

Admission Policies and Practices in Era of Mass Higher Education

Michal Beller

Director-General of RAMA

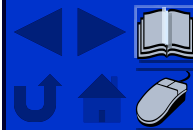
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13th SweSAT Conference

UMEA June 2010



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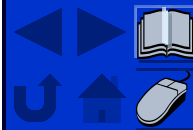
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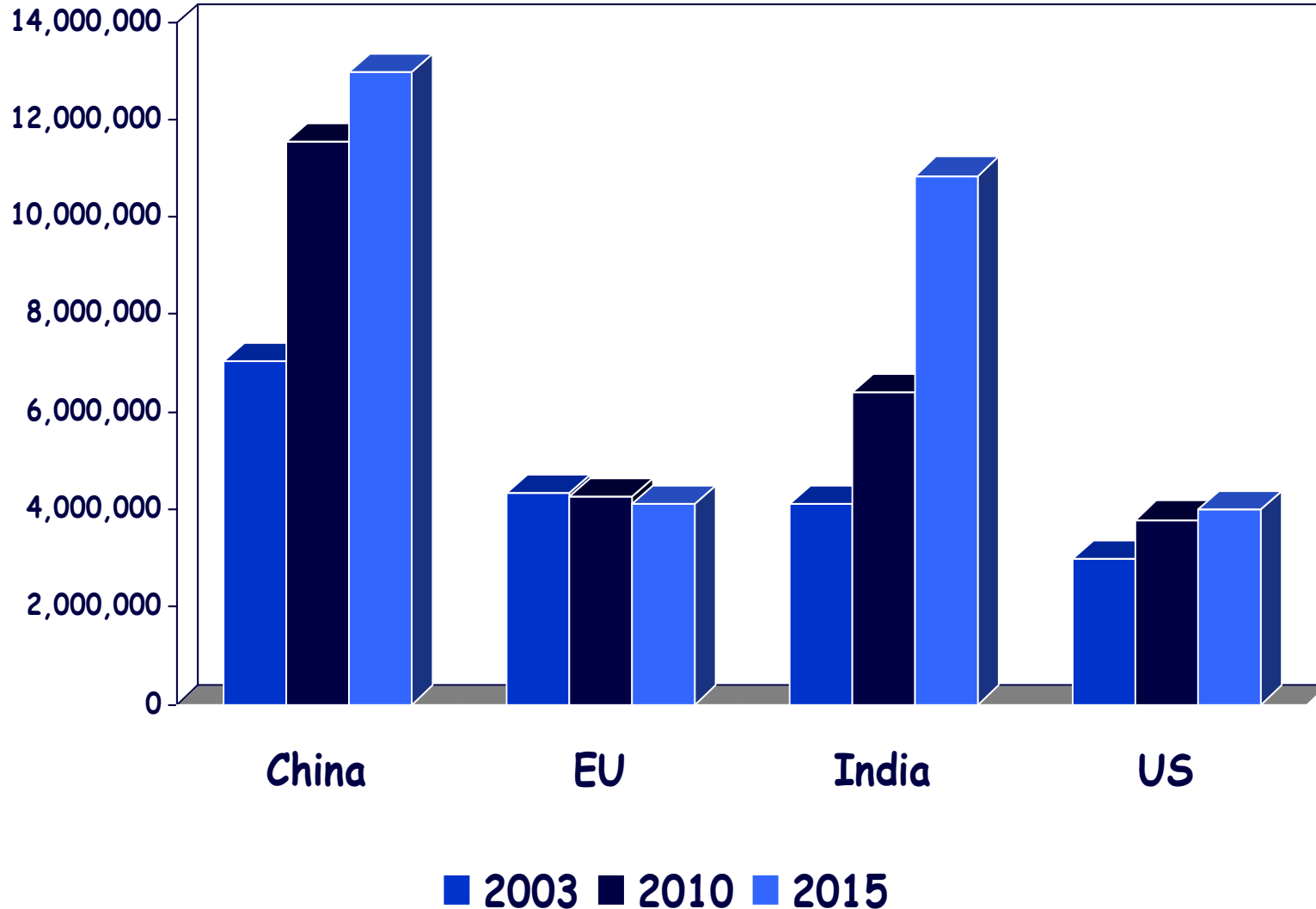
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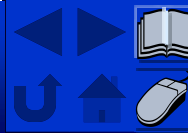
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Future Supply of High School Graduates Moving Targets



Andreas Schleicher



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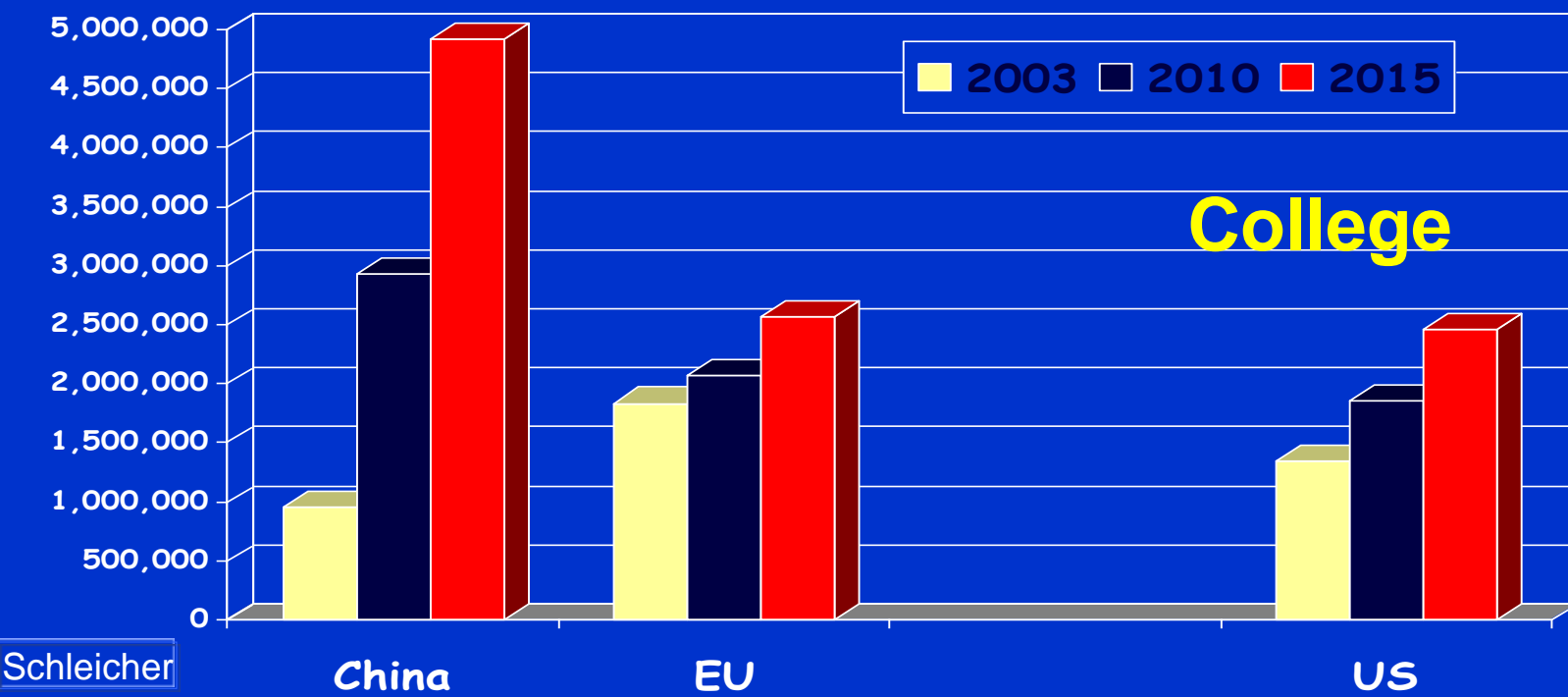
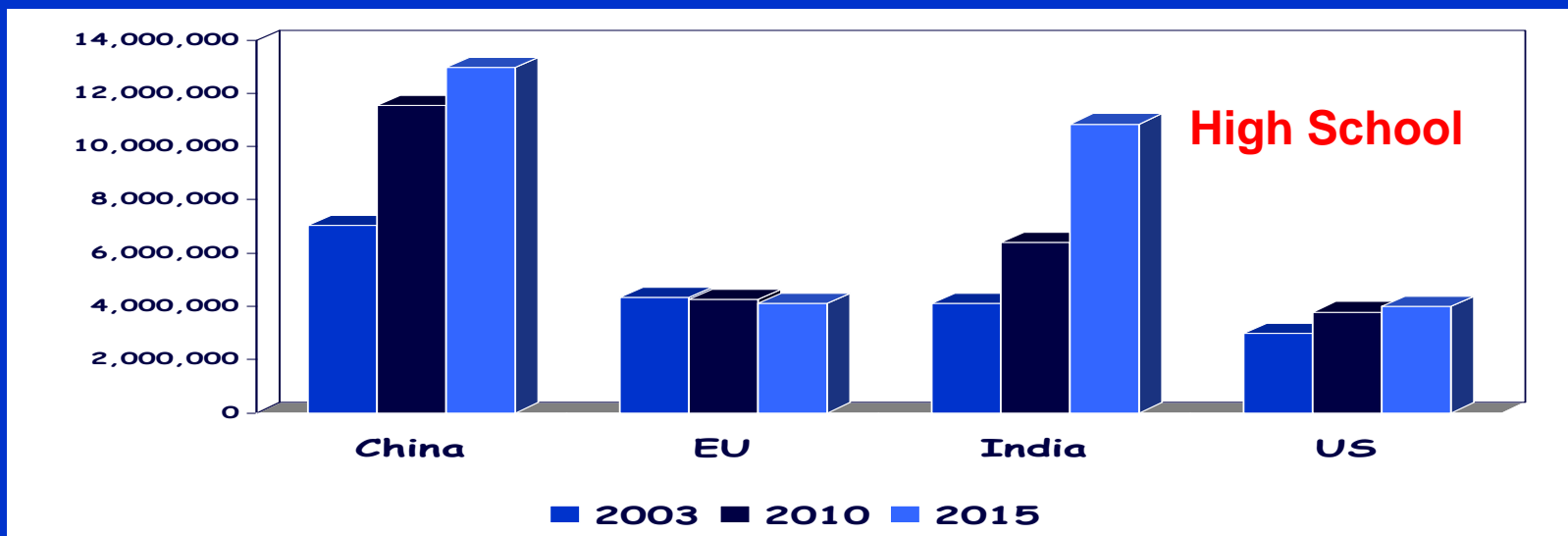
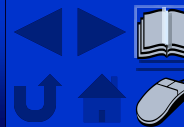
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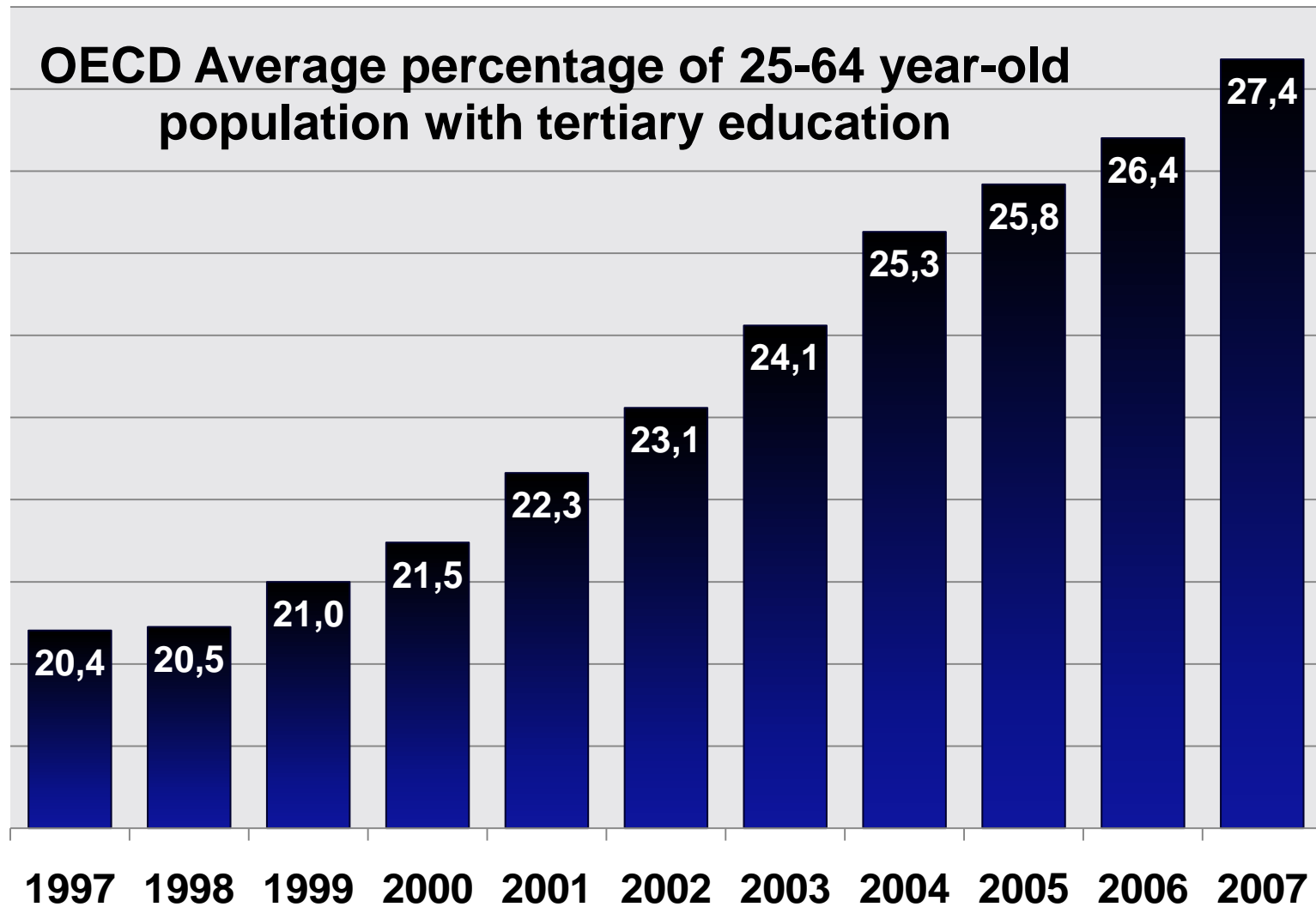
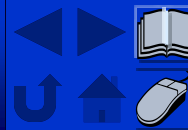
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Future Supply of College & High School Graduates



