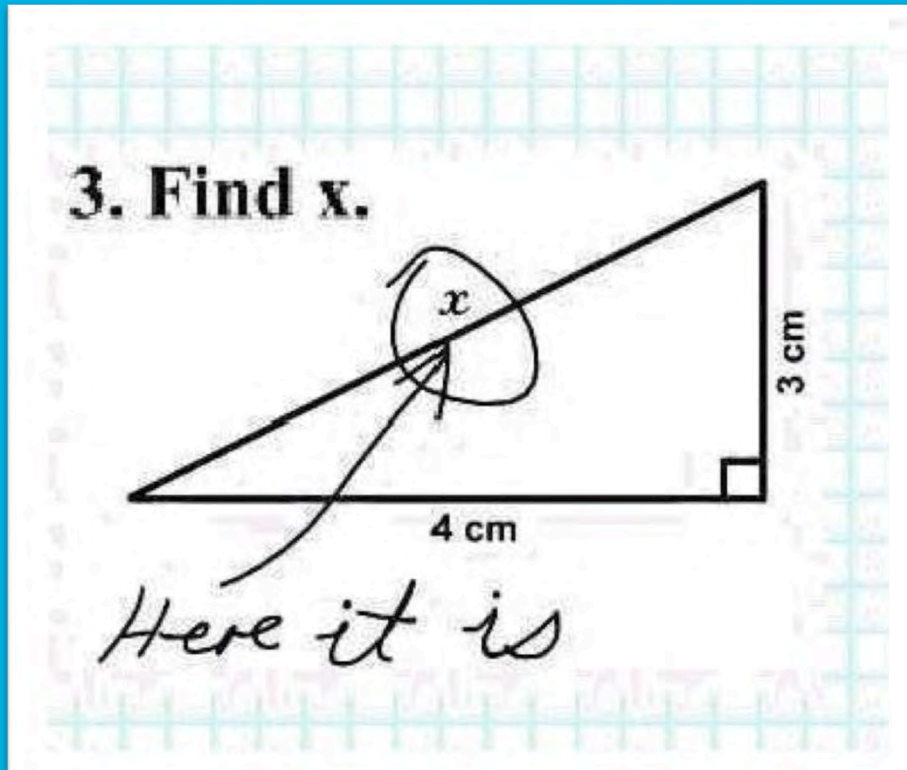
Quality assurance of assessment

Suzanne Schut
Educational Research and Development
Maastricht University
s.schut@maastrichtuniversity.nl

Shaping the future of Dental Education
ADEE/ADEA Meeting, London, UK
8-9 May 2017



Maastricht University

Why assessment?

- Determining whether the student is competent (or not).
- Stimulate (and steer) student learning.
- Feedback about the quality of instruction (education).

What is quality?

Quality is

- Exclusive, excellent
- Fitness for purpose (meet the requirements of the users)

Quality Criteria of assessment

- Educational impact
- Reliability
  - Similar decisions
  - False positives and negatives
  - Sample size
- Validity
  - Are you measuring what you want to measure?
  - Content and level (items)

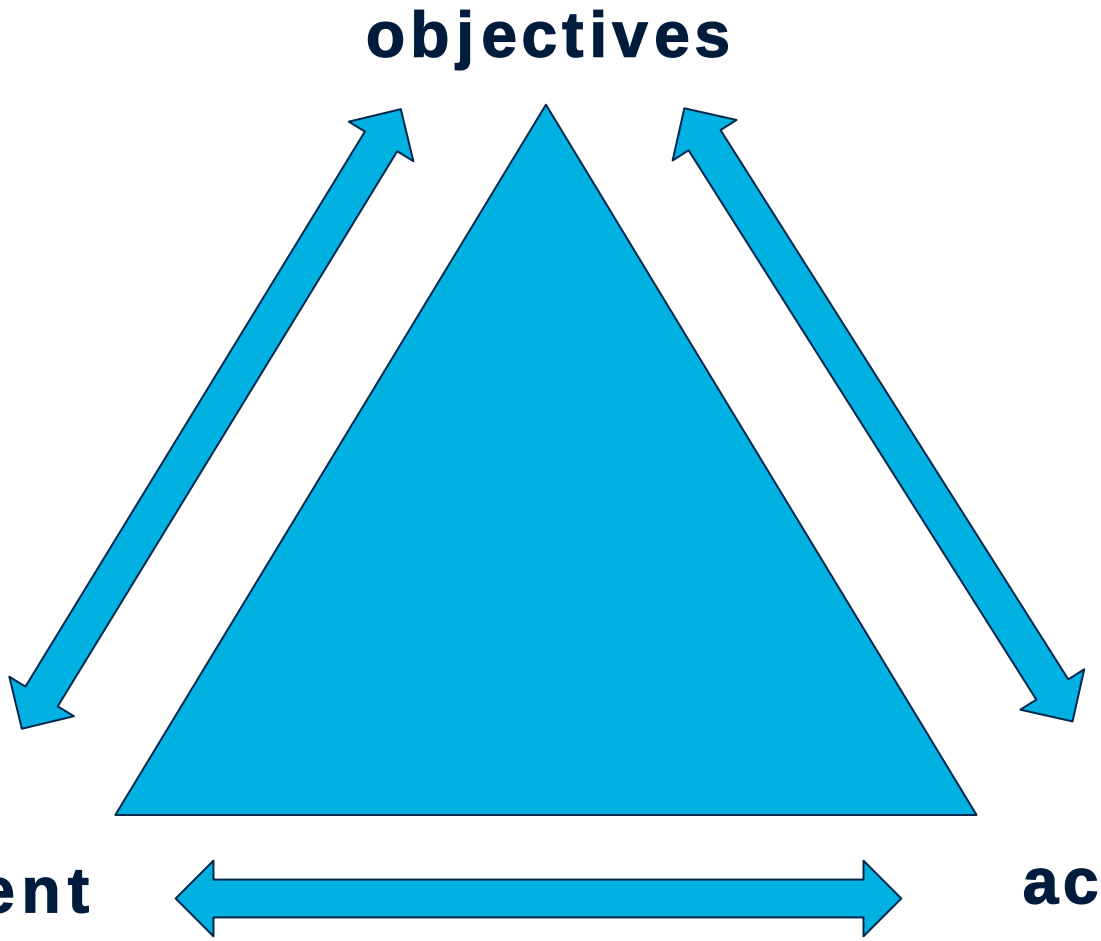
What's your purpose?

Type	Purpose	
	Assessment OF Learning	Assessment FOR Learning
Summative	X	x
Formative	x	X

