and designing or improving systems;
- **Technology:** selecting equipment and tools, applying technology to specific tasks, and maintaining and troubleshooting technologies.

THE FOUNDATION. Competence requires:

- **Basic Skills:** reading, writing, arithmetic and mathematics, speaking and listening;
- **Thinking Skills:** thinking creatively, making decisions, solving problems, seeing things in the mind's eye, knowing : how to learn, and reasoning;
- **Personal Qualities:** individual responsibility, self-esteem, sociability, self-management and integrity.

US Department of Labor (1993) Teaching the SCANS Competencies

28

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Basic Skills

Reading

- locates, understands, and interprets written information in prose and documents, including manuals, graphs, and schedules;
- learns from text by determining the main idea or essential message;
- identifies relevant details, facts, and specifications;
- infers or locates the meaning of unknown or technical vocabulary;
- judges the accuracy, appropriateness, style, and plausibility of reports, proposals, and theories of other writers.

US Department of Labor (2000). Workplace Essential Skills. Resources Related to the SCANS Competencies and Foundation Skills

29

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Basic Skills

Writing

- communicates thoughts, ideas, information, and messages in writing;
- records information completely and accurately, composes and creates documents such as letters, directions, manuals, reports, proposals, graphs, and flowcharts;
- uses language, style, organization, and format appropriate to the subject matter, purpose, and audience;
- includes supporting documentation, and attends to level of emphasis, form, grammar, spelling, and punctuation

US Department of Labor (2000). Workplace Essential Skills. Resources Related to the SCANS Competencies and Foundation Skills

30

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Basic Skills

Arithmetic

- performs basic computations,
- uses basic numerical concepts such as whole numbers and percentages in practical situations,
- makes reasonable estimates of arithmetic results without a calculator, and
- uses tables, graphs, diagrams, and charts to obtain or convey quantitative information.

US Department of Labor (2000). Workplace Essential Skills. Resources Related to the SCANS Competencies and Foundation Skills

31

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Basic Skills

Mathematics

- approaches practical problems by choosing appropriately from a variety of mathematical techniques,
- uses quantitative data to construct logical explanations for real-world situations,
- expresses mathematical ideas and concepts orally and in writing, and
- understands the role of chance in the occurrence and prediction of events.

US Department of Labor (2000). Workplace Essential Skills. Resources Related to the SCANS Competencies and Foundation Skills

32

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Basic Skills

Listening

Receives, attends to, interprets, and responds to verbal messages and other cues such as body language in ways that are appropriate to the purpose (e.g., comprehend, learn, critically evaluate, appreciate, or support a speaker).

US Department of Labor (2000). Workplace Essential Skills. Resources Related to the SCANS Competencies and Foundation Skills

33

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Basic Skills

Speaking

- Organizes ideas and communicates oral messages appropriate to listeners and situations;
- participates in conversation, discussion, and group presentations;
- selects an appropriate medium for conveying a message;
- uses verbal language and other cues such as body language appropriate in style, tone, and level of complexity to the audience and occasion;
- speaks clearly and communicates a message;
- understands and responds to listener feedback;
- and asks questions as necessary.

US Department of Labor (2000). Workplace Essential Skills. Resources Related to the SCANS Competencies and Foundation Skills

34

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Karen M. Maduschke and Phyllis T.H Grummon (1996)

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 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.

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;

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

Karen M. Maduschke and Phyllis T.H Grummon (1996) Technical Documentation to Working. Public Policy Associates. http://www.hhpublishing.com/_assessments/WORKING/WORKINGTechMan.pdf

35

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Scales of WORKING

Assessing Skills Habits and Style

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

36

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

WORKING

Scoring

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

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.

Scores for the 16 reverse-coded (R) 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.

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.

37

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

WORKING

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.

38

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

WORKING

Taking Responsibility. Items

- 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)

39

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

WORKING

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.

40

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

WORKING

Working in Teams. Items

- 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)

41

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

WORKING

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.

42

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

WORKING

Persisting. Items

- 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.