Tertiary Education: More Prevalent



Source: OECD, Education at a Glance 2009

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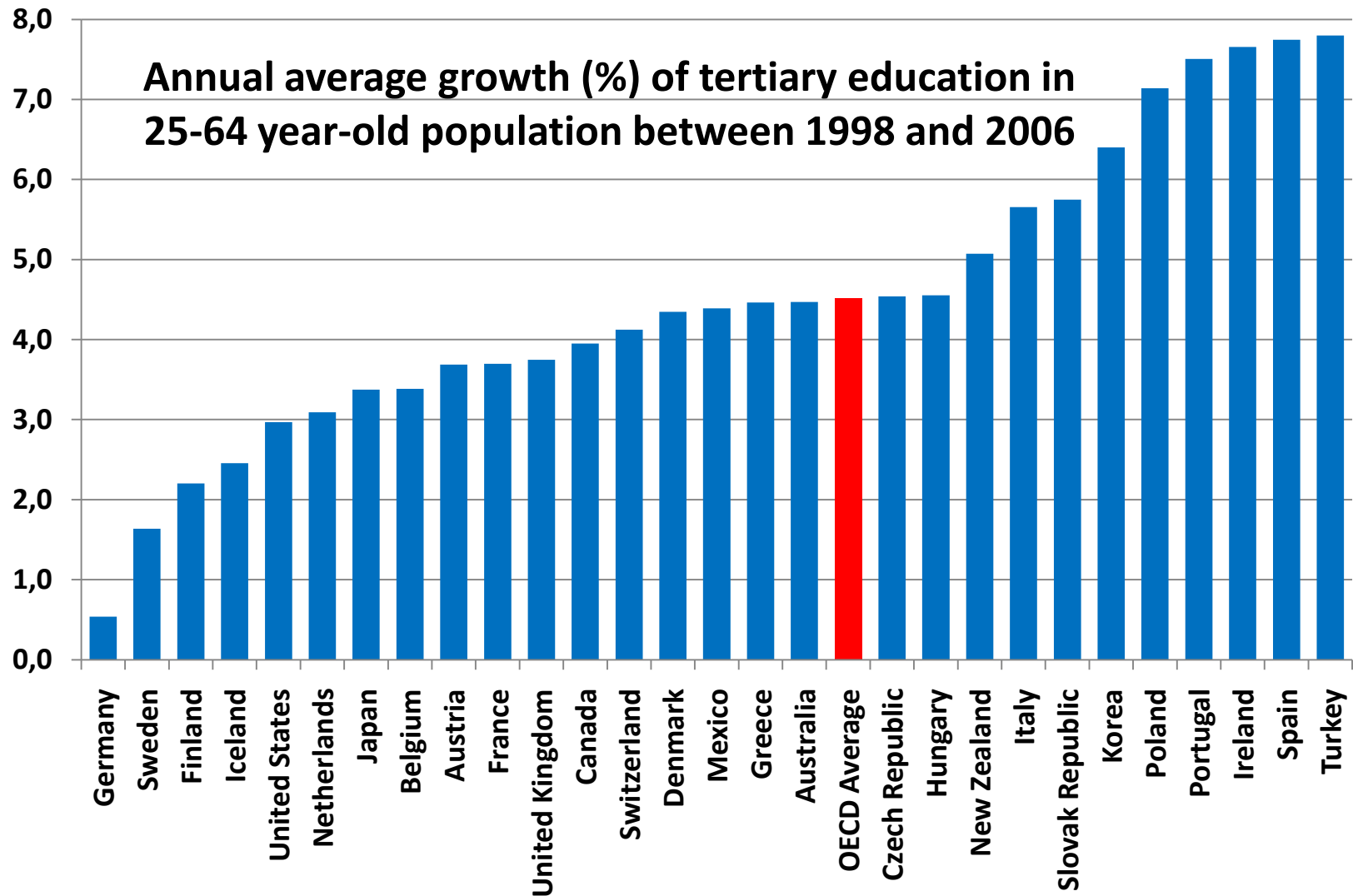
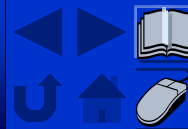
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Closing Gaps in Tertiary Education



Source: OECD, Education at a Glance 2009

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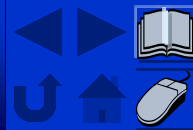
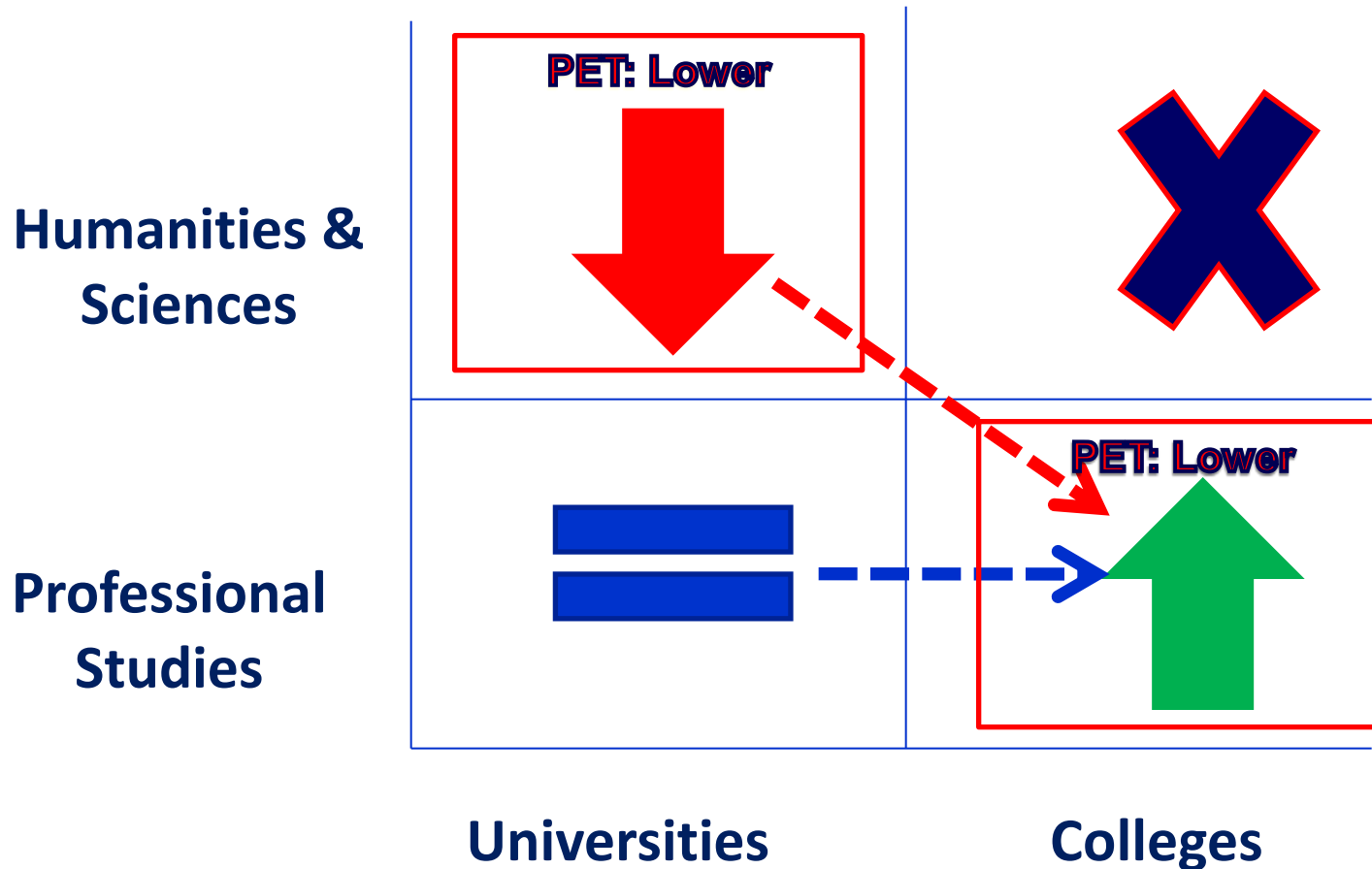
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Diversifying HE in Israel