Bennet, 2011

Formatieve feedback

Constructive Alignment



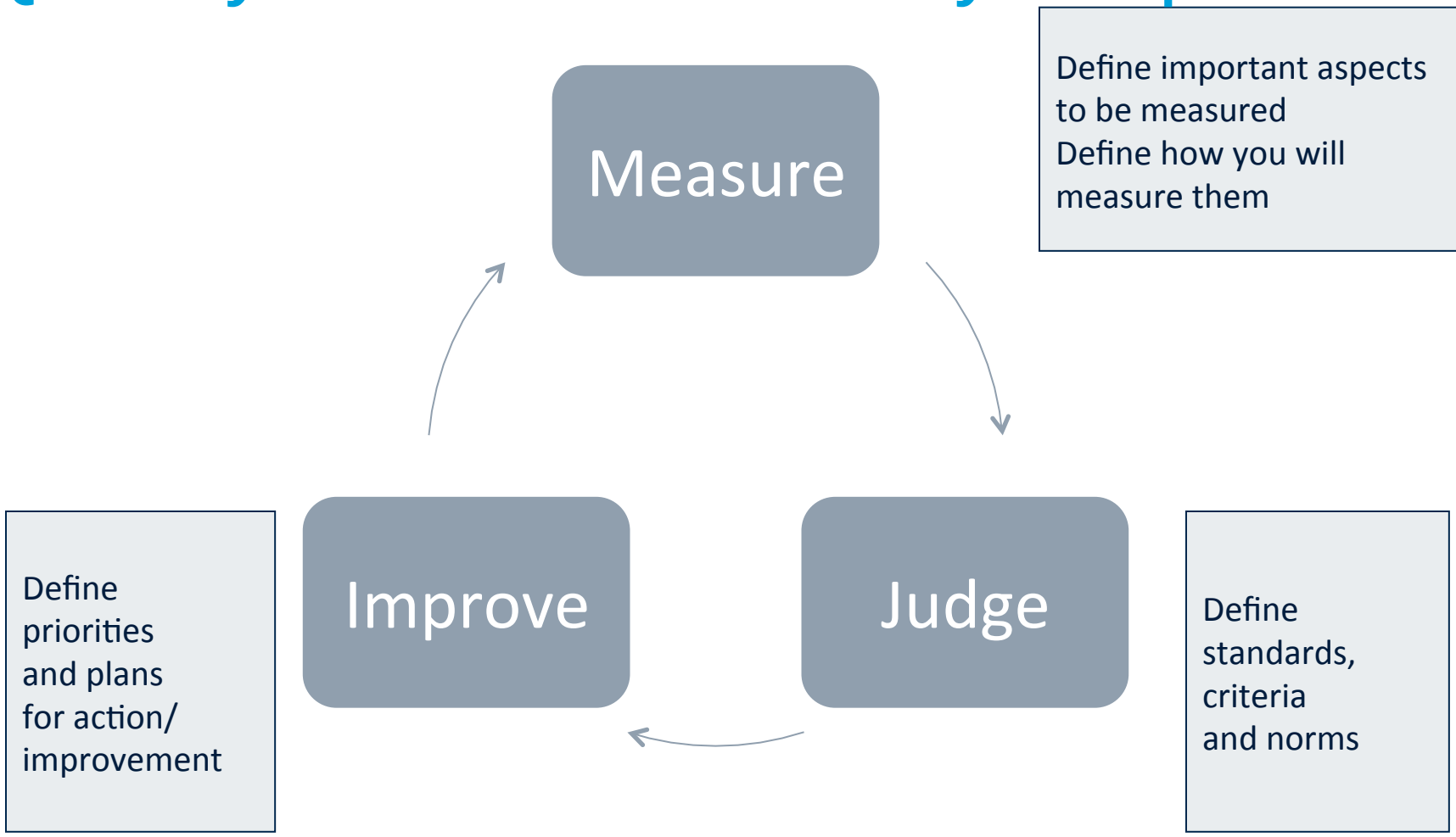
Biggs, 1996

Aims of quality assurance

- Control
  - To detect/signal weaknesses
  - Accountability purpose

- Improvement
  - To diagnose weaknesses
  - Improvement purpose

Quality assurance is a cyclic process

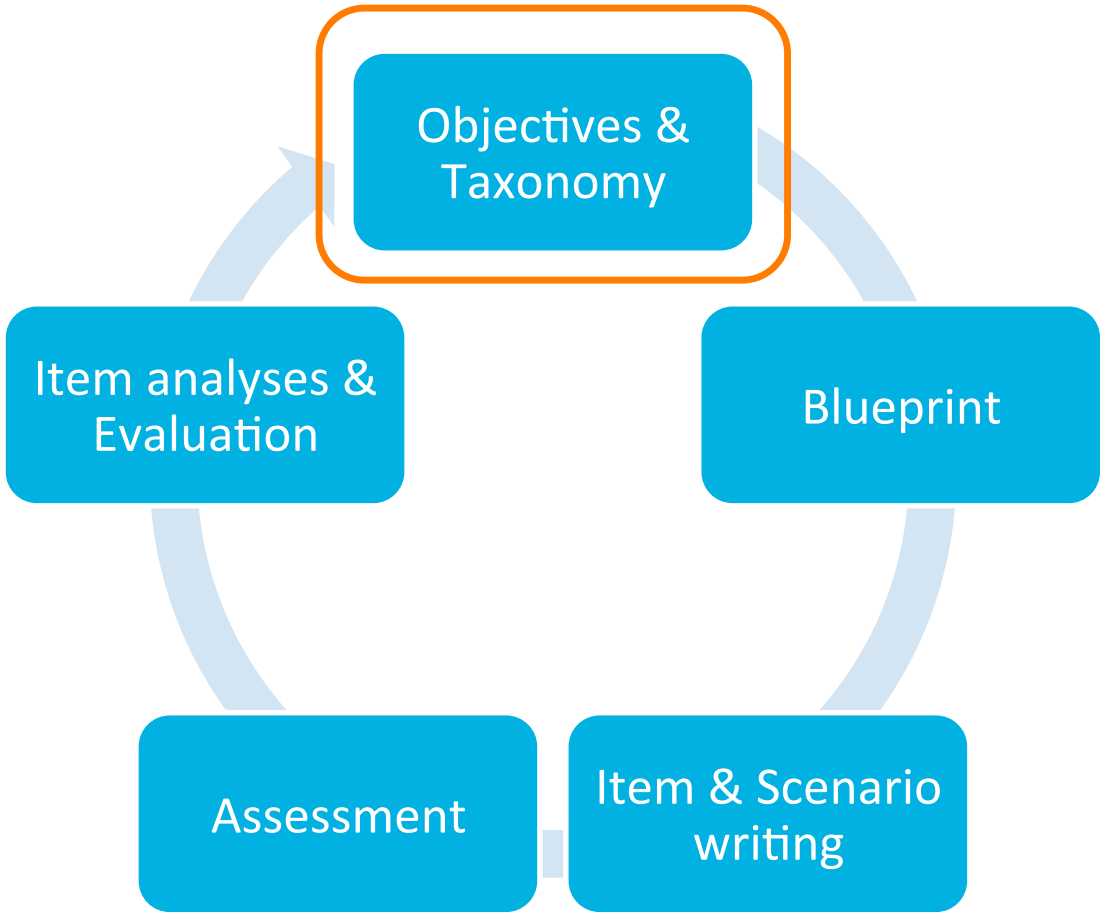


Quality assurance

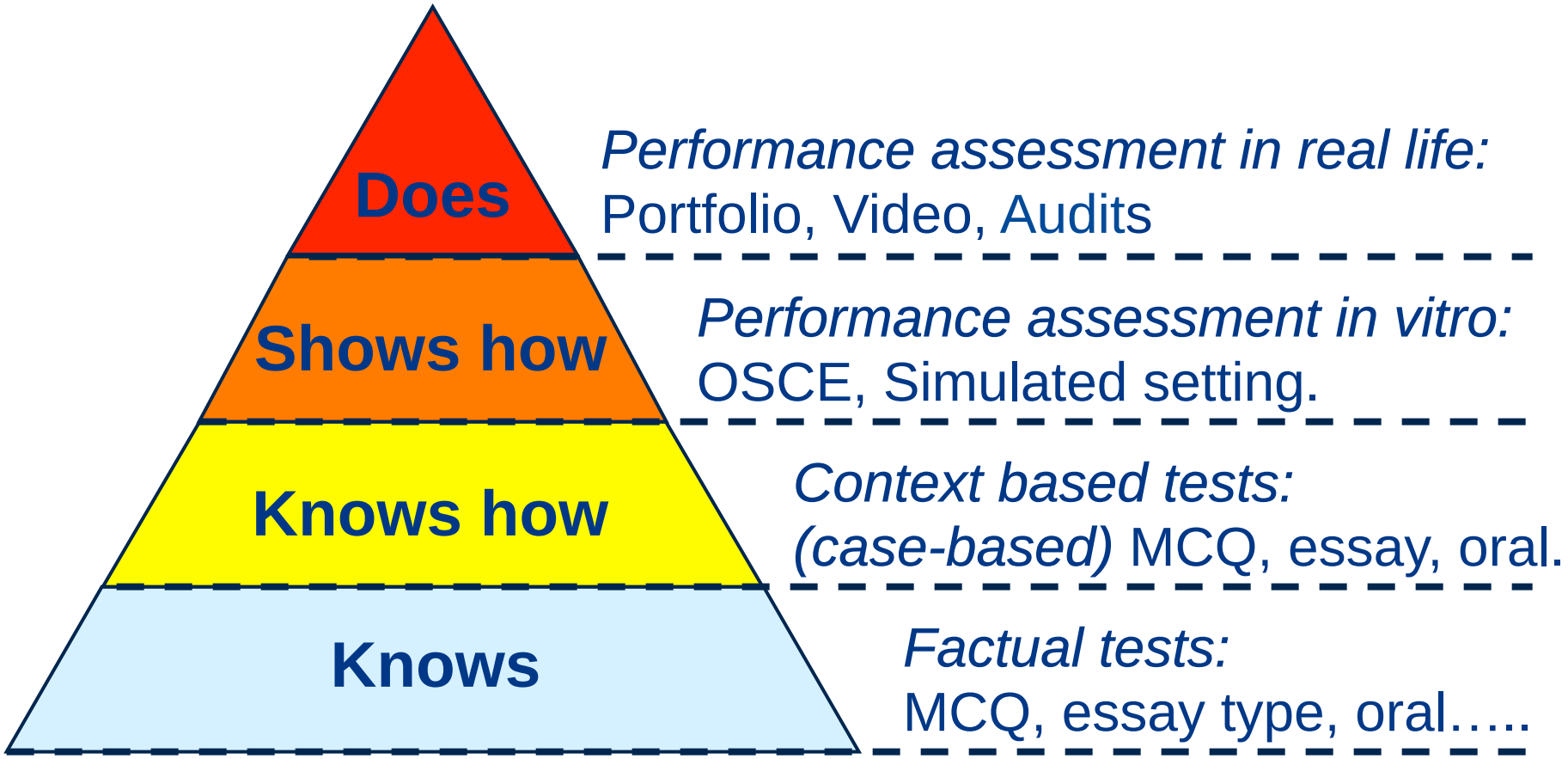
- Why?
  - aim
- What?
  - aspects, instruments, respondents
- Who?
  - who is responsible for what
- When?
  - when to evaluate
- How?
  - how should it lead to improvement