43

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

WORKING

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.

44

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

WORKING

A Sense of Quality. Items

- 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)

45

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

WORKING

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.

46

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

WORKING

Life-Long Learning. Items

- 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.

47

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

WORKING

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.

48

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

WORKING

Adapting to Change. Items

- 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)

49

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

WORKING

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.

50

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

WORKING

Permanent Problem Solving. Items

- 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.

51

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

WORKING

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.

52

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

WORKING

Information Processing. Items

- 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.

53

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

WORKING

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.

54

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

WORKING

Systems Thinking. Items

- 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.

55

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

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

56

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

WORKING - for the Workplace use

- **In-plant readiness/improvement programs** — intensive but usually short-term in-plant training programs to hone the preparatory skills of new employees or improve/broaden the skills of existing employees
- **Apprenticeships** — extended assignments of students to perform regular duties on a daily or weekly basis in a particular job, mainly as part of their program of education
- **Orientations** — short, but often intensive, employer-led introductions of new employees to the processes, culture, regulations, organization, and expectations of a particular company
- **Employability skills development programs** —intensive training programs which provide those without significant prior work experience with the basic skills, the habits and attitudes, and the general technical skills needed to prepare for productive employment in entry-level positions
- **Pre-employment training programs** — programs which provide those with significant prior work experience or relevant education with 'brush-up' workplace skills in areas ranging from technical math and reading through safety, SPC, business economics, and the like.

Working is designed to be useful in all of these settings, and others relating to developing proficient employees. **Please note that as with any self-assessment instrument Working is not designed for direct use in employee promotion and/or selection**. It is designed to provide information about the employee (to the employee, trainers, and employers) which can be used in many ways to better-prepare that employee for successful performance on the job.

WORKING – DEEMS SUBJECT IN THE WORKPLACE http://www.hhpublishing.com/_assessments/WORKING/WORKING_WorkplaceAppMan.pdf

57

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Essential Skills
Human Resources and Skills Development Canada

"Through extensive research, the Government of Canada and other national and international agencies have identified and validated these key Essential Skills for the workplace. These skills are used in nearly every job and at different levels of complexity. They provide the foundation for learning all other skills and enable people to evolve with their jobs and adapt to workplace change."

1.Reading
2.Document Use
3.Numeracy
4.Writing
5.Oral Communication
6.Working with Others
7.Thinking
8.Digital Technology
9.Continuous Learning

http://www.skillplan.ca/essential-skills#reading

58

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Essential Skills
Human Resources and Skills Development Canada

1. **Reading** is understanding information in the form of sentences or paragraphs. Workplace examples: reading instructions from an equipment manual, reading flight information on a computer screen.
2. **Document Use** is reading signs, labels, lists, or drawings; interpreting information on graphs; and entering information on forms. Workplace examples: interpreting building height information from a blueprint, getting price information from a product catalogue.
3. **Numeracy** is using numbers and thinking in quantitative terms to complete tasks, such as estimating amounts, scheduling, or analyzing data. Workplace examples: calculating the amount of change to give to a customer, preparing budgets for the company.
4. **Writing** is conveying ideas by writing text and writing in documents, such as filling in forms or typing on a computer. Workplace examples: filling out a form to request equipment repairs, writing an annual report about the company's activities for the previous year.

59

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Essential Skills
Human Resources and Skills Development Canada

5. **Oral Communication** is using speech to give and exchange thoughts and information. Workplace examples: informing a customer about a company's services, making a presentation at an office meeting.
6. **Working with Others** is working with co-workers, as a member of a team, or in a supervisory position. Workplace examples: coordinating tasks with co-workers to cater a banquet, working as an assistant to help a supervisor complete a task.
7. **Thinking** is evaluating ideas or information to reach a rational decision. Workplace examples: making a diagnosis about a patient's condition based on observations and the patient's medical reports, resolving a customer complaint.
8. **Digital Technology** is using computer applications or technical tools such as word processing, e-mails, or spreadsheets. Workplace examples: using a spreadsheet to make budget calculations for a project, completing financial transactions using electronic cash registers.
9. **Continuous Learning** is ongoing learning as part of work, through on or off site training, or from co-workers. Workplace examples: receiving on-the-job mentoring about a new company procedure, attending a convention to learn about new products.