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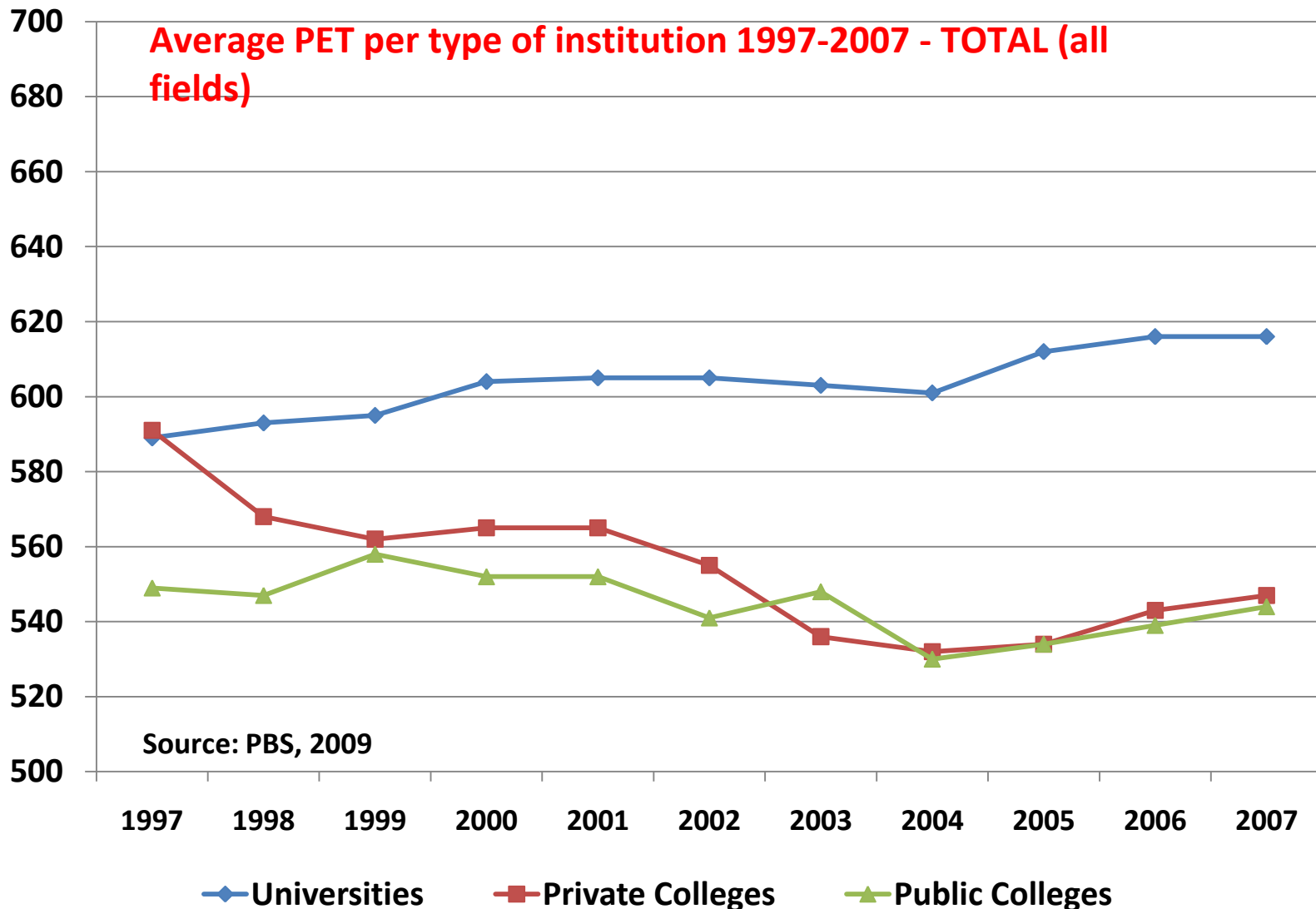
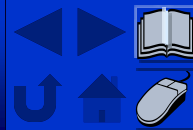
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PET Scores: Trend for all Areas of Study



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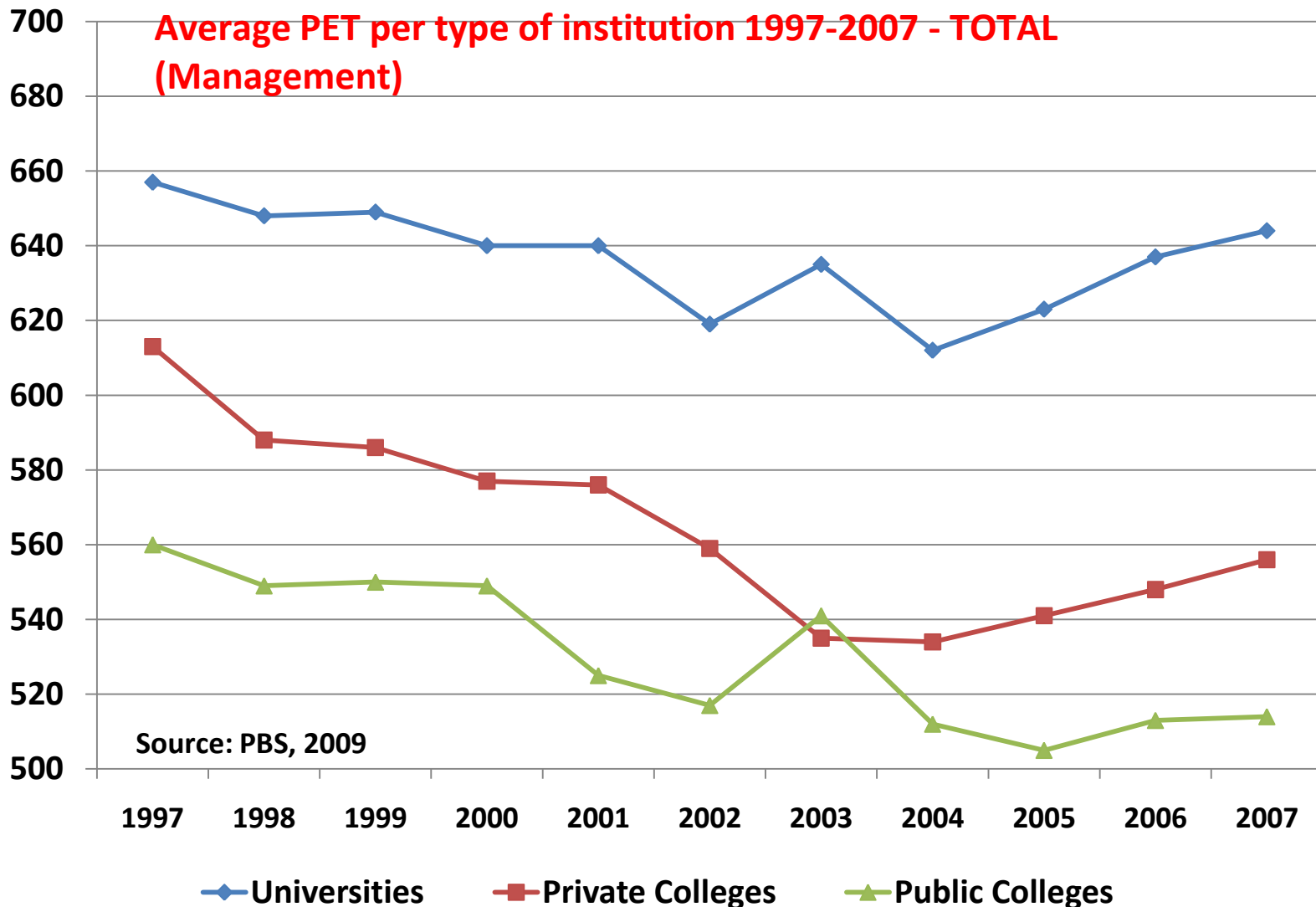
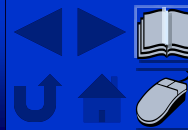
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PET Scores: Trend for Management



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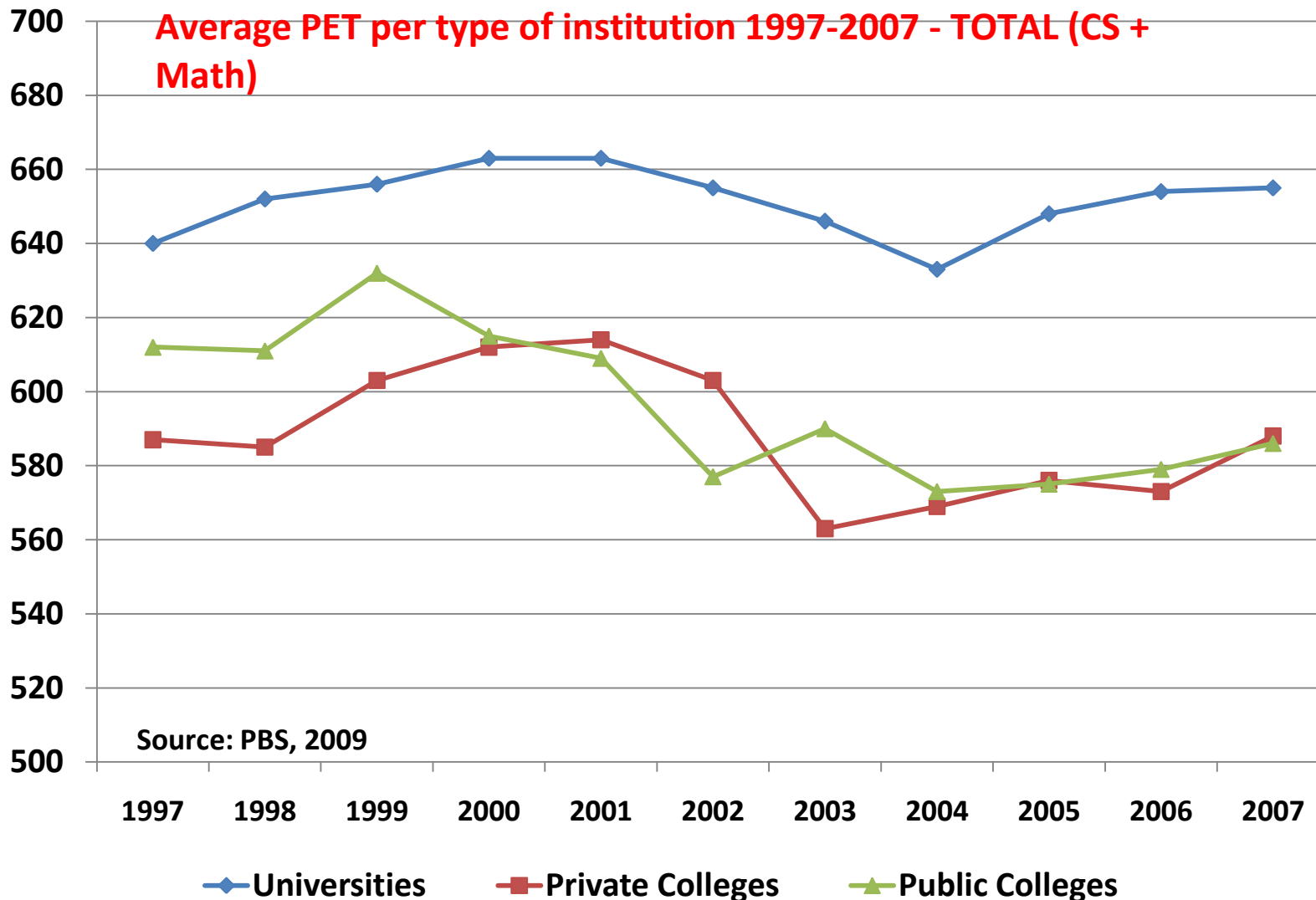
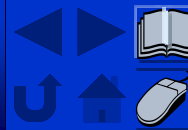
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PET Scores: Trend for CS + Math