An example

Assessment process

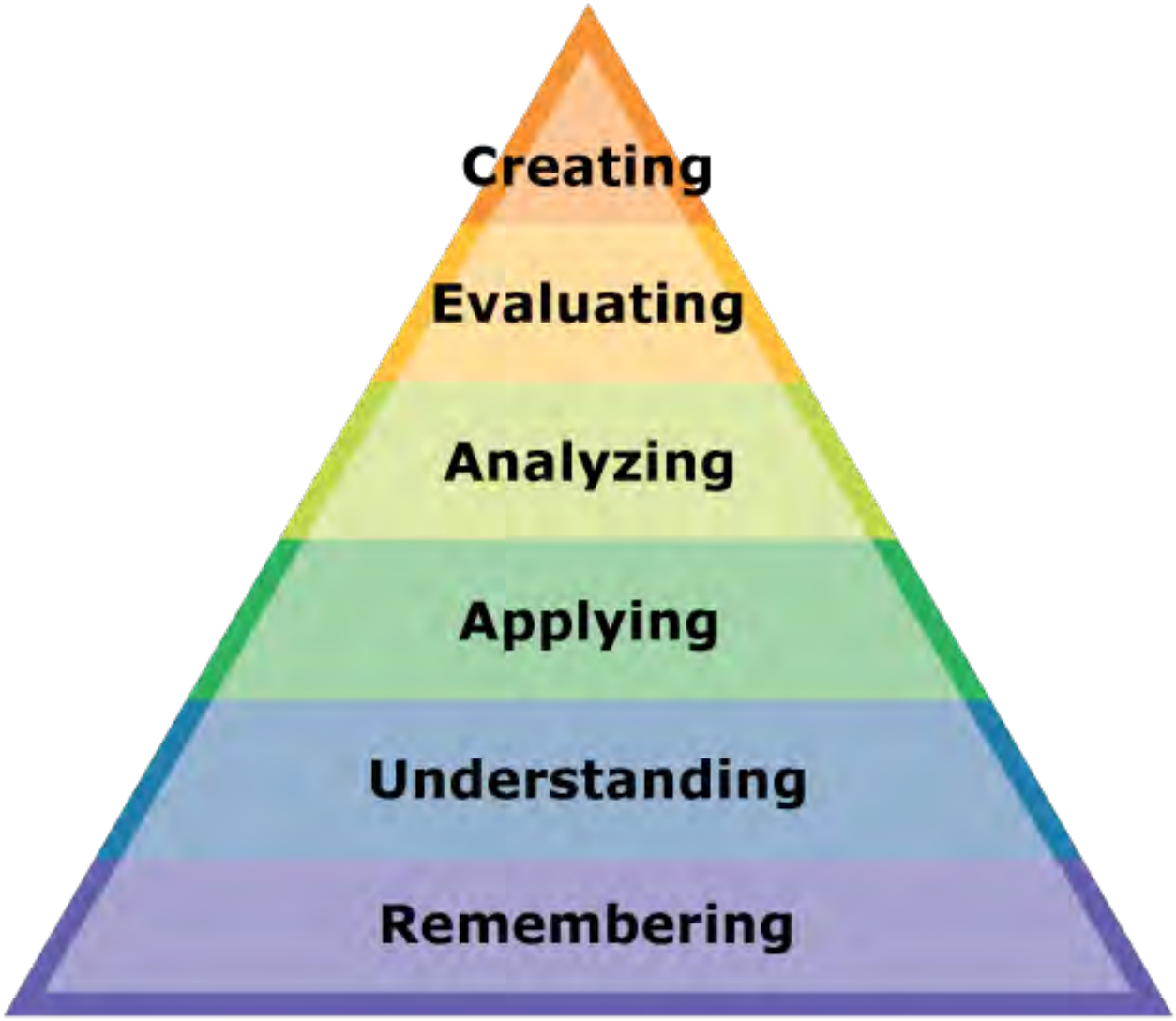


Miller's Pyramid

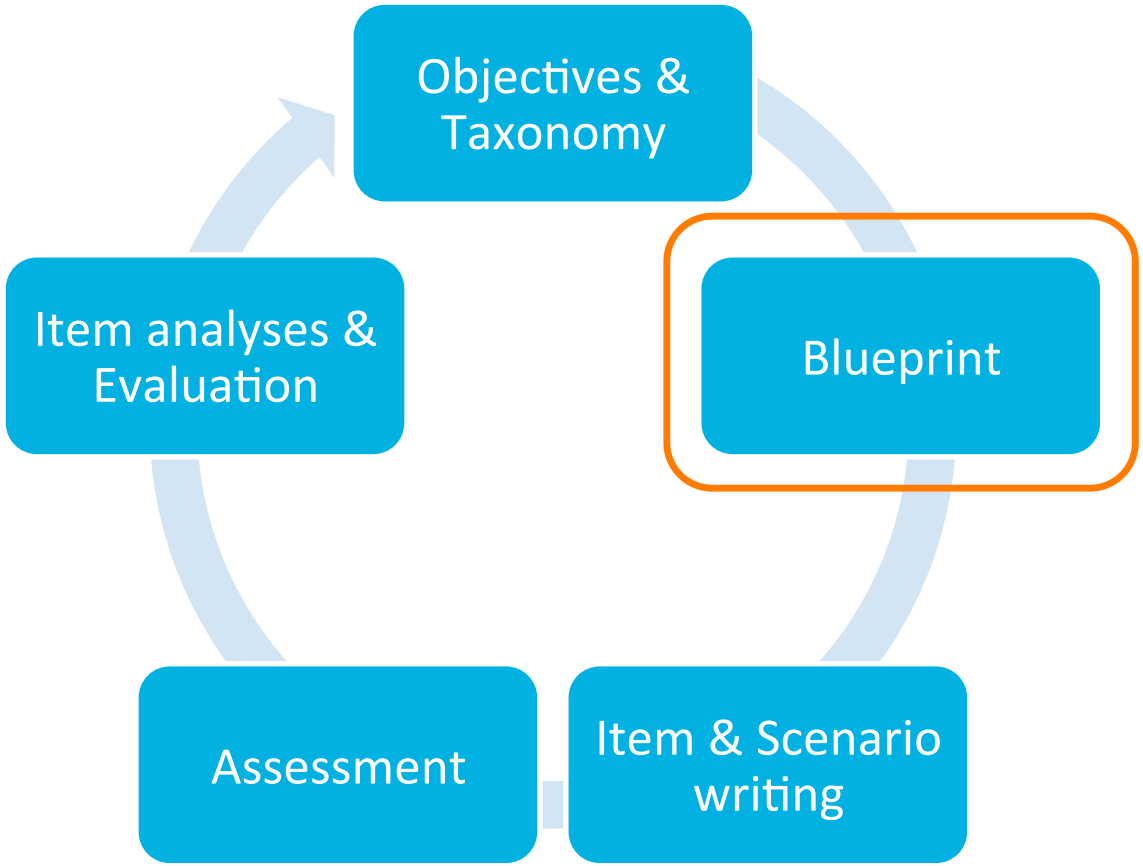


Miller GE. The assessment of clinical skills/competence/performance. Academic Medicine (Supplement) 1990; 65: S63-S7.

Bloom's Taxonomy



Assessment process



Maastricht University Leading in Learning!

1. Assessment plan:
Make an assessment blueprint for each test part & specify the topic/ objectives

Type	knowledge	Skills	attitudes	Total
Topic/objectives				
Total				

Maastricht University Leading in Learning!

1. Assessment plan:
Make an assessment blueprint for each test part & specify the topic/ objectives

Type	knowledge	Skills	attitudes	Total
Topic/objectives				
1.Anatomy of respiratory system				
2.Mechanisms of breathing				
3.Pathology of respiratory diseases				
4.Respiratory system examination				
5. Talking with patient about obesity				
6. Working professionally in teams				
etc.				
Total				

Maastricht University Leading in Learning!

1. Assessment plan:
Make an assessment blueprint for each test part & specify the topic/ objectives

Type	knowledge	Skills	attitudes	Total
Topic/objectives				
1.Anatomy of respiratory system	MCQ + OSPE			
2.Mechanisms of breathing	MCQ + Open questions			
3.Pathology of respiratory diseases	OSPE			
4.Respiratory system examination		OSCE		
5. Talking with patient about obesity		OSCE	OSCE	
6. Working professionally in teams		Assignment	Portfolio + tutor participation evaluation	
etc.				
Total				

2. Determine the desired ratio for each topic in percentage

Type	knowledge			Total
Topic/objectives	factual	understanding	application	
1.Anatomy of lungs				15%
2.Anatomy of ear				20%
3. Physiology of gas exchange				10%
4.Pathology of asthma				30%
5.Pathology of smoking related disease				5%
6. Sleep apnea				5%
etc.				15%
Total				100%

3. Determine the desired ratio for each level in percentage

Type	knowledge			Total
Topic/objectives	factual	understanding	application	
1.Anatomy of lungs	10%		5%	15%
2.Anatomy of ear	15%	5%		20%
3. Physiology of gas exchange		5%	5%	10%
4.Pathology of asthma	5%	10%	15%	30%
5.Pathology of smoking related disease		5%		5%
6. Sleep apnea			5%	5%
etc.		10%	5%	15%
Total	30%	35%	35%	100%