60

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Canadian Tests of Basic Skills (CTBS) Forms K and L Overview

CURRICULUM AREA	Grade / Level	PRIMARY FORM K	ELEMENTARY FORM K	ELEMENTARY FORM L (SURVEY)	HIGH SCHOOL FORM K
	Grade	K.1–1.5 K.8–1.9 1.7–2.6 2.5–3.5	3 4 5 6 7 8	3 4 5 6 7 8	9 10 11–12
	Level	5 6 7 8	9 10 11 12 13 14	9 10 11 12 13 14	15 16 17/18
VOCABULARY		Vocabulary	Vocabulary (15)	Vocabulary (7)	Vocabulary (15)
READING		Word Analysis / Reading	Reading Comprehension (40)	Comprehension (23)	Reading Comprehension (40)
LANGUAGE		Listening			
		Language	Spelling (12)	Integrated Language (40)	Correctness and Appropriateness of Expression (40)
			Capitalization (12)		
			Punctuation (12)		
			Usage and Expression (24)		
SOURCES OF INFORMATION		Sources of Information	Reference Materials (25)		Use of Sources of Information (20)
MATHEMATICS		Mathematics: Math Concepts	Math Concepts and Estimation (30)	Concepts (10) / Estimation (5)	Ability to Do Quantitative Thinking (40)
		Math Problems	Math Problem Solving and Data Interpretation (30)	Problem Solving (9) / Data Interpretation (6)	
		Math Computation	Math Computation (20)		
SCIENCE		Science	Science (30)		Analysis of Science Materials (40)
MAPS AND DIAGRAMS			Maps and Diagrams (30)		
TOTAL WORKING TIME		2h 29/43min 45/54min 49/120min	280 min	100 min	195 min

NOTE: Numbers in brackets are working times in minutes for levels 9 to 17/18. Out-of-level testing is described in the Teacher's Handbook.

61

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

BASIC MATHEMATICS

Solve the following problems:

1. Write this number in words 157802
2. Round 36,993 to the nearest thousands
3. Round 6.724 to the nearest hundredth
4. 324 times 87
5. 81.32 times 0.3214
6. Divide 89 into 4356
7. Find the greatest common factor of 24 and 76
8. Find the least common factor of 12 and and 36
9. Circle the numbers that are prime.

   2 5 8 13 17 18 21 93 117

10. Tell if the fraction on the left is less or greater than the fraction on the right. Use < or >

$\frac{2}{3}$ $\frac{3}{5}$ $\frac{6}{15}$ $\frac{3}{7}$

62

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

BASIC COMPUTER SKILLS TEST (BCST)

The BCST is an assessment of knowledge and skills relating to basic computer and Internet usage. The test contains 15 multiple choice questions designed to assess specific job-related knowledge and skills in two areas: Basic Computer/Windows and Intranet/Internet/Browser/Email. The purpose of these questions is to evaluate your readiness to perform a job that requires use of a computer.

During the test you will be asked questions about a variety of basic computer and internet skills, including:

- Basic parts of a computer, use of Windows software, basic computer functions (using a mouse, working in multiple Windows, etc.) and basic software functions (saving a file, copying text, etc.)
- Basic Internet, browser and email functions (finding websites, searching for information and sending email, etc.)

The BCST process takes approximately 15 minutes. The test contains questions like the following:

1. In order to search for information on the Internet, you would open the following program:
   a. Email
   b. Browser
   c. Hard Drive
   d. Spreadsheet

http://att.jobs/docs/test-guides/basic-computer-skills-test-%28BCST%29.pdf

63

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Question Excerpt From Basic Computer Skills Assessment

Q.1) How do you open a program such as a Microsoft Word when there are no icons on the desktop?