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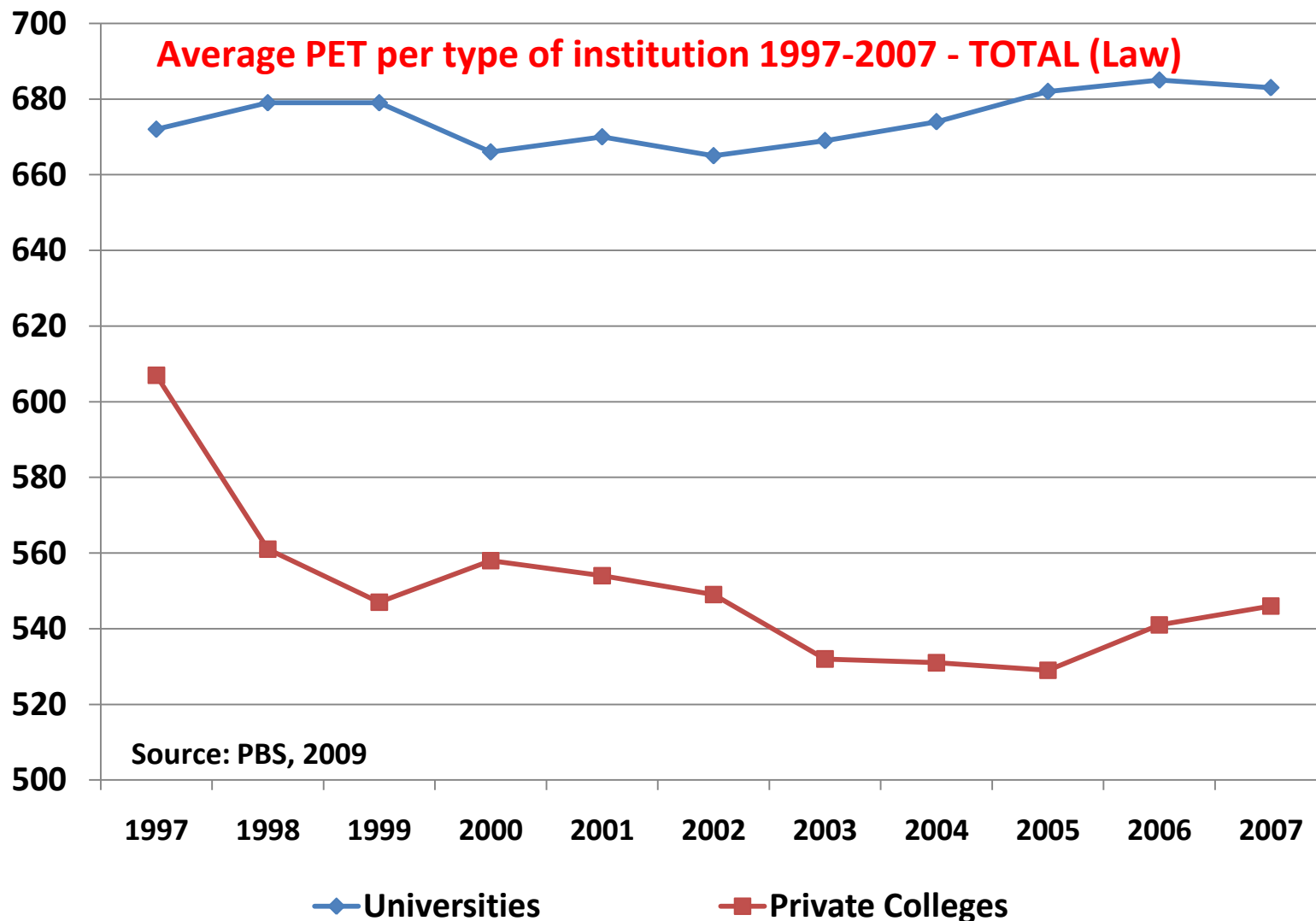
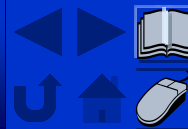
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PET Scores: Trend for Law



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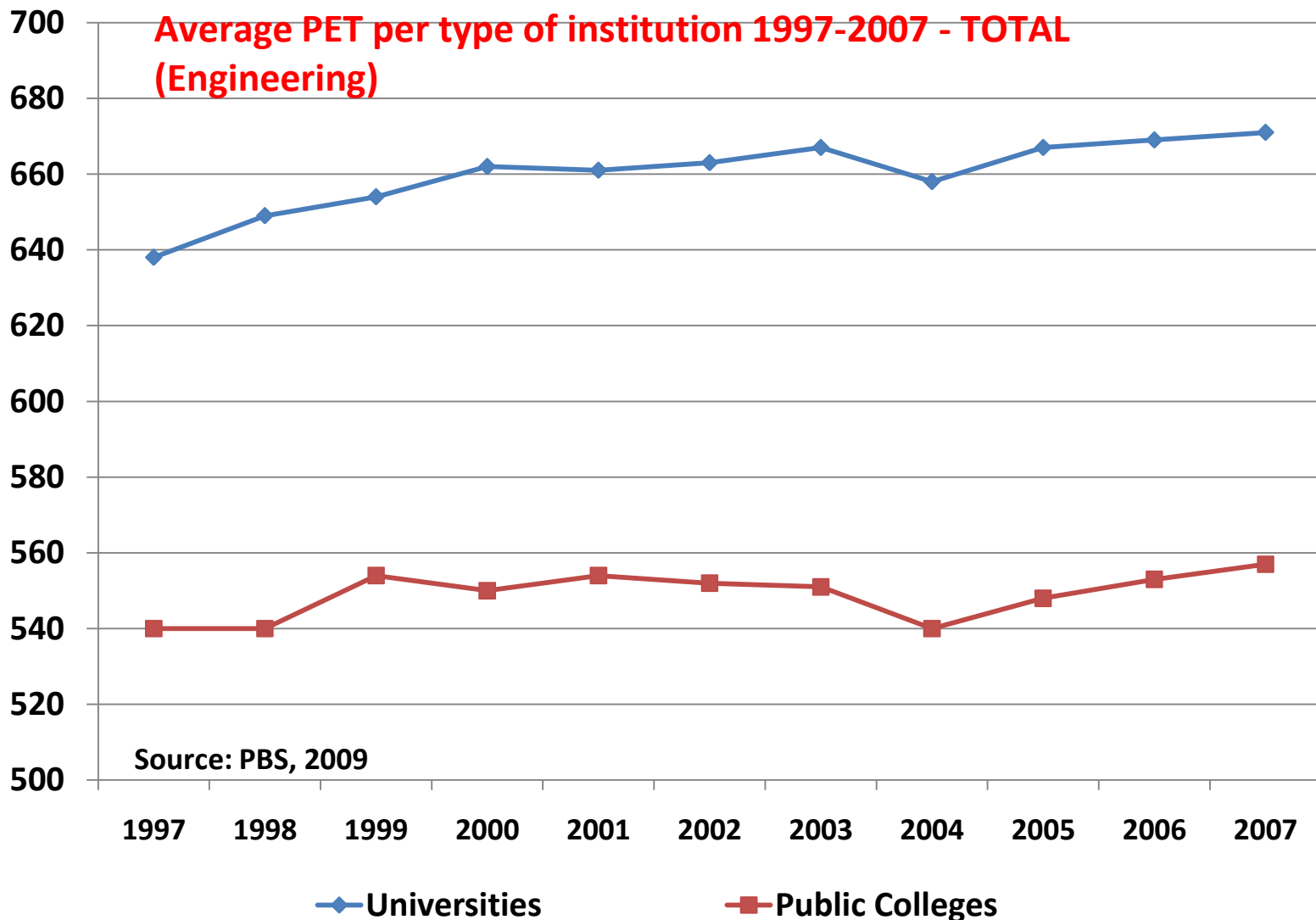
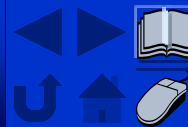
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PET Scores: Trend for Engineering



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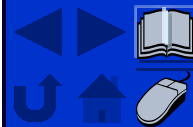
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Admissions Policy



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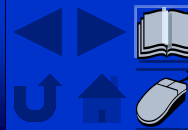
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Distributing Rare Resources When Demand Exceeds Supply

- Free market
- Equal probability (e.g., lottery)
- Ranking by seniority (e.g., waiting time)
- Meritocratic approach

Dilemma:

Meritocratic vs. Egalitarian approaches



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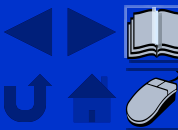
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Rich Students Will Get More College Acceptance Letters in 2010

By [Kim Clark](#)

Posted January 15, 2010

- ***College applicants in 2010 will get a lesson in the real-world version of the golden rule: the one in which **the person with the gold gets to rule*****
- ***Admissions officers and counselors say that hundreds of colleges are so desperate for cash this year that they will be **reserving more spots for students who can afford to pay full tuition and don't need financial aid*****



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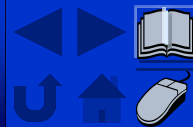
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Merit Approach - why?

It is important **who** gets
“admitted on the merit” because:

- Admission to selective schools **pays off** handsomely for **individuals** of **all** races and **backgrounds**
- Substantial **benefits** accrue **to society** at large through the leadership and civic participation of **successful graduates**

Bowen and Bok (1998). *The Shape of the River.*



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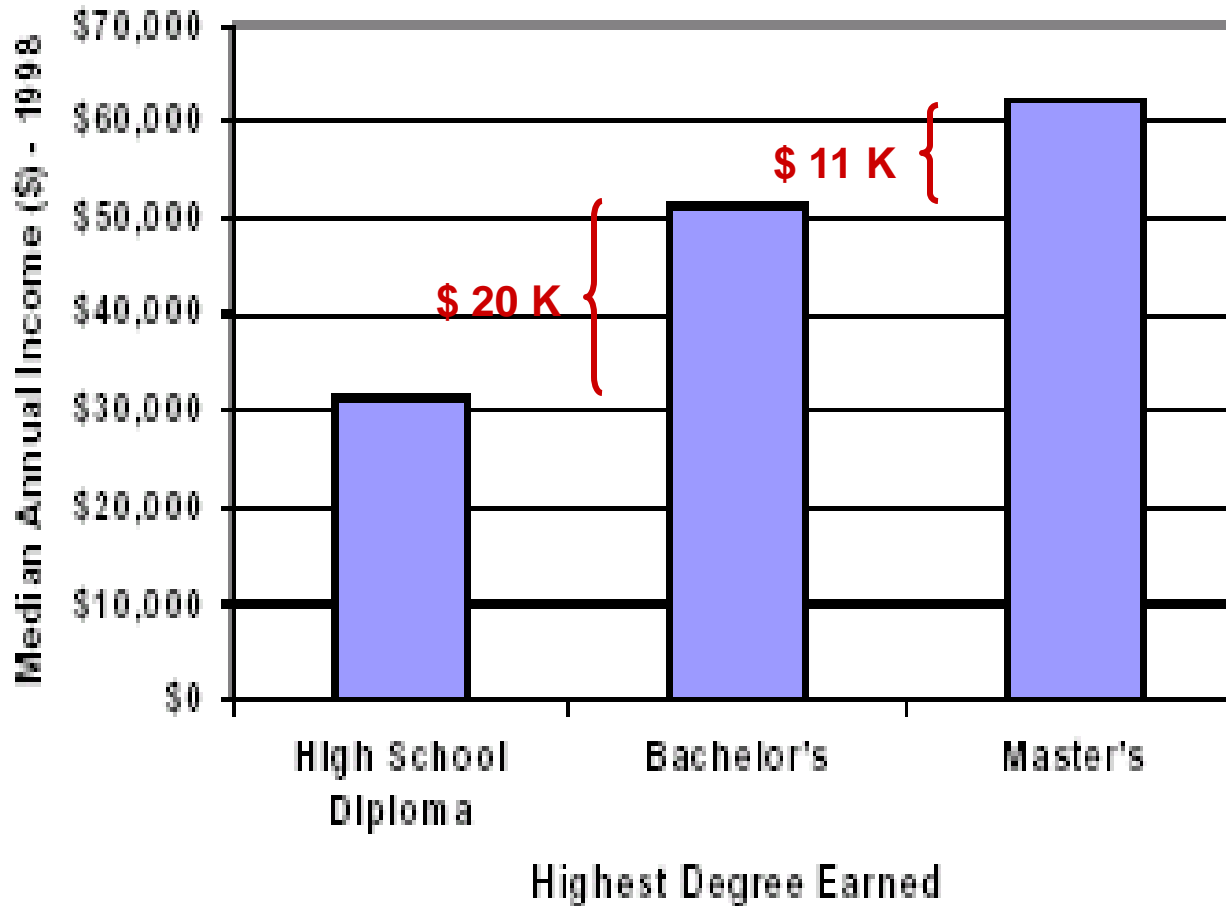
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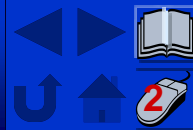
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P2 Education Income Premium