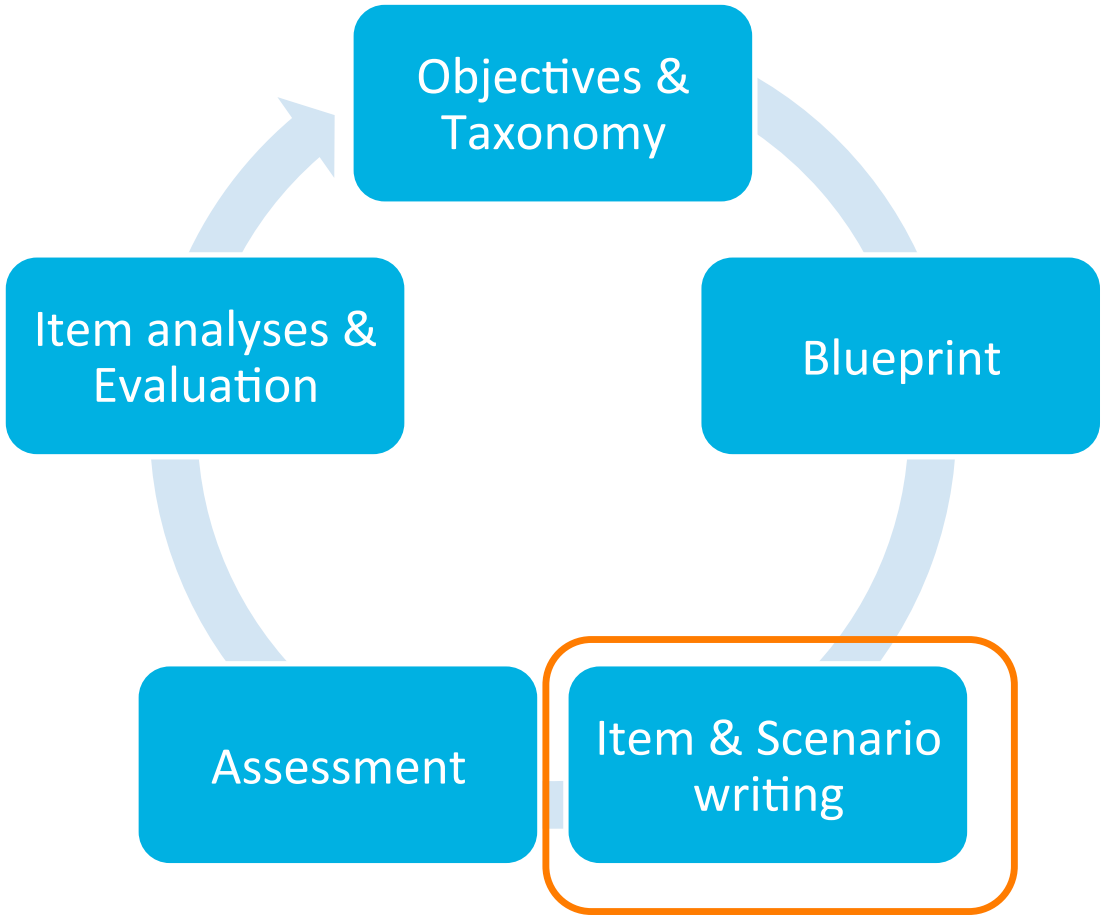
4. Determine desired number of questions and ask other authors

Type	knowledge			Total
Topic/objectives	factual	understanding	application	
1.Anatomy of lungs	10% (Dr. A)		5% (Dr.A)	15%
2.Anatomy of ear	15% (Dr. B)	5% (Dr. B)		20%
3. Physiology of gas exchange		5% (Dr. C)	5% (tutor A)	10%
4.Pathology of asthma	5% (Dr. C)	10% (Dr. C)	15% (Dr. C)	30%
5.Pathology of smoking related disease		5% (Dr. D)		5%
6. Sleep apnea			5% (Dr. D)	5%
etc.		10% (tutor B)	5% (Dr. E)	15%
Total	30%	35%	35%	100%

5. Write questions

Type	knowledge			Total
Topic/objectives	factual	understanding	application	
1.Anatomy of lungs	8		4	12
2.Anatomy of ear	12	4		16
3. Physiology of gas exchange		4	4	8
4.Pathology of asthma	4	8	12	24
5.Pathology of smoking related disease		4		4
6. Sleep apnea			4	4
etc.		8	4	12
Total	24	28	28	80

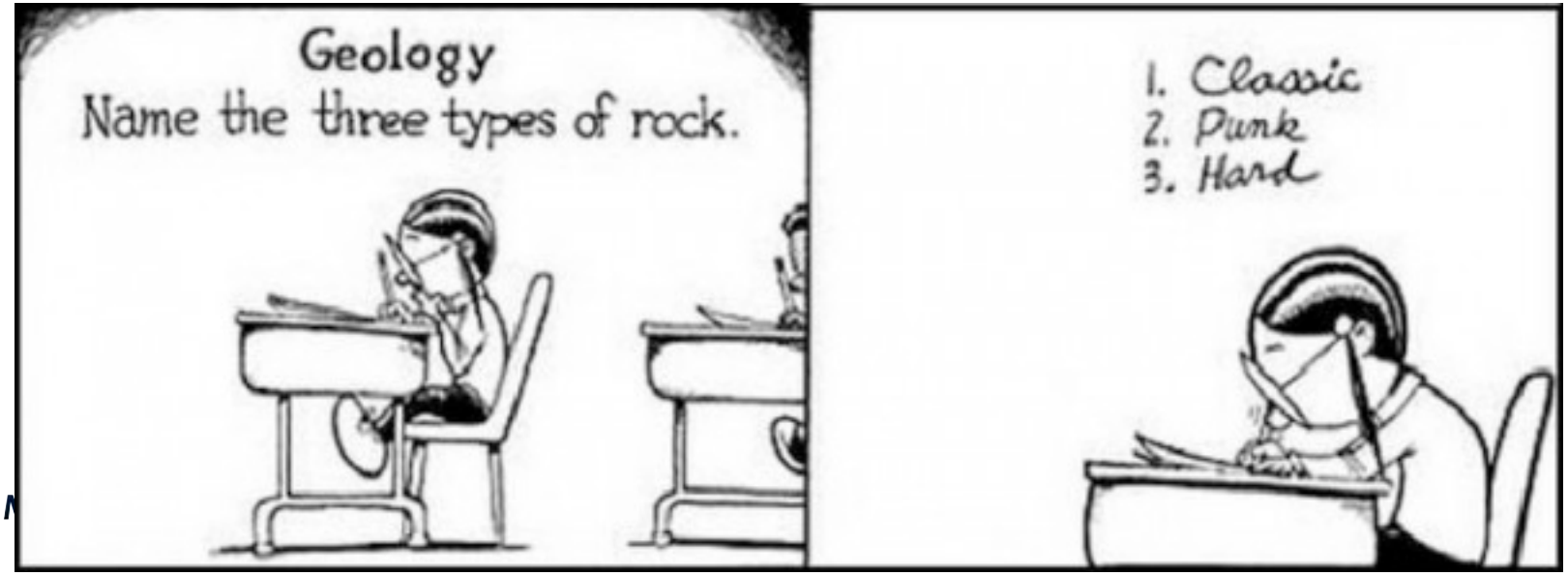
Assessment process



Maastricht University Leading in Learning!

General construction principles

- Relevance – meaningful questions
- Objectivity– the answer is ‘clear’
- Specificity– mastery of objectives is necessary (issues relating testwiseness)
- Efficiency – avoid superfluous information



Active verbs developed based on Bloom's Taxonomy

Knowledge	Understand	Apply	Analyze	Evaluate	Create
define	explain	solve	analyze	reframe	design
identify	describe	apply	compare	criticize	compose
describe	interpret	illustrate	classify	evaluate	create
label	paraphrase	modify	contrast	order	plan
list	summarize	use	distinguish	appraise	combine
name	classify	calculate	infer	judge	formulate
state	compare	change	separate	support	invent
match	differentiate	choose	explain	compare	hypothesize
recognize	discuss	demonstrate	select	decide	substitute
select	distinguish	discover	categorize	discriminate	write
examine	extend	experiment	connect	recommend	compile
locate	predict	relate	differentiate	summarize	construct
memorize	associate	show	discriminate	assess	develop
quote	contrast	sketch	divide	choose	generalize
recall	convert	complete	order	convince	integrate
reproduce	demonstrate	construct	point out	defend	modify
tabulate	estimate	dramatize	prioritize	estimate	organize
tell	express	interpret	subdivide	find errors	prepare
copy	Identify	Manipulate	survey	grade	produce
discover	indicate	Paint	advertise	measure	rearrange
duplicate	Infer	Prepare	appraise	predict	rewrite
enumerate	relate	produce	Break down	rank	role-play

Retrieved from http://www.teachthought.com/learning/249-blooms-taxonomy-verbs-for-critical-thinking/