A. Right click to reveal all icons.
B. Restart the computer.
C. It is not possible to open program if no icons are on the desktop.
D. Cick the start button and select program from the menu.

Q.2) How do you minimize or maximize a program in Windows?

A. Right click on the mouse.
B. Go to "File" and select minimize or maximize.
C. Top right corner, dash or square.
D. This function can not be done.

http://www.proprofs.com/quiz-school/story.php?title=basic-computer-skills-assessment

64

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Question Excerpt From Basic Computer Skills Assessment

Q.3) How do you close a window on your desktop?

A. Go to "File" and select "Close".
B. Press the "Ctrl" key on the keyboard.
C. Use the mouse to press the button with the "X" in it at the top right corner of the screen.
D. Use the mouse to press the button with the _ in it at the top right corner of the screen.

Q.4) A word processing file can be attached to an e-mail message?

A. Yes
B. No
C. Depends on what type of file.
D. Only to select email addresses.

http://www.proprofs.com/quiz-school/story.php?title=basic-computer-skills-assessment

65

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Question Excerpt From Basic Computer Skills Assessment

Q.5) What does the "Reply to All" e-mail function do?

A. It will generate a reply message to all of the recipients of the message.
B. It will send a reply message to every entry in your address book.
C. It will generate a reply message only to the sender of the message.
D. This function is not possible.

Q.6) Which of the following is an example of an e-mail address?

A. www.google.com
B. jeandoe.gmail.com
C. Bob Smith@yahoo.com
D. johndoe@cincinnatilibrary.org

http://www.proprofs.com/quiz-school/story.php?title=basic-computer-skills-assessment

66

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Question Excerpt From Basic Computer Skills Assessment

Q.7) Which two websites offer free email service?

A. Yahoo and Amazon
B. Yahoo and Google
C. I-Tunes and Twitter
D. Library website and Hotmail

Q.8) "Desktop" is a computer term that refers to?

A. Something that is for the computer programmer only.
B. The part of your work area where the computer monitor sits.
C. The initial screen showing icons for folders, applications and files.
D. The desk that your computer is stationed on.

http://www.proprofs.com/quiz-school/story.php?title=basic-computer-skills-assessment

67

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Euridice competences

Eight key competences have been defined at EU level, which represent a combination of knowledge, skills and attitudes that are considered necessary for personal fulfilment and development; active citizenship; social inclusion; and employment:

- communication in the mother tongue;
- communication in foreign languages;
- mathematical competence and basic competences in science and technology;
- digital competence
- learning to learn;
- social and civic competences;
- sense of initiative and entrepreneurship
- cultural awareness and expression.

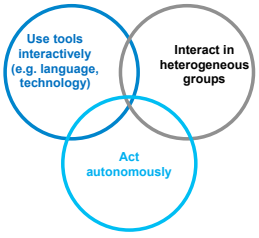
Further support needed for the development of transversal competences

Eurydice (2012) Developing Key Competences at School in Europe: Challenges and Opportunities for Policy.
http://eacea.ec.europa.eu/education/eurydice/documents/thematic_reports/145EN.pdf

68

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Organization for Economic Cooperation and Development
Key Competencies in Three Broad Categories



- First, individuals need to be able to use a wide range of tools for interacting effectively with the environment: both physical ones such as information technology and socio-cultural ones such as the use of language. They need to understand such tools well enough to adapt them for their own purposes – to use tools interactively.
- Second, in an increasingly interdependent world, individuals need to be able to engage with others, and since they will encounter people from a range of backgrounds, it is important that they are able to interact in heterogeneous groups.
- Third, individuals need to be able to take responsibility for managing their own lives, situate their lives in the broader social context and act autonomously.

Organization for Economic Cooperation and Development (2005). Definition and selection of key competencies: Executive summary. http://www.oecd.org/dataoecd/47/61/35070367.pdf

69

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

PISA Surveys

PISA tests 15-year-old students in reading, mathematics and science as well as measuring a wider range of factors including students' interest, attitudes and motivation. The assessment focuses on young people's ability to use their knowledge and skills to meet real-life challenges, rather than merely on the extent to which they have mastered a specific school curriculum. This approach is called 'literacy'.