Source: U.S. Department of Education, National Center for Education Statistics



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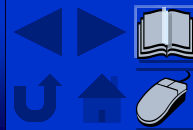
Selection Models to HE

■ No quota:

- Open admission
- Setting qualitative minimal cutoff points

■ A preset quota:

- equal probability - lottery
- setting quantitative cutoff points
 - during studies
 - pre studies



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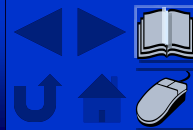
Options for Assessing Merit

Option one: formal academic achievement or equivalent

Option two: existing evidence of skills and criteria linked to success on HE courses

Option three: additional assessment

- Structured interviews;
- Auditions;
- Demonstrations of practical or vocational skills;
- Written work;
- Generic or subject-specific tests of aptitude;
- Generic or subject-specific tests of critical reasoning



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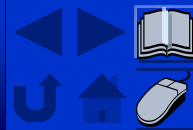


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International Scope

- **Netherlands** - weighted lottery (on GPA)
- **Germany** –
 - distribution (order the institutions by choice),
 - general selection (GPA, waiting time),
 - special selection (recently abolished)
- **UK** - A level grades (+ new reform)
- **France** - GPA + Concourse
- **Australia-Queensland** - Core Skills Test
- **Sweden** - GPA or SweSAT
- **Israel** – GPA + PET
- **USA** - HSR + SAT/ACT + AP + other...



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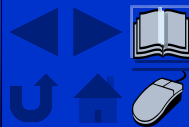


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Test Bias

- **Bias** - systematic errors in the predictive validity or construct validity associated with an examinee's group membership
- **Detection of test-bias** - usually carried out by applying methods that follow from the definitions given by Darlington (1971) and Linn (1984)



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Admissions system that is both fair and seen to be fair

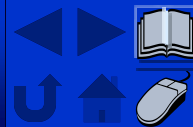
Principle 1: A fair admissions system should be transparent

Principle 2: A fair admissions system should enable institutions to select students who are able to complete the course as judged by their achievements and their potential

Principle 3: A fair admissions system should strive to use assessment methods that are reliable and valid

Principle 4: A fair admissions system should seek to minimize barriers for applicants

Principle 5: A fair admissions system should be professional in every respect and underpinned by appropriate institutional structures and processes



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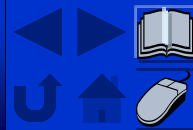
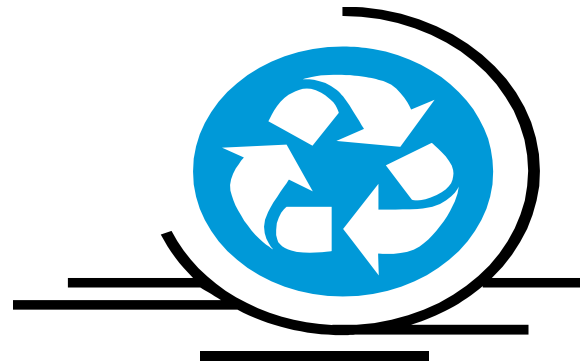
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Reverse Discrimination

It is impossible to affirmatively affect the probability of allowing members of target groups to be selected ...

...without affecting the probability that individual members outside the groups will not be selected



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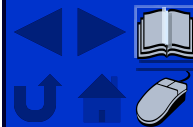
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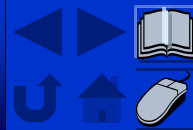
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New SAT - Writing



Improving Sentences

Tests your ability to correct faults in usage and sentence structure, and recognize effective sentences that follow the conventions of Standard Written English.

Identifying sentence errors

Tests your ability to recognize faults in usage, and recognize effective sentences that follow the conventions of Standard Written English.

Improving Paragraphs

Tests your ability to revise sentences in the context of a paragraph or the entire essay, organize and develop paragraphs in a coherent and logical manner, and apply the conventions of Standard Written English.

Essay The SAT®

You'll be asked to present and support a point of view on a specific issue. Because you have only 25 minutes, your essay is not expected to be polished - it is meant to be a first draft.

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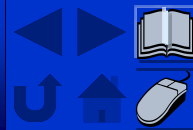
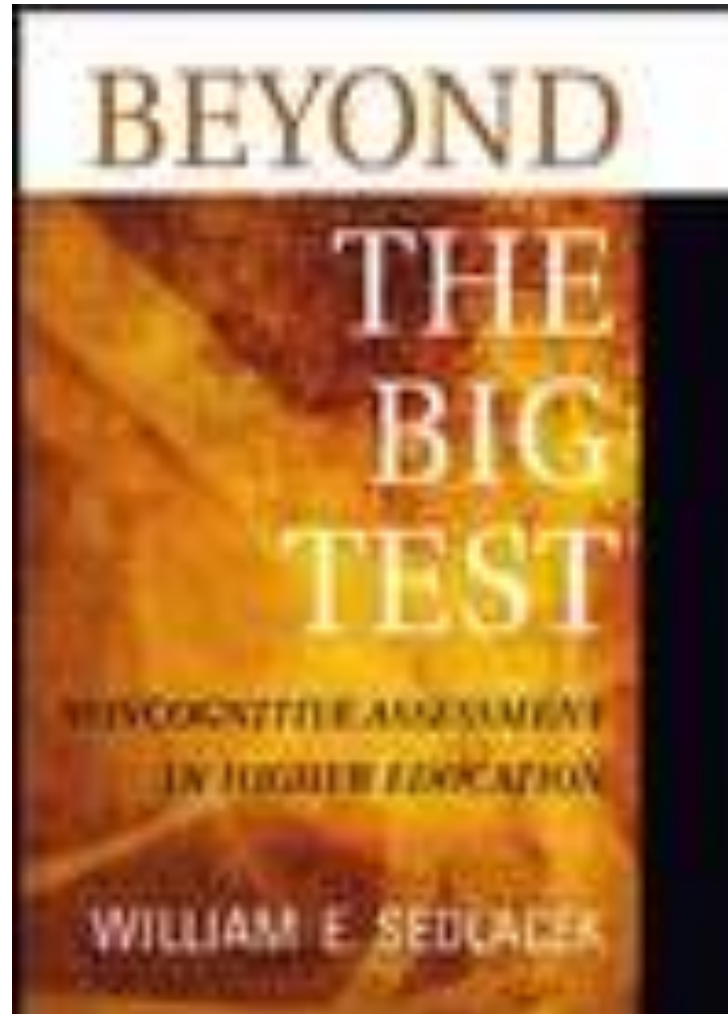


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Beyond The Big Test

Non cognitive assessment in higher education



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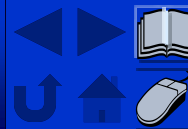
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Noncognitive Variables Relevant for Admissions

The Noncognitive Questionnaire (NCQ) was designed to assess 8 noncognitive variables (Sedlacek, 1996) :

1. Positive Self-Concept
2. Realistic Self-Appraisal
3. Understands and Knows How to Handle Racism
4. Prefers Long-Range to Short-Term or Immediate Needs
5. Availability of Strong Support Person
6. Successful Leadership Experience
7. Demonstrated Community Service
8. Knowledge Acquired in or about a Field

Inter-rater reliability on scores from the three open-ended NCQ items ranged from **.73 to 1.00.**



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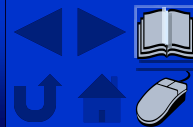


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OSU Application

- Oregon State University (OSU) has developed a selection system based on the 8 noncognitive variables
- Raters from many parts of the campus are trained to score the questions. **Inter-judge agreement was estimated at .85**
- OSU uses its system in **selection, academic advising, student services, on and off campus referrals, financial aid, and teaching.**
- OSU noncognitive scores **correlate with retention**, and since employing noncognitive variables the OSU retention rate is higher, there is **more diversity in the applicant pool and first year class**, campus offices are working better together, applicant GPA is up, referrals are better, and new courses and student services have begun based on the noncognitive information



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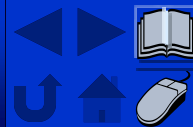
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ETS offers a variety of assessment tools graduate schools can use to determine if applicants have the skill sets and personal attributes needed to succeed.

The ETS® Personal Potential Index (ETS® PPI)

- *Get reliable information on six critical attributes of applicants that graduate and business school deans and faculty have identified as essential for successful graduate study.*



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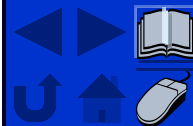
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The ETS® Personal Potential Index (ETS® PPI)

- ETS PPI is a web-based system for evaluating six key personal attributes that graduate deans and faculty have identified as essential for graduate study
- Evaluators provide an overall evaluation and rate applicants on the following:
 1. Knowledge and Creativity
 2. Communication Skills
 3. Teamwork
 4. Resilience
 5. Planning and Organization
 6. Ethics and Integrity

<http://www.ets.org/Media/Products/PPI/flashTour/ETSPPI.html>



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Listening. Learning. Leading.®

ETS® Personal Potential Index

Sign Out | My ETS® PPI Home | Help | Contact
ETS PPI Evaluator: Anne Barnes

- 1. Select Applicant
- 2. Evaluate Applicant
- 3. Review Evaluation
- 4. Evaluation Complete

- Relationship to Applicant
- Knowledge and Creativity
- Communication Skills
- Teamwork
- Resilience**
- Planning and Organization
- Ethics and Integrity
- Overall Evaluation
- Self-Evaluation

Resilience

Applicant: **Patricia S. King**

Please rate the applicant relative to others in your department or unit who have gone on to graduate or professional study. "Insufficient Opportunity to Evaluate" responses are excluded from the ETS® PPI Evaluation Report.