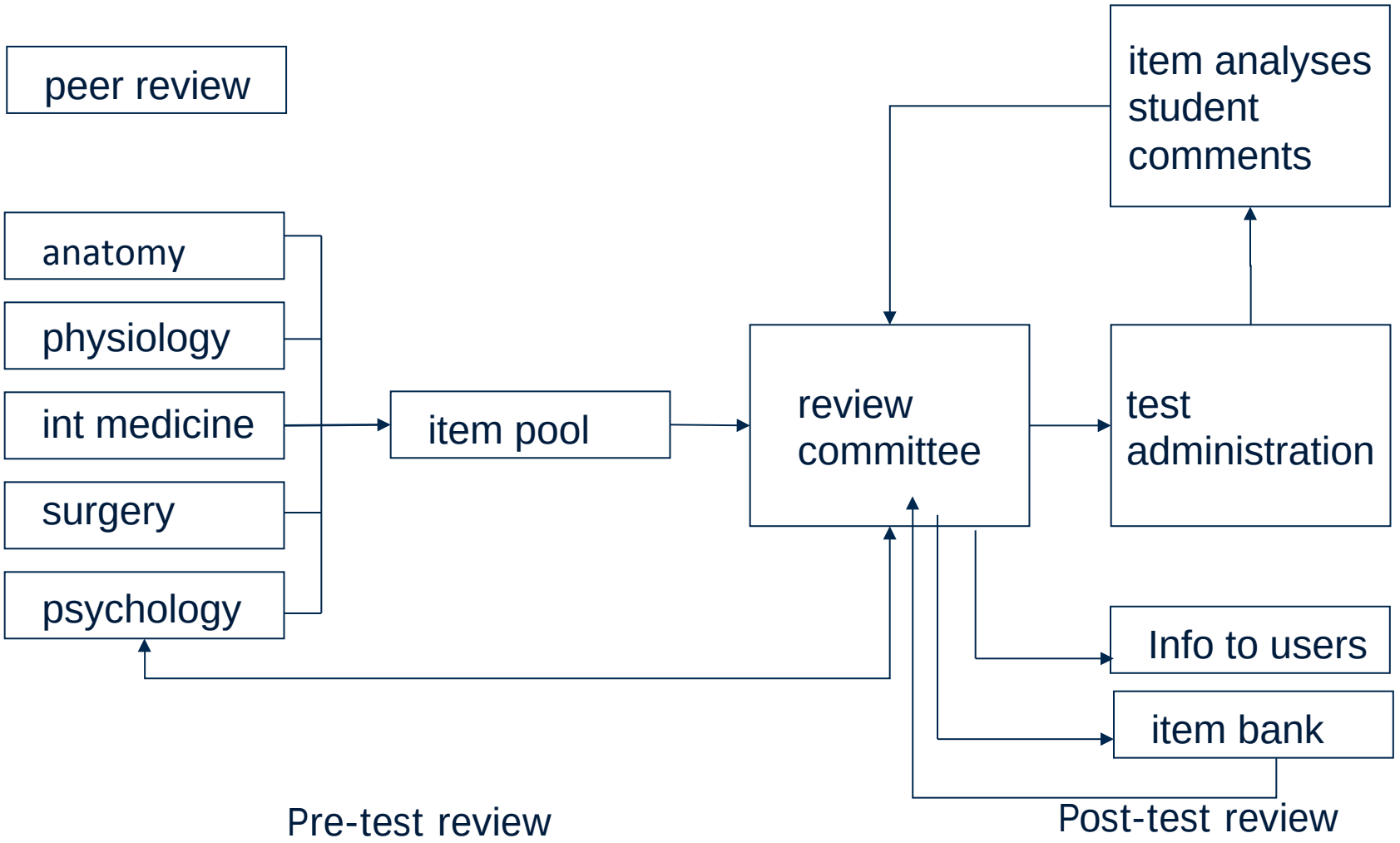
Constructing Written Test Questions For the Basic and Clinical Sciences

Third Edition
(Revised)

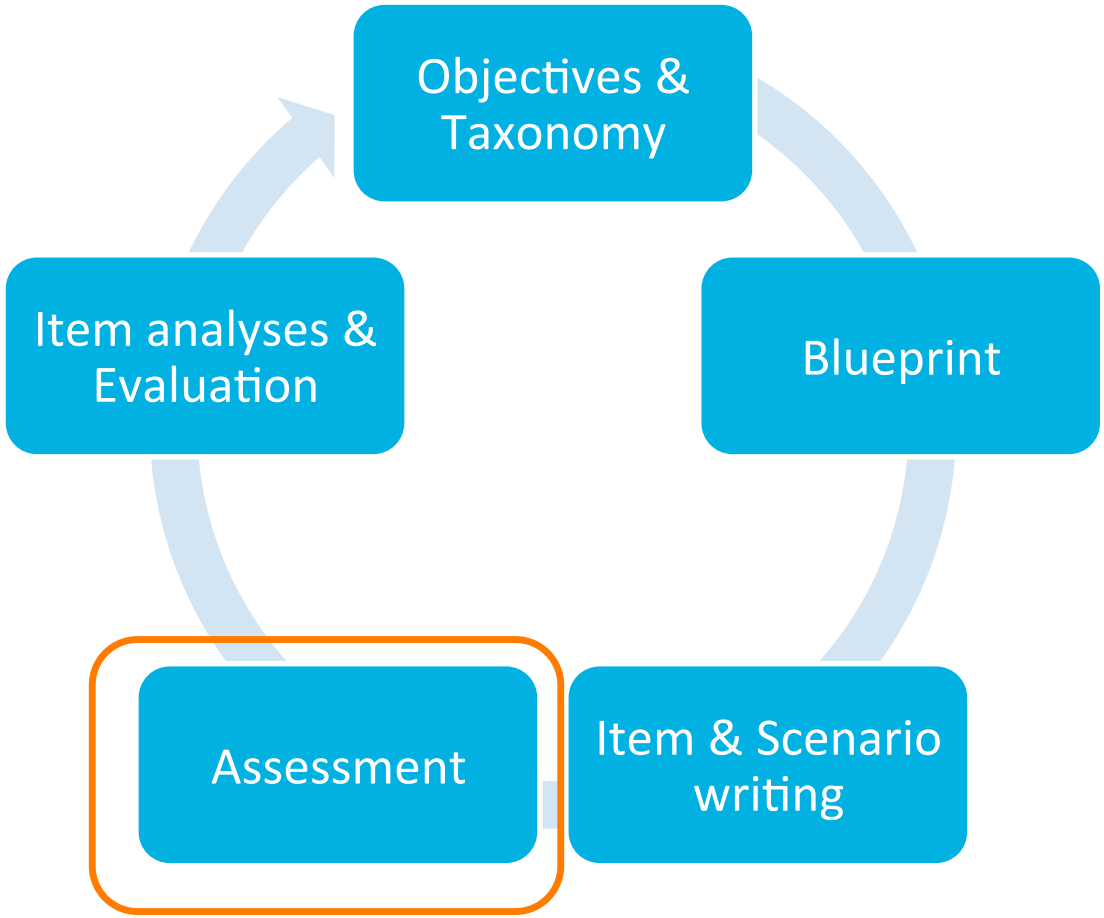
National Board of Medical Examiners
3750 Market Street
Philadelphia, PA 19104

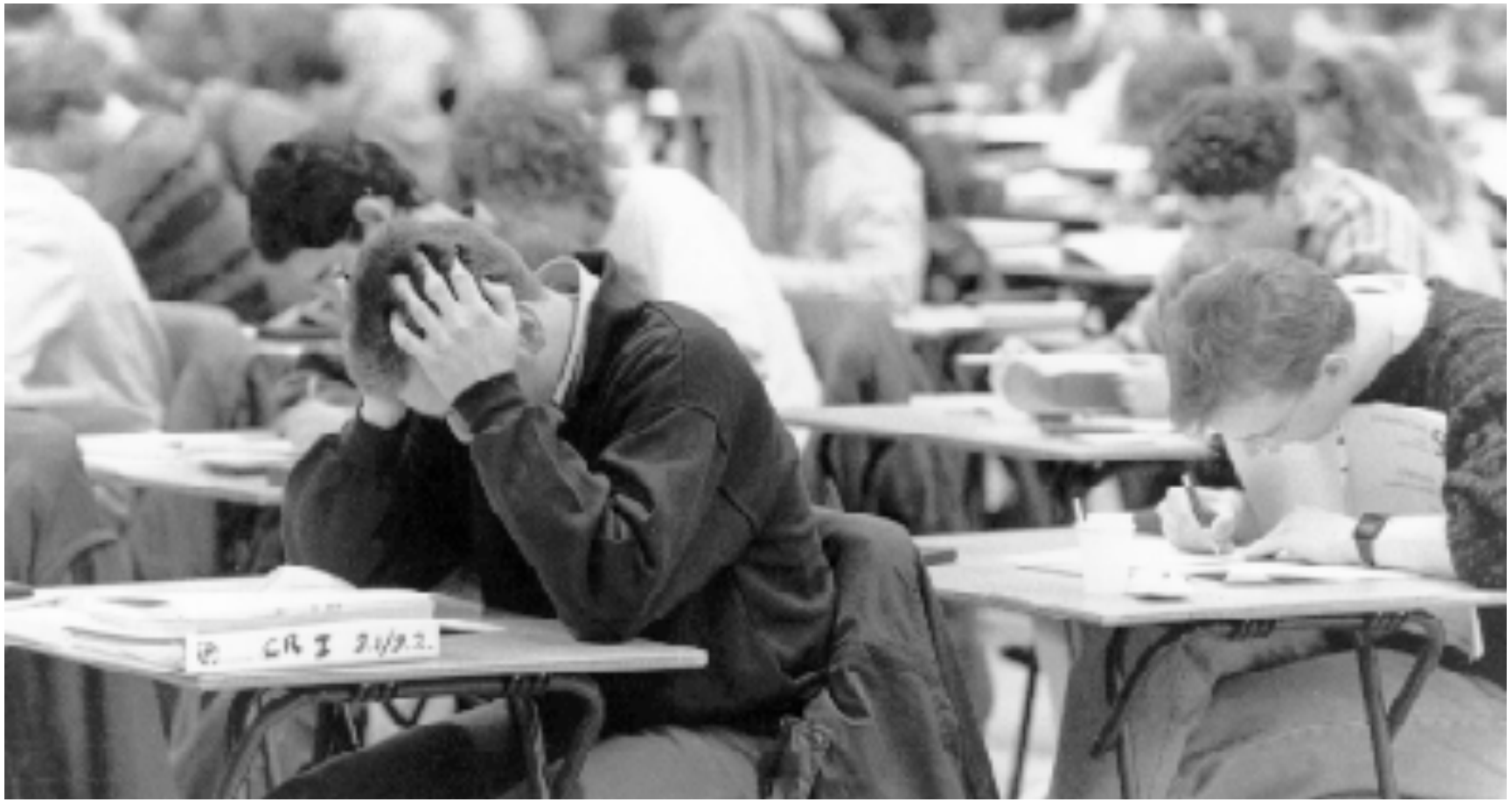
http://www.nbme.org/publications/item-writing-manual.html