70

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

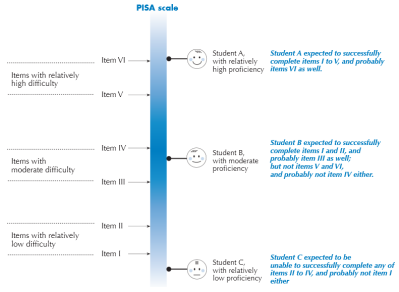
PISA literacy

- **Reading literacy** - understanding, using and reflecting on written texts, in order to achieve one's goals, to develop one's knowledge and potential, and to participate in society.
- **Mathematics** is defined in relation to three dimensions: the content, the mathematical processes and the situations.
- **Scientific literacy** - the capacity to use scientific knowledge, to identify questions and to draw evidence-based conclusions in order to understand and help make decisions about the natural world and the changes made to it through human activity.

71

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Relationship between items and students on a proficiency scale



OECD (2009) TAKE THE TEST: SAMPLE QUESTIONS FROM OECD'S PISA ASSESSMENTS
http://www.oecd.org/pisa/pisaproducts/pisa2006/41943106.pdf

72

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

OECD
BETTER POLICIES FOR BETTER LIVES

OECD Programme for International Student Assessment (PISA)

- About PISA
- PISA products
  - PISA 2000
  - PISA 2003
  - PISA 2006
  - PISA 2009
- Participating countries/economies
- PISA in Focus
- PISA FAQ
- PISA en français
- PISA en español
- PISA auf Deutsch
- How to join PISA
- PISA Fellowships and Grants
- PISA-Based Test for Schools
- Contacts

PISA › PISA products › PISA 2000

Select from the following document categories:

- Publications
- Database
- Reports produced by participating countries
- Test questions
- Manuals: Sources and Methods
- Further reading

http://www.oecd.org/pisa/pisaproducts/pisa2000/

73

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY

Recommendations for further reading

- US Department of Labor (1993). Teaching the SCANS Competencies. http://wdr.doleta.gov/research/FullText_Documents/93-teaching_scans.pdf
- US Department of Labor (1999). Skills and Tasks for Jobs. A SCANS Report for America 2000. http://wdr.doleta.gov/research/FullText_Documents/1999_35.pdf
- US Department of Labor (2000). Workplace Essential Skills. Resources Related to the SCANS Competencies and Foundation Skills. http://wdr.doleta.gov/research/FullText_Documents/00-wes.pdf
- Directorate-General for Education and Culture (2002). Key Competencies. http://bookshop.europa.eu/en/key-competencies-pbEC3212295/
- European Centre for the Development of Vocational Training (2002). Transformation of learning in education and training. Key qualifications revisited. http://bookshop.europa.eu/en/transformation-of-learning-in-education-and-training-pbTI4302284/
- European Commission/EACEA/Eurydice, (2012). Developing Key Competences at School in Europe: Challenges and Opportunities for Policy. http://eacea.ec.europa.eu/education/eurydice/documents/thematic_reports/145EN.pdf
- Programme for Employment and Social Solidarity (2011). Transferability of skills across economic sectors: Role and importance for employment at European level. http://bookshop.europa.eu/en/transferability-of-skills-across-economic-sectors-pbKE3211836/
- American Management Association (AMA) 2010 Critical Skills Survey. http://www.amanet.org/training/articles/3727.aspx
- Stein (2000). Equipped for the Future Content Standards - What Adults Need to Know and Be Able to Do in the 21st Century. http://eff.cls.utk.edu/PDF/standards_guide.pdf
- OECD (2009) TAKE THE TEST: SAMPLE QUESTIONS FROM OECD'S PISA ASSESSMENTS http://www.oecd.org/pisa/pisaproducts/pisa2006/41943106.pdf

74

TALLINN UNIVERSITY OF TECHNOLOGY

Thank You!

mare@pekonsult.ee
mart.murdvee@pekonsult.ee