Accepts feedback without getting defensive

- Below Average
- Average
- Above Average
- Outstanding (top 5%)
- Truly Exceptional (top 1%)
- Insufficient Opportunity to Evaluate

Works well under stress

- Below Average
- Average
- Above Average
- Outstanding (top 5%)
- Truly Exceptional (top 1%)
- Insufficient Opportunity to Evaluate

Can overcome challenges and setbacks

- Below Average
- Average
- Above Average
- Outstanding (top 5%)
- Truly Exceptional (top 1%)
- Insufficient Opportunity to Evaluate

Works extremely hard

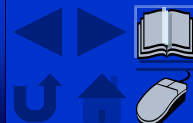
- Below Average
- Average
- Above Average
- Outstanding (top 5%)
- Truly Exceptional (top 1%)
- Insufficient Opportunity to Evaluate

Add examples and general comments on Resilience, if appropriate, by typing or pasting unformatted text into the text box. (1,000 character maximum; approximately 150-200 words)

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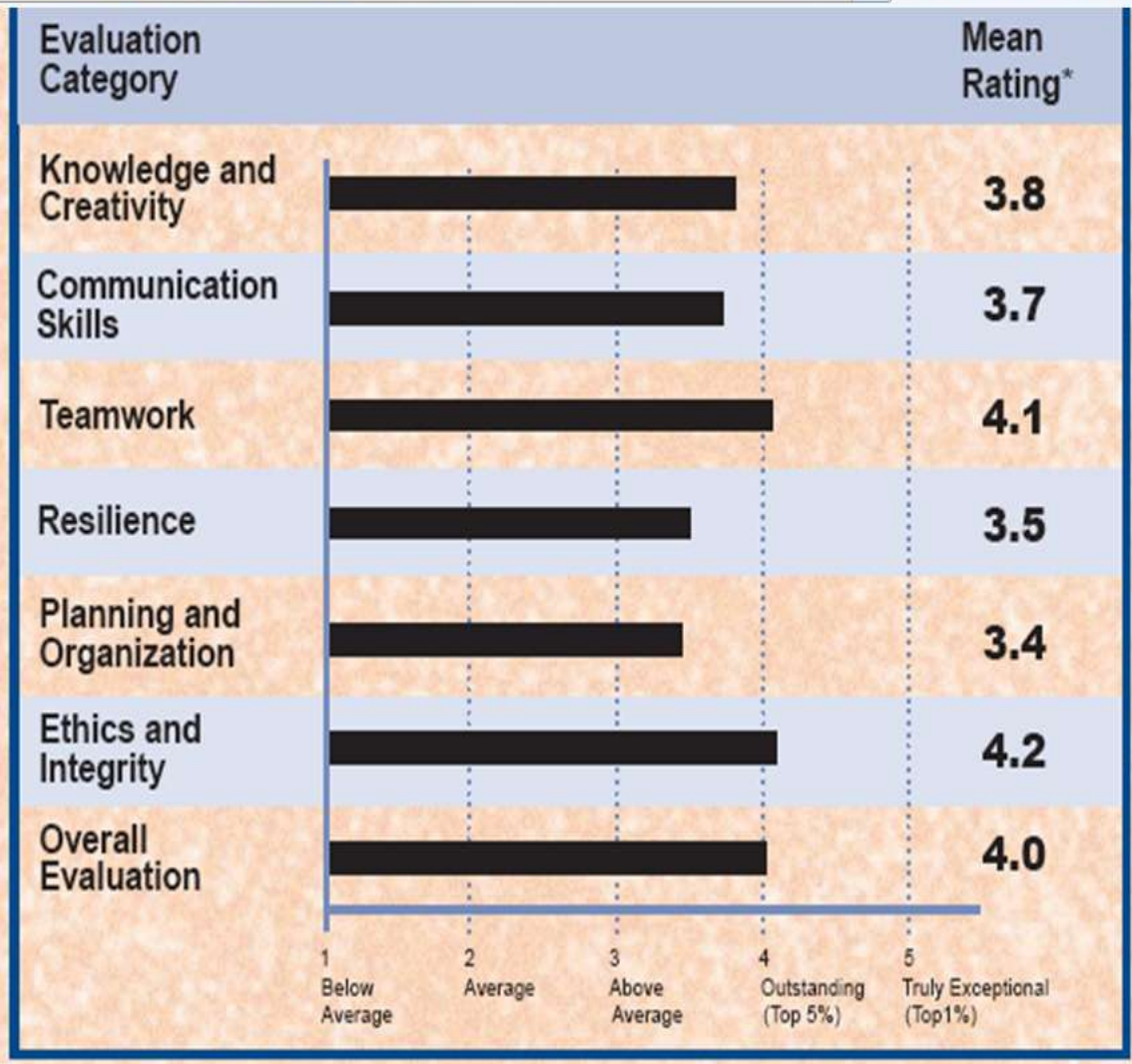
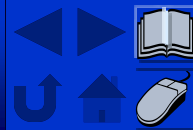
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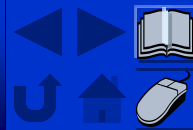




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A Fuller Picture of Graduate-School Applicants' Potential for Success



Patrick Kyllonen
*directs the
Center for New Constructs i
ETS's Research &
Development
Division.*

Conceptually, the ETS PPI grows out of longstanding interest of ETS and the GRE

Board in students' personal attributes, sometimes called noncognitive skills.

Psychometrically, it is an outgrowth of ETS scientists' groundbreaking work in measuring these skills and their role in academic performance.

Beginning in July 2009, ETS is making the ETS® Personal Potential Index (ETS® PPI) available to prospective graduate school applicants along with GRE.

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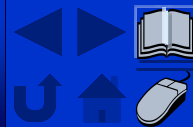


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PPI's Qualities (Kyllonen)

- PPI has good psychometric properties
- Reliable
- Measures several factors reliably (cognitive and noncognitive)
- Predicts GPA in high school over standardized tests
- Faculty ratings match mentor ratings
- Is well received
- Long term consequential validity
- Will signal the importance of personal attributes
- Will help create more diverse and successful graduate programs



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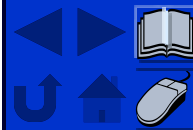
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Admissions to Medical Schools in Israel



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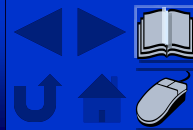
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The Israeli Admissions Policy

- **Meritocratic approach**
- **Based mainly on:**
 - Bagrut Certificate (GPA = HSR + External exams)
 - Scholastic aptitude test (PET)
 - **Adm = Bagrut + PET**
- **Reasons for using a composite score (Adm):**
 - More valid
 - A compensatory model

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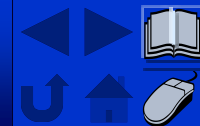
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Description of PET



		N items	Scale
V	Verbal Reasoning <ul style="list-style-type: none">• Words and Expressions• Analogies• Logic• Sentence Completion• Reading Comprehension• Letter-Exchange	60	100,20
Q	Quantitative Reasoning	50	100,20
E	English as a FL	54	100,20
PET	40%V + 40%Q + 20%E	164	500,100

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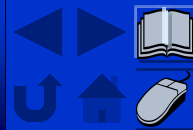
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Language Versions of PET



Source:

Hebrew

Arabic

Russian

Target:

French

Spanish

English

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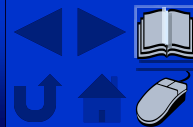
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Predictive Validity Coefficients

Predictor	Range	Average
Bagrut	0.30 – 0.49	0.41
PET	0.30 – 0.50	0.45
Adm. Score	0.49 – 0.64	0.55

A Meta-Analytic Study Carried Out Over 12 Years for All Departments in All Israeli Universities

(N > 100,000)



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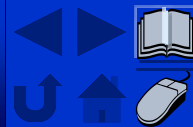
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Utility - Research Data

Ben-Shakhar, Kiderman and Beller (1996):

The addition of PET is clearly **justified**, from an expected utility perspective, if the primary goal of higher education is seen as that of producing **outstanding** graduates.

If, however, the goal is to provide **basic** post high school **education to masses** of students (with “success” meaning graduation even with minimal passing marks), **then admissions can be based exclusively on Bagrut scores or, even, be totally open.**



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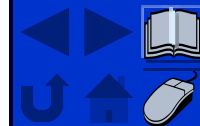


MSR

Israel Center for Medical Simulation

Screening of Candidates to Medical School Based on Non-Cognitive Parameters Using a Simulation-Based Assessment Center

**Naomi Gafni, Avital Moshinsky, Orit Eisenberg,
David Ziegler, and Amitai Ziv**



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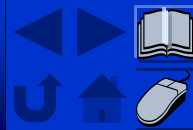


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Background

- Most medical schools rely primarily, and sometimes exclusively, on **cognitive factors** in student selection
- The tool most commonly used in an attempt to consider non-cognitive factors is the **interview**, which:
 - has strong face validity;
 - suffers from rater biases and context biases;
 - Has unsatisfactory reliability & validity



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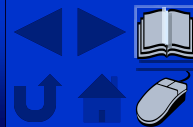


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Issues with the Interview

- “...entire programs of interviews have been evaluated and found to be invalid...”
- There were no differences in those originally chosen from the top of the interview ranking with those chosen from the bottom of the ranking (e.g., Dawes)
- “...near universal lack of predictive validity data supporting the use of the interview for students admissions...” (Reiter & Eva)



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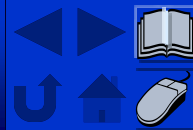


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New Approach

- **The Need** - To improve the screening of medical school candidates by introducing non-cognitive measurements into the equation
- **The Means** – Assessment Center (multiple measurement methods) heavily relying on simulation based behavioral evaluation



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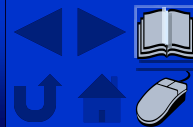
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MMI - Canada

The multiple mini interview (MMI) is an interview format that uses many short independent assessments, typically in a timed circuit, to obtain an aggregate score of each candidate's soft skills.

In 2001, the Michael DeGroote School of Medicine at McMaster University began developing the MMI system, to address two widely recognized problems. http://en.wikipedia.org/wiki/Multiple_mini_interview

- A pioneer and leading model with an already impressive body of published research (including preliminary validity data)
- Operational Assessment Center (bell-ringer style)
- Communication challenges are posed by an actor communicating with a student
- Items/tasks are open-ended to a large extent with no “correct” answer expected
- A scalable model in the sense that it can easily be tailored to meet the needs of other institutions



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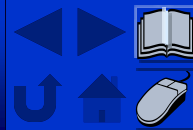
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Constructs measured:

- Decision making
- Ethics
- Communication
- Collaboration and team work
- Critical thinking
- Stress management
- (Familiarity with the health system)

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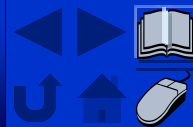
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The Need in Israel

To select the 100 candidates most suited to the **study and practice** of medicine from among 1,700 candidates –

- **Differentiate among those with very high cognitive scores (top 300):**
 - A Psychometric Entrance Test Score (PET)
 - High School Grade Point Average (GPA)
- **Missing component:**
 - Non-cognitive measures
- **Admission committee decision:**
 - 50% cognitive and 50% non-cognitive



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Three Components in the Assessment Center

**Biographical
Questionnaire**

90 minutes

21 Questions

**Essay
questions
related to
candidate's
past
experiences**

**Judgment and
Decision-Making**

45 minutes

3 Dilemmas

**Short
descriptions of
dilemmas that
require
candidate to
make decisions**

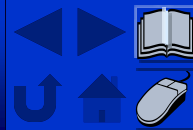
**Simulation Based
Behavioral
Stations**

120 minutes

8 stations

**6 individual stations
(6-9 minutes each)**

**2 group stations
(30 minutes each)**



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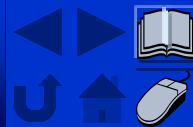
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Behavioral Stations – Rationale

Simulation is the **unique** component of the assessment center as:

- Observing people's **present behavior is a better predictor of future behavior** than their own subjective account of how they would behave
- The simulations reflect **common humane situations similar to those encountered by doctors**, and require no previous medical knowledge



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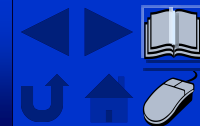
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Behavioral Stations – Examples



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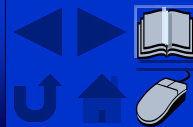
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Station Type	Description	Examples
Simulation	A challenging encounter with an actor	1. You are going to meet your friend, who is a school bus driver, just after you discovered he was drinking on the job. 2. Aggressive client
Debriefing	A structured interview regarding the candidate's performance in the simulation	"Describe the situation" "What would you have done differently?"
Interview	A structured mini-interview	"Why do you want to become a doctor?" "What is your opinion on abortions?"
Group	Groups of 6 candidates perform a task together	Divide a budget among 3 different sectors in a hospital ward.