Maastricht item review process

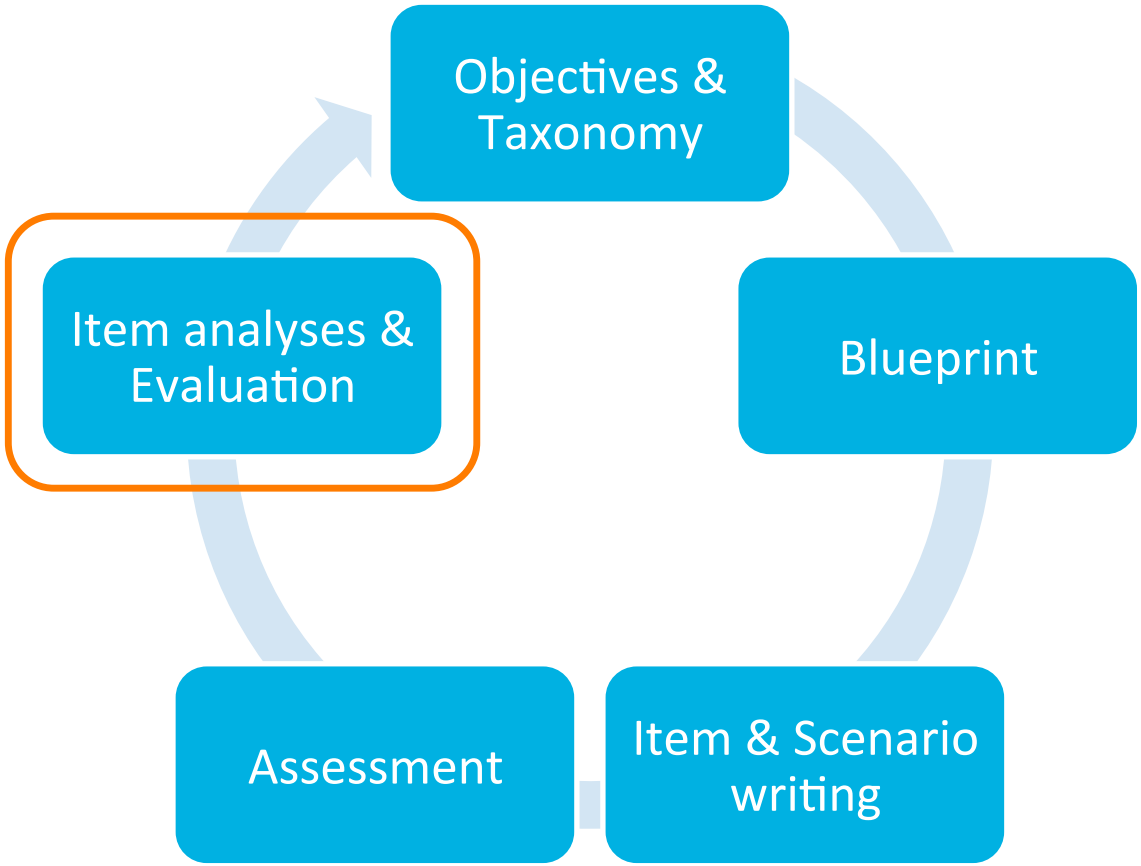


Assessment process





Assessment process



Psychometric analyses

Item Statistics				Item TOTAL Statistics	
	Mean	Std. Deviation	N	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
score1	,3077	,46604	52	,131	,800
score2	,5769	,49887	52	,400	,792
score3	,7308	,44789	52	,359	,794
score4	,3269	,47367	52	,081	,802
score5	,8269	,38200	52	,356	,795
score6	,9423	,23544	52	,228	,798

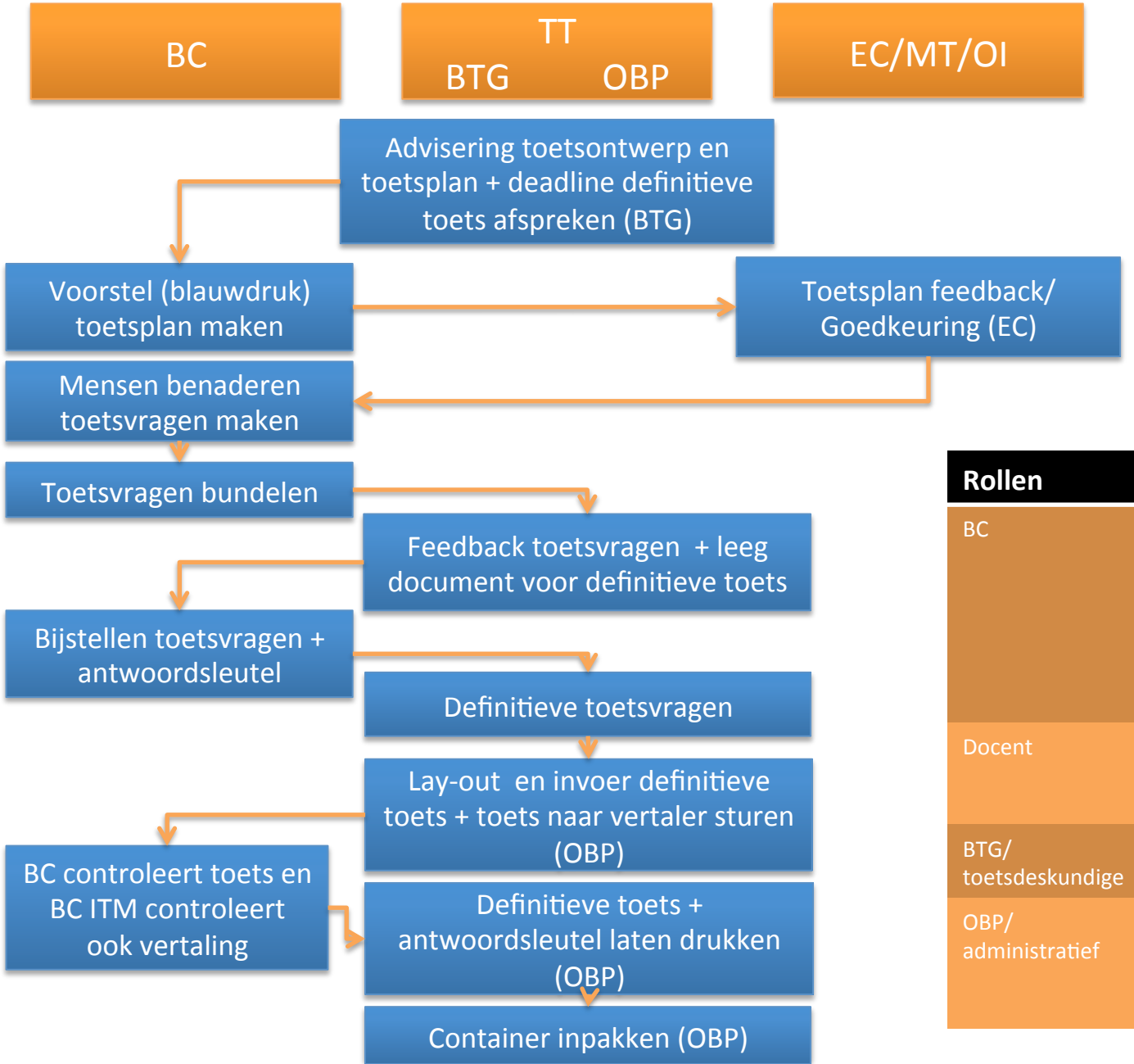
Vraag	opties	A	%	B	%	C	%	D	%	E	%	totaal
1	4	28	53,8%	5	9,6%	3	5,7%	16	30,7%			52
2	4	30	57,6%	3	5,7%	13	25%	6	11,5%			52
3	4	6	11,5%	4	7,6%	38	73%	4	7,6%			52
4	4	6	11,5%	10	19,2%	17	32,6%	19	36,5%			52
5	4	2	3,8%	7	13,4%	43	82,6%	0	0,0%			52
6	4	49	94,2%	2	3,8%	0	0%	1	1,9%			52

Student comments

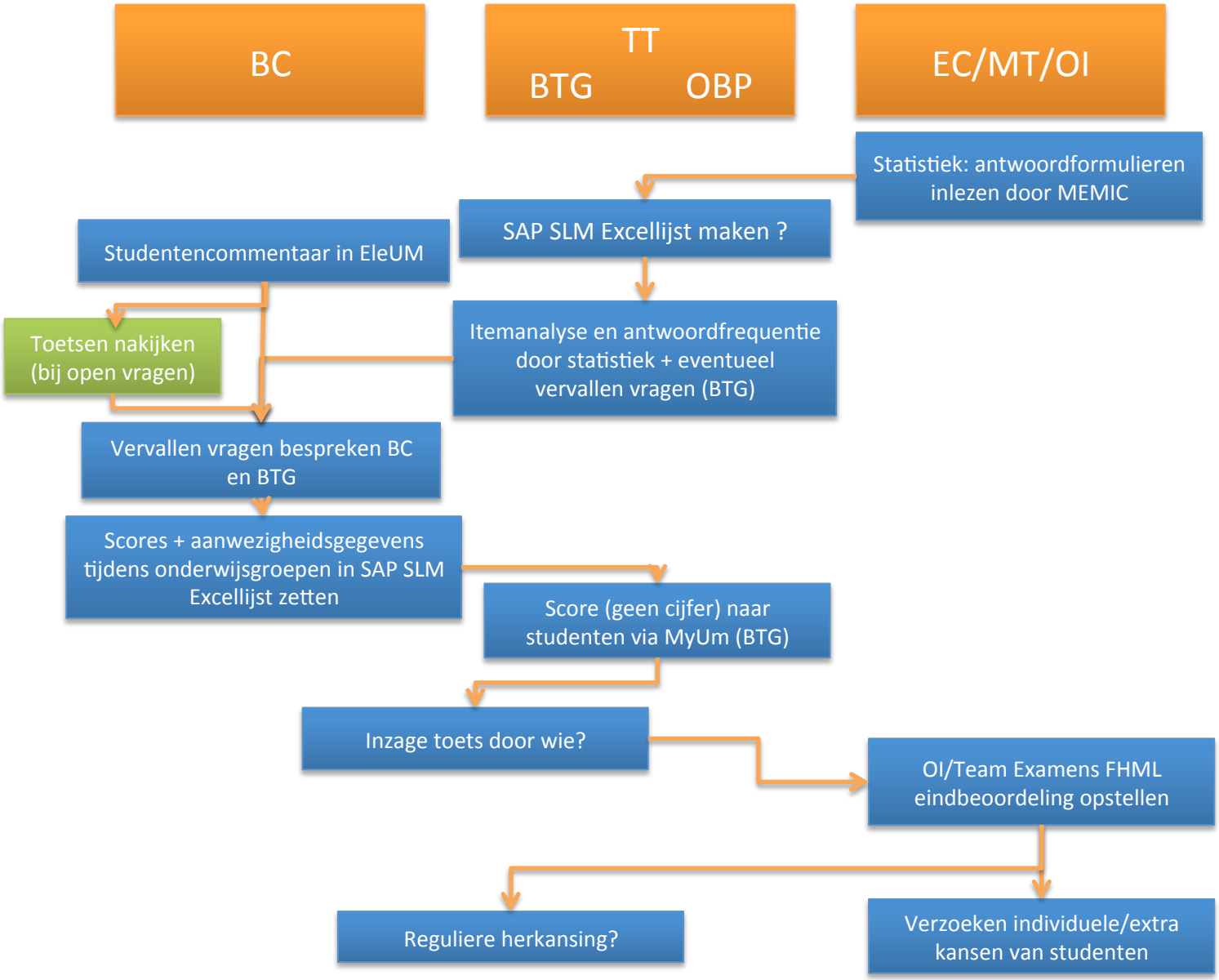
Determine final test

Set up plan for improvement

Who?



Rollen	Rechten
BC	- Maakt vragen - Review van vragen inhoudelijk van docenten - Past vragen aan - Maakt toets samenstelling
Docent	- Maakt vragen - Review van casus inhoudelijk
BTG/ toetsdeskundige	- Review van vragen toetstechnisch
OBP/ administratief	- Invoeren van vragen - Toets in elkaar zetten - Toets klaarzetten voor afname

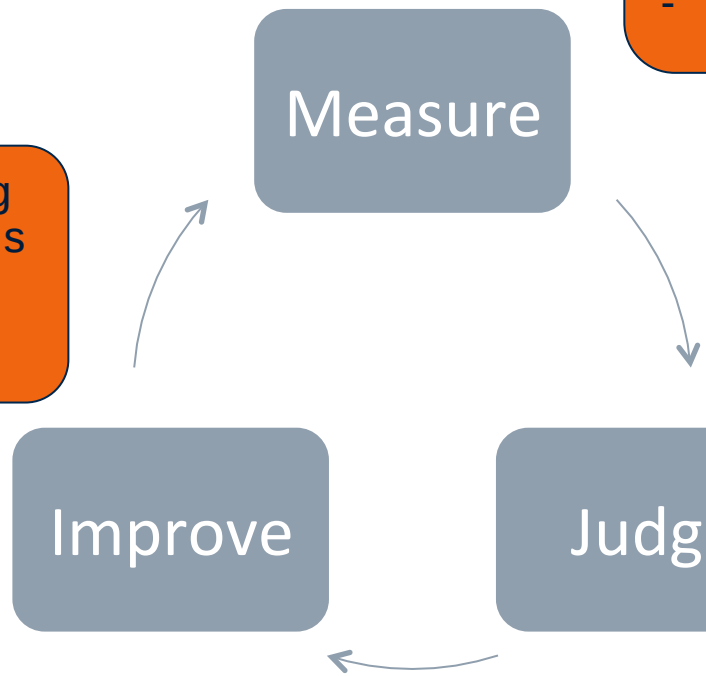

BC
TT
BTG
OBP
EC/MT/OI
Statistiek: antwoordformulieren inlezen door MEMIC
SAP SLM Excellijst maken ?
Studentencommentaar in EleUM
Toetsen nakijken (bij open vragen)
Itemanalyse en antwoordfrequentie door statistiek + eventueel vervallen vragen (BTG)
Vervallen vragen bespreken BC en BTG
Scores + aanwezigheidsgegevens tijdens onderwijsgroepen in SAP SLM Excellijst zetten
Score (geen cijfer) naar studenten via MyUm (BTG)
Inzage toets door wie?
OI/Team Examens FHML eindbeoordeling opstellen
Reguliere herkansing?
Verzoeken individuele/extra kansen van studenten

Assessment process

Characteristics of a system for quality assurance

Structural

- All aspects are included
- All parties concerned are involved
- Responsibilities are defined

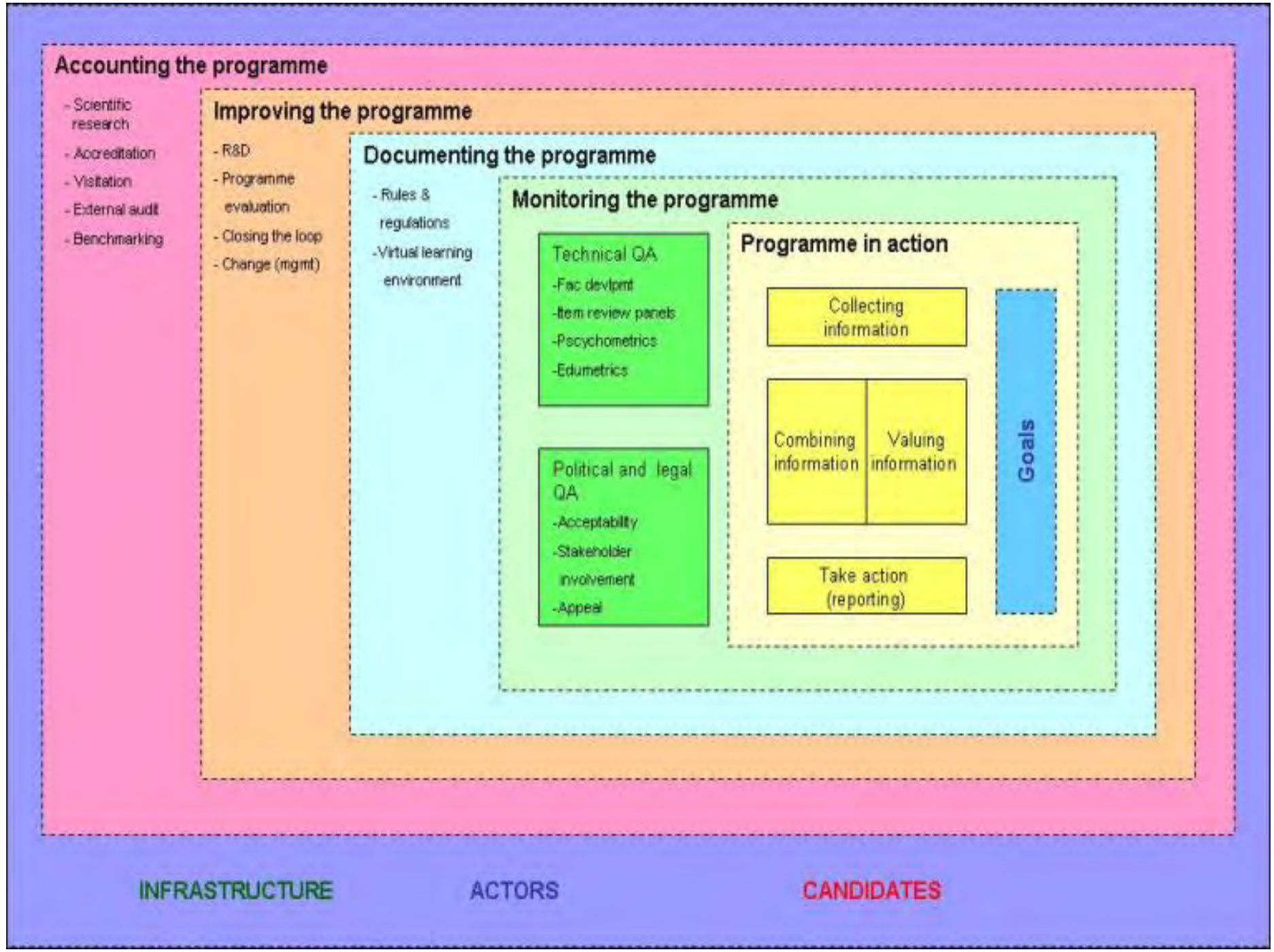


Integrated in working patterns of individuals and organizational structures

Integrated

Not on ad hoc basis but periodical with proper frequency (cyclic)