MOR and MIRKAM

NITE and MSR are responsible for the development, administration, and scoring of two admissions systems used by **3** medical schools and **1** dental school:

- **MOR** since 2004 – 2 medical schools and 1 dental school
- **MIRKAM** since 2006 – 1 medical school



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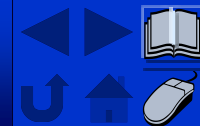
Two Versions of Assessment Center

MIRKAM	MOR
Judgment & Decision-Making Questionnaire – analysis of moral dilemmas	
Biographical Questionnaire – past experience	
8 structured Mini-Interviews <i>(various subjects and formats)</i>	8-9 varied Behavioral Stations <i>(simulations, debriefing, structured interview, group, and team stations)</i>



Took place on campus
24 candidates a day

Took place at a simulation
center



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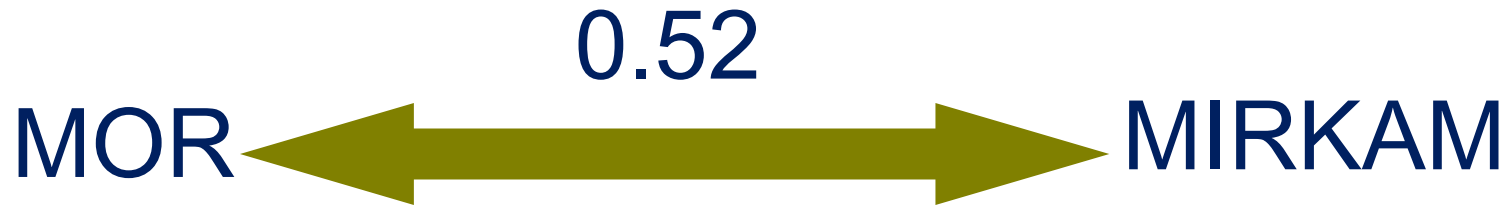
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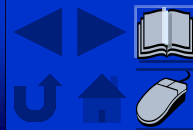
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The correlation between MOR and MIRKAM – MMI (N=1479)



This correlation sets an upper limit for any validity correlation coefficient that could be found



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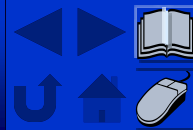
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Psychometric and other qualities



■ Reliability

- Inter rater reliability; test-retest; internal
- Day/station effects
- Training/experience effects

■ Validity

- Construct validity
- Predictive validity
- Face validity
- **Consequential validity**

■ Fairness

- Minority groups (language groups)
- Gender

■ Feasibility

- Cost benefit
- Cost-effectiveness

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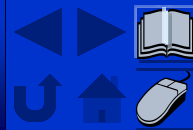


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Reliability

- **The data gathered at NITE makes it possible to obtain previously unobtainable reliability estimates for the MMI component of medical school admissions:**
 - large samples
 - over 4 years
 - in 2 assessment centers
 - that contained 2 variations of the MMI system
- **The coefficient alpha estimates varied somewhat from year to year and from one MMI system to another**



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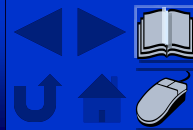
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Reliability Study



	Alpha	Test-Retest (Corrected)	MOR X MIRKAM (MMI)
MOR MMI	0.69	0.59	0.52
MOR Full	0.79	0.72	
MIRKAM MMI	0.67	0.43	
MIRKAM Full	0.76	0.65	
MOR+MIRKAM MMI	0.77	0.71	
MOR+MIRKAM Full	0.83	0.80	

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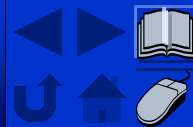


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Conclusions

- **Increasing the number of stations from 8 to 16/17 stations, increases the test-retest reliability of the behavioral stations from 0.59 (MOR) and 0.48 (MIRKAM) to 0.71**
- **...and of the entire assessment center from 0.68 (MOR) and 0.70 (MIRKAM) to 0.80**
- **8 stations alone do not equal the precision of other measures commonly used to facilitate admissions decisions**
- **The above reliability estimates are far superior to results obtained with a single pre-admissions interview, even when the interview is well structured and involves more than one rater**



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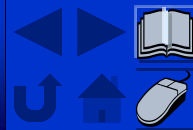


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Results – Validity

- **Predictive validity – to be evaluated in an up-coming longitudinal research...**
- **Correlation between the assessment center scores and candidates' cognitive scores approached zero**
- **Feedback questionnaires from candidates and raters indicate that the assessment center is perceived as highly fair and appropriate for the screening to medical school**



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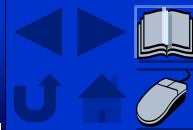
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Consequences

- The make-up of the student body changed by 20% each year
- Dramatic change in atmosphere at the faculty
- Very high national (and international) interest
 - two other faculties joined the process in 2006, 2007
- **Moral message to candidates, faculty & public**

Non-Cognitive Factors Are Important



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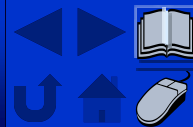
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Summary - continues

The use of selection tools for assessing non-cognitive attributes delivers an important message:

- In order to become a competent and ethically sensitive practitioner it is necessary, but not sufficient, to be a good student
- Attributes such as communication skills motivation, integrity, maturity, self-confidence and social awareness are highly valued and also necessary



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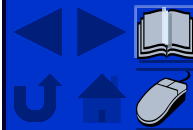
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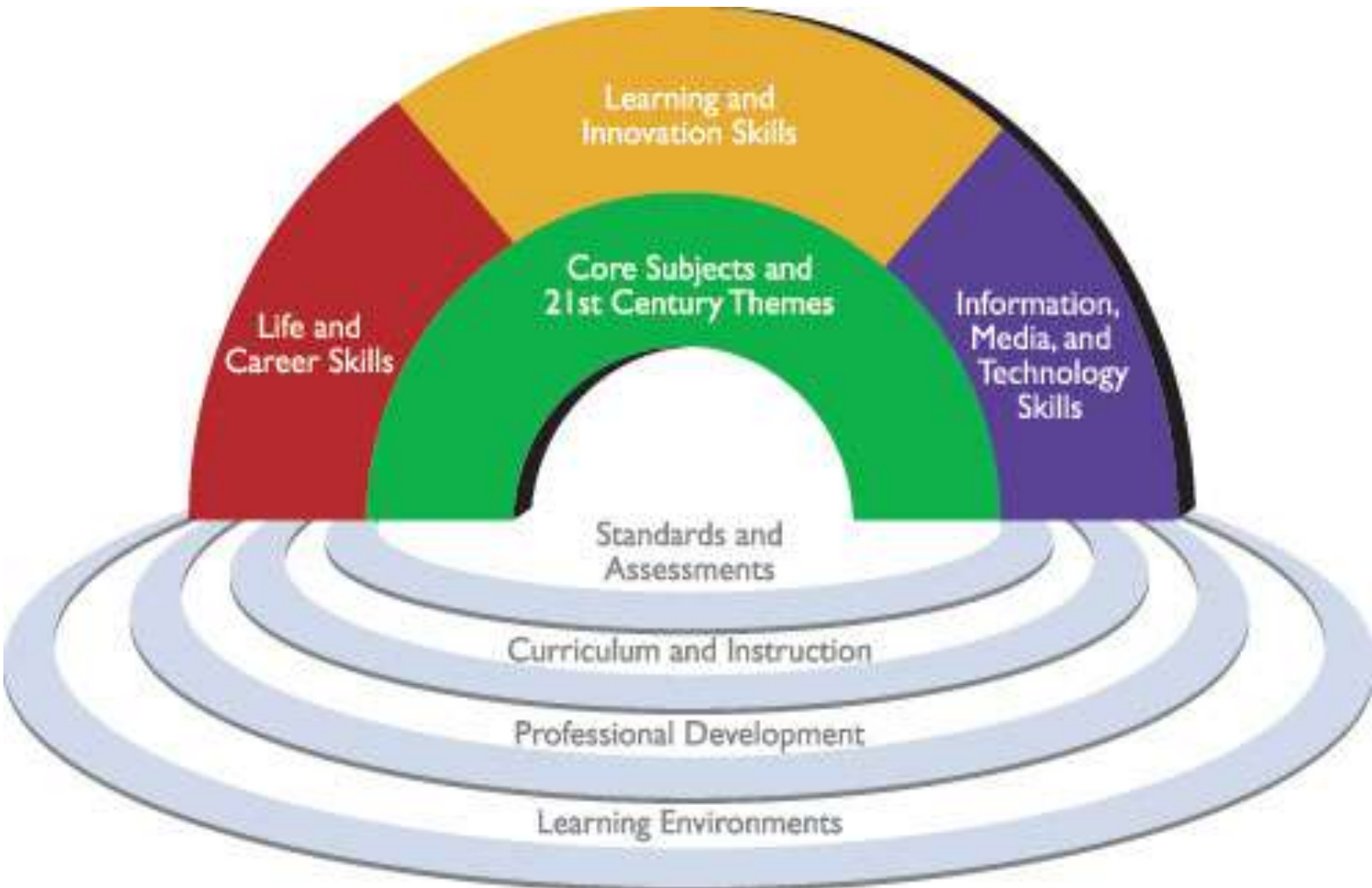
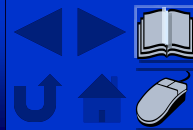


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Advances in the Assessment of 21st Century Skills

Framework for 21st Century Learning



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http://www.p21.org/documents/21st_century_skills_education_and_competitiveness_guide.pdf

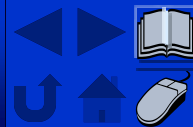
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The Rationale for Formulating “21st Century Skills”

- The 21st century is quite different than the 20th in the capabilities people need for work, citizenship, and self-actualization.
- 21st century skills are different than 20th century skills primarily due to the emergence of very sophisticated information and communications technologies.
- For example, the types of work done by people—as opposed to the kinds of labor done by machines—are continually shifting as computers and telecommunications expand their capabilities to accomplish human tasks.
- Economists Frank Levy and Richard Murnane (2004) highlighted a crucial component of what constitutes 21st century knowledge and skills.