Systematic


Accounting the programme
- Scientific research
- Accreditation
- Visitation
- External audit
- Benchmarking
Improving the programme
- R&D
- Programme evaluation
- Closing the loop
- Change (mgmt)
Documenting the programme
- Rules & regulations
-Virtual learning environment
Monitoring the programme
Technical QA
-Fac devlpmt
-Item review panels
-Psychometrics
-Edumetrics
Political and legal QA
-Acceptability
-Stakeholder involvement
-Appeal
Programme in action
Collecting information
Combining information
Valuing information
Take action (reporting)
Goals
INFRASTRUCTURE
ACTORS
CANDIDATES

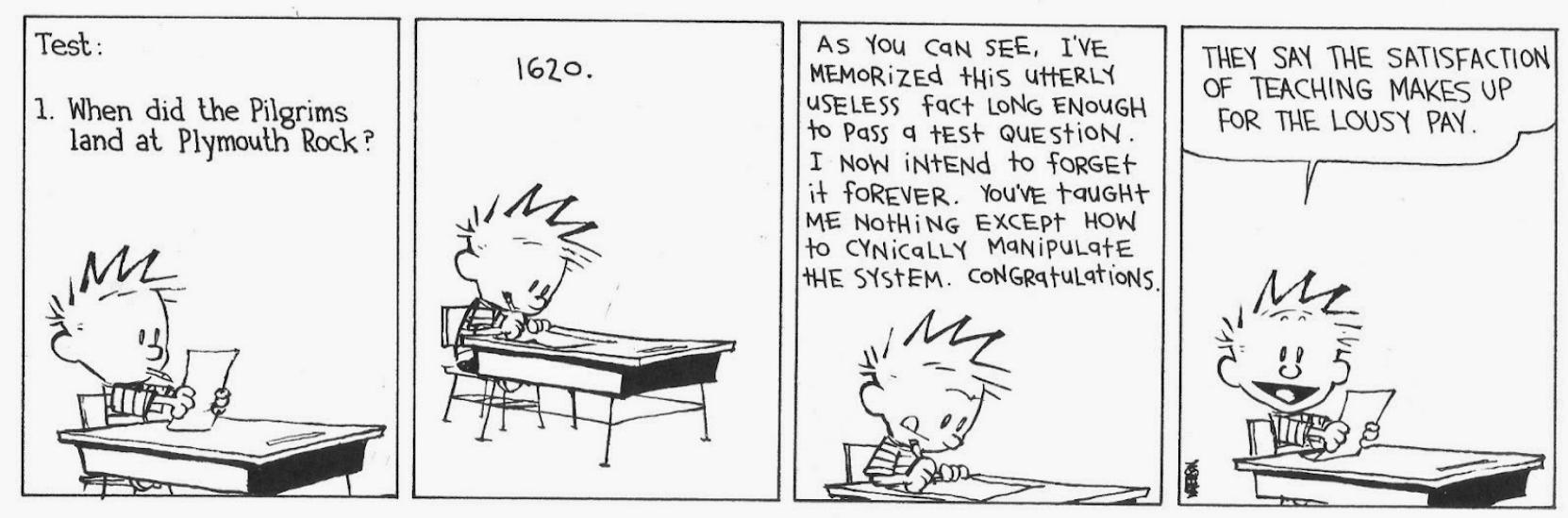
Quality assurance at your institute

- Why?
  - aim
- What?
  - aspects, instruments, respondents
- Who?
  - who is responsible for what
- When?
  - when to evaluate
- How?
  - how should it lead to improvement

Final conclusions

- Quality assurance is a cyclic process
  - Measure, judge, improve
- Quality assurance should be systematic, structural and integral

Assessment drives learning



More information

E-mail:
s.schut@maastrichtuniversity.nl

Safetynet procedures in judgements

original research

The use of qualitative research criteria for portfolio assessment as an alternative to reliability evaluation: a case study

E Driessen,[1] C van der Vleuten,[1] L Schuwirth,[1] J van Tartwijk[2] & J Vermunt[3]

AIM Because it deals with qualitative information, portfolio assessment inevitably involves some degree of subjectivity. The use of stricter assessment criteria or more structured and prescribed content would improve interrater reliability, but would obliterate the essence of portfolio assessment in terms of flexibility, personal orientation and authenticity. We resolved this dilemma by using qualitative research criteria as opposed to reliability in the evaluation of portfolio assessment.

METHODOLOGY/RESEARCH DESIGN Five qualitative research strategies were used to achieve credibility and dependability of assessment: triangulation, prolonged engagement, member checking, audit trail and dependability audit. Mentors read portfolios at least twice during the year, providing feedback and guidance (prolonged engagement). Their recommendation for the end-of-year grade was discussed with the student (member checking) and submitted to a member of the portfolio committee. Informa-

and 9 portfolios were submitted to the full committee. The final decision on 29 (12%) portfolios differed from the mentor's recommendation.

CONCLUSION We think we have devised an assessment procedure that safeguards the characteristics of portfolio assessment, with credibility and dependability of assessment built into the judgement procedure. Further support for credibility and dependability might be sought by means of a study involving different assessment committees.

KEYWORDS education, medical, undergraduate/*methods; educational measurement/*methods; curriculum/ standards; reproducibility of results; clinical competence/*standards; students, medical/*psychology; mentors.

Medical Education 2005; 39: 214–220
doi:10.1111/j.1365-2929.2004.02059.x

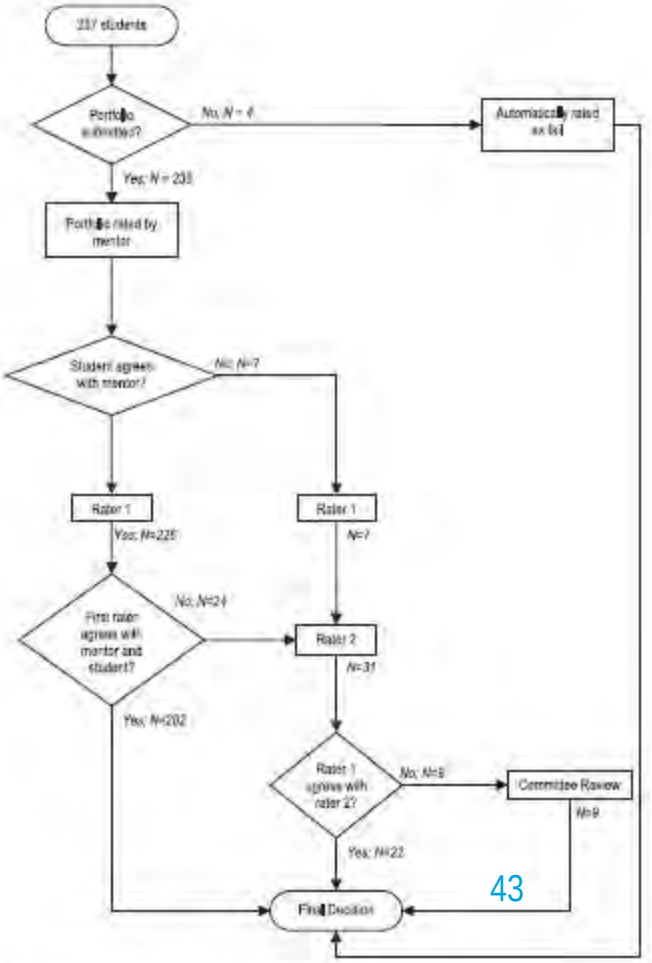


chart of the judgement procedure of the portfolio assessment committee.

Reliability!

- Be cautious with short tests!
  - Take a braod sample
    (over content, time, examinors, situations)
- Foster efficiency regarding:
  - Test format (choice)
  - Construction of items
- Realize the (huge) mistakes in decision making about pass/fail (because of error and bias)

Validity!

- Use assignments/tasks that are as authentic as possible (no matter what type of instrument)
- Keep it as simple as possible
- A good assessment programme uses multiple instruments

To conclude:

Assessment goal

- Realise: NO judgement is perfect
  - In case of doubt: second assessor
  - Judge from different perspectives

Determine Competence

- Use Assessment Strategically
  - Positive influence learning behaviour

Stimulate Learning

- Align assessment to instruction

Evaluation of instruction

PETER

4c) Expand

~~x^3+5x-2~~

$(a+b)^n$ very funny

$=(a+b)^n$

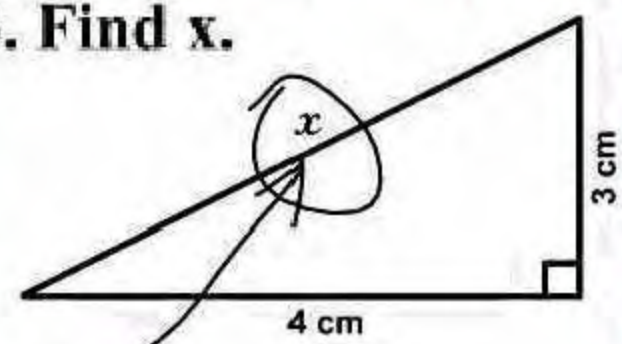
2 ?

$=(a+b)^n$

$=(a+b)^n$

etc...

3. Find x.



Here it is