Chris Dede (2009)

http://www.watertown.k12.ma.us/dept/ed_tech/research/pdf/ChrisDede.pdf



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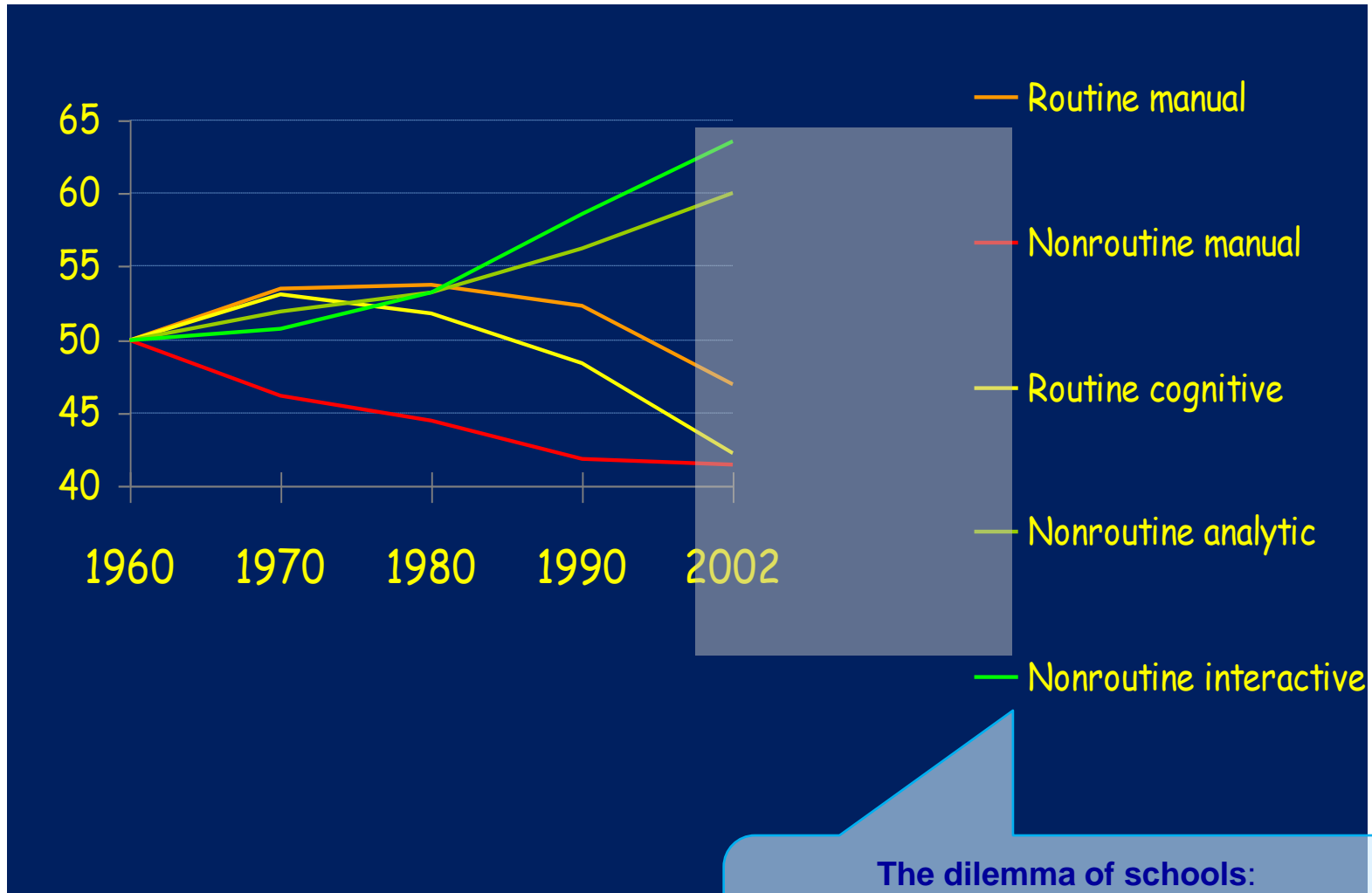
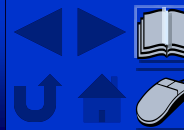


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How the demand for skills has changed

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



Levy and Murnane

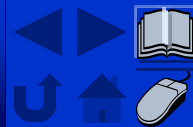
The dilemma of schools:
The skills that are easiest to teach and test are also the ones that are easiest to digitise, automate and outsource

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- Admission Tools
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- 21st Century

The College Work and Readiness Assessment

- The College and Work Readiness Assessment (CWRA) measures how students perform on constructed response tasks that **require an integrated set of critical thinking, analytic reasoning, problem solving, and written communication skills.**
- The CWRA is **delivered entirely over the Internet** in a proctored setting. Critical thinking, analytical reasoning, problem-solving, and writing are “collective outcomes” that cannot fully be taught in any one class or year; so all teachers and faculty have a responsibility to teach for such skills within each subject area and discipline.
- Performance Tasks Students must complete a **“real-life” activity** (such as preparing a memo or policy recommendation) by using a series of documents that must be reviewed and evaluated.
- Completion of these instruments does not require the recall of particular facts or formulas; instead, the measures assess the **demonstrated ability to interpret, analyze and synthesize information. Analytic Writing Tasks** Evaluate students’ ability to articulate complex ideas, examine claims and evidence, support ideas with relevant reasons and examples, sustain a coherent discussion, and use standard written English.

http://www.watertown.k12.ma.us/dept/ed_tech/research/pdf/ChrisDede.pdf



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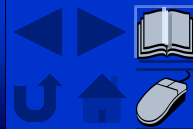
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The Programme for International Student Assessment (PISA)

- PISA is based on the OECD **Definition and Selection of Key Competencies project (DeSeCo)**,
- PISA seeks to measure how well young adults, at **age 15** and therefore approaching the end of compulsory schooling, are prepared to meet the challenges of today's knowledge societies – what PISA refers to as **“literacy”**.
- The assessment is forward looking, focusing 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 orientation reflects a change in the goals and objectives of curricula themselves, which increasingly address **what students can do** with what they learn at school and not merely whether they can reproduce what they have learned.
- **The domains of reading, mathematical and scientific literacy are covered not merely in terms of mastery of the school curriculum, but in terms of important knowledge and skills needed in adult**

http://www.watertown.k12.ma.us/dept/ed_tech/research/pdf/ChrisDede.pdf



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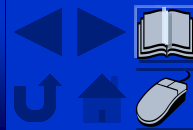
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Key Stage 3 ICT Literacy Assessment

- This ICT literacy assessment gauges students' ICT capability at the end of "Key Stage 3" (ages 12-13) in Great Britain's national curriculum.
- The test not only assesses students' ICT skills, but also their ability to **use those skills to solve a set of complex problems involving research, communication, information management, and presentation.** Test results provide both summative information - in the form of a national score for each student - and detailed feedback about student performance that could be used formatively to inform future teaching and learning.
- The ICT test is set in a complex virtual world, within which students carry out tasks using a "walled garden" of assets (e.g., text, pictures, data and "canned" websites) to take the test without access to the Internet. Students are also provided with a toolkit of applications to enable them to complete the tasks;
- all of these assets are generic software programs developed by the QCA to provide the same capabilities as familiar productivity software on the level playing field of a non-brand-specific platform.
- As students work through the test session, **their actions are tracked by the computer and mapped against expected capabilities** for each level of the national curriculum; this includes both **technical skills and learning skills**, such as "finding things out," "developing ideas" and "exchanging and sharing information." The information collected about a student's performance allows a score to be awarded along with a profile of individual strengths and weaknesses.

http://www.watertown.k12.ma.us/dept/ed_tech/research/pdf/ChrisDede.pdf



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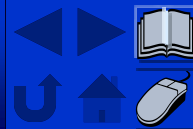


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Programme for the International Assessment for Adult Competencies (PIAAC)

- The OECD has contracted with ETS to manage the consortium responsible for the Programme for International Assessment of **Adult Competencies (PIAAC)**.
- The five-year study will examine **21st-century skills** of adults in more than two dozen countries.
- The assessment will take place across OECD and partner countries in 2011 with results published in 2013
- The survey assessment will measure the **literacy and numeracy skills** of people between the ages of 16 and 65. It also will look at how well these individuals **solve problems in technology-rich environments**.



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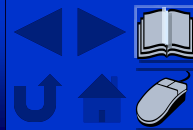


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21st Century Assessments

- **Authentic 21st century assessments** are the essential foundation of a 21st century education
- Assessments must measure all five results that matter — **core subjects; 21st century content; learning and thinking skills; ICT literacy; and life skills.**
- Assessment of 21st century skills should be **integrated with assessments of core subjects.** Separate assessments would defeat the purpose of infusing 21st century skills into core subjects.
- To be effective, sustainable and affordable, assessments **must use modern technologies** to increase efficiency and timeliness.
- **Standardized tests alone can measure only a few of the important skills and knowledge students should learn.** A balance of assessments, including high-quality standardized testing along with effective classroom assessments, offers students and teachers a powerful tool to master the content and skills central to success.



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Michael Barber (2009) labeled what students should know and be able to do as:

E(K+T+L)

K is for knowledge

T is for thinking

L is for leadership

The ability to know, to process in context, to act with sound judgment, is wrapped in

E—ethical underpinnings



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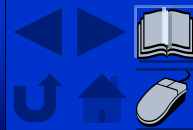
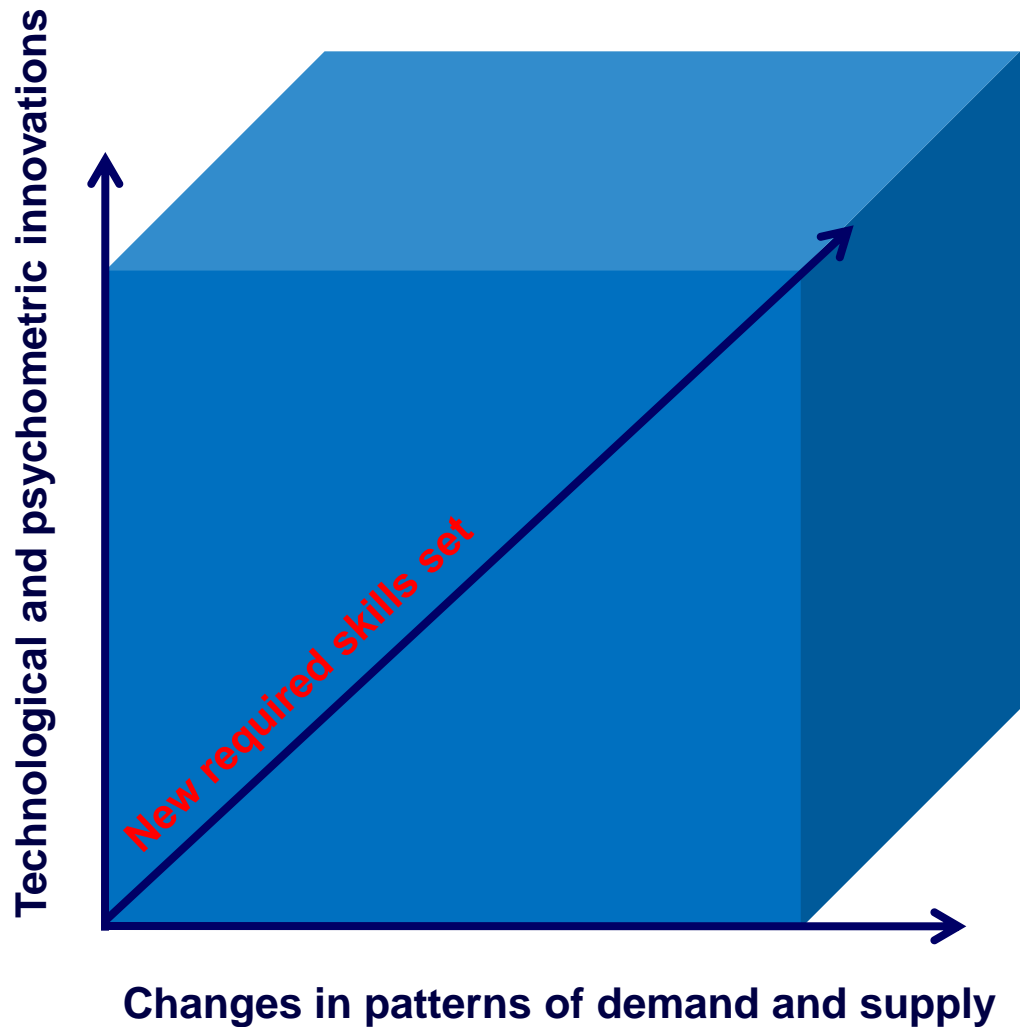
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Multi-Trait Multi-Method Approach to Admission



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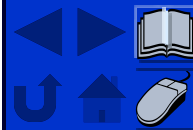
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Thank You!

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