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Blueprinting Assessment to Enhance Constructive Alignment

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Blueprinting Assessment to Enhance Constructive Alignment

Ottawa Conference
Canadian Conference of Medical Education

26-29 April 2014

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IRISH RESEARCH COUNCIL
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Overview

- Key concepts
- Context
- Research Study
- Outcomes
- Discussion



**Supported by Irish Research Council,
New Foundations Scheme**



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Key Concepts



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Key Concepts 1: Blueprinting Assessment

- Facilitates alignment of assessment and learning outcomes ([Coderre et al., 2009](#), [Hamdy, 2006](#)).
- Enhances validity and ensures appropriate sampling of content
- Most efficient method to aid test construction ([Hodges, 2007](#)).
- One key element of curriculum mapping ([Boland et al., 2013](#)).



Key concepts 2: Constructive alignment



Figure 1: Constructive alignment between learning outcomes, learning and teaching activities and assessment (adapted from Biggs 1999: 27)

Validity

A test is valid if it measures what it purports to measure



Context



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Context 1.

NUIG School of Medicine and Affiliated Hospitals (Academies)

Sligo Regional



Letterkenny General



Roscommon



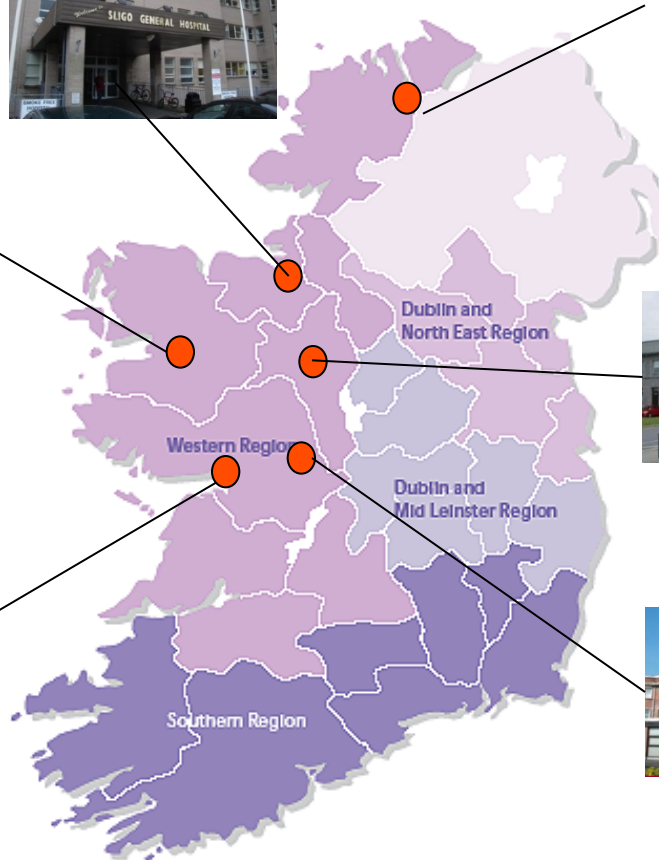
Portlincula



Mayo General



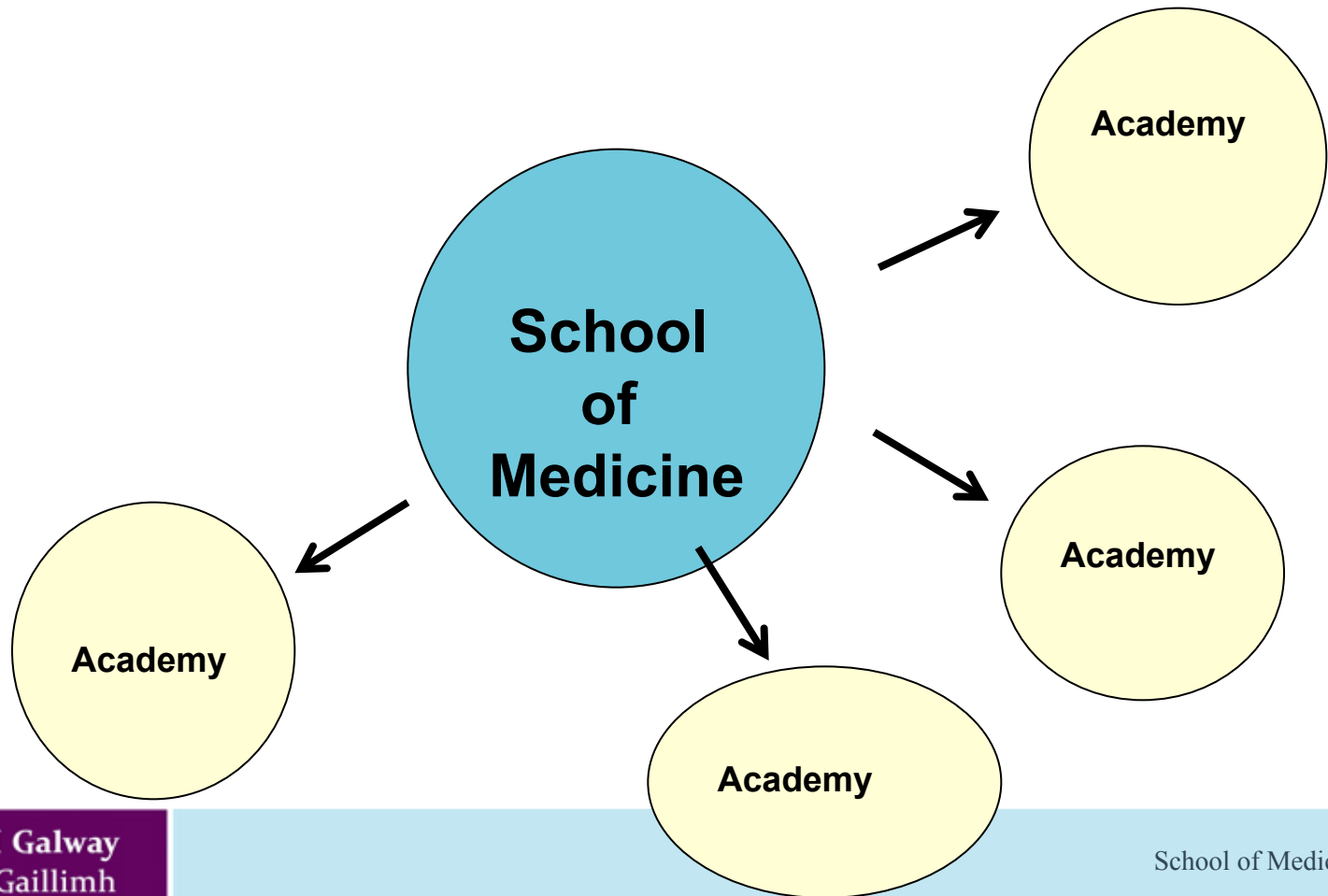
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And
GUH



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Changing the Relationship with the Centre



Context 2. Pre-Academic Simplification

Year 3						Exam Block	Resp: Peri-op & critical care	Acute care	Gastro.	Care of the Elderly	Cardiov.	Exam Block	Medical & Surgical Electives	
							Integrated Professionalism (practical ethics, medical law & informatics)							
Year 4	Paediatrics	Obs. & Gynae	General Practice and ENT	Psychiatry	Exam Block	Paediatrics	Obs. & Gynae	GP & ENT	Psychiatry	Y4 SSMs	Exam Block	Medical & Surgical Electives		
Integrated Professionalism (Attitude awareness, Interview skills)						Integrated Professionalism (ethical and medico-legal awareness,)								
Year 5	Acute care	Gastro	Care of the elderly	Resp. Peri-op; and crit. Care	Cardiov.	Exam Block	Neuro. / Ophth.	Cancer studies	MSK studies	Derm. / Plastics	Renal / Urology	Final Exams	Intern shadow	Internship
Integrated Professionalism (practical ethics, medical law & informatics)						Integrated Professionalism								

Overview of the Clinical Years Curriculum – Pre-Academic Simplification

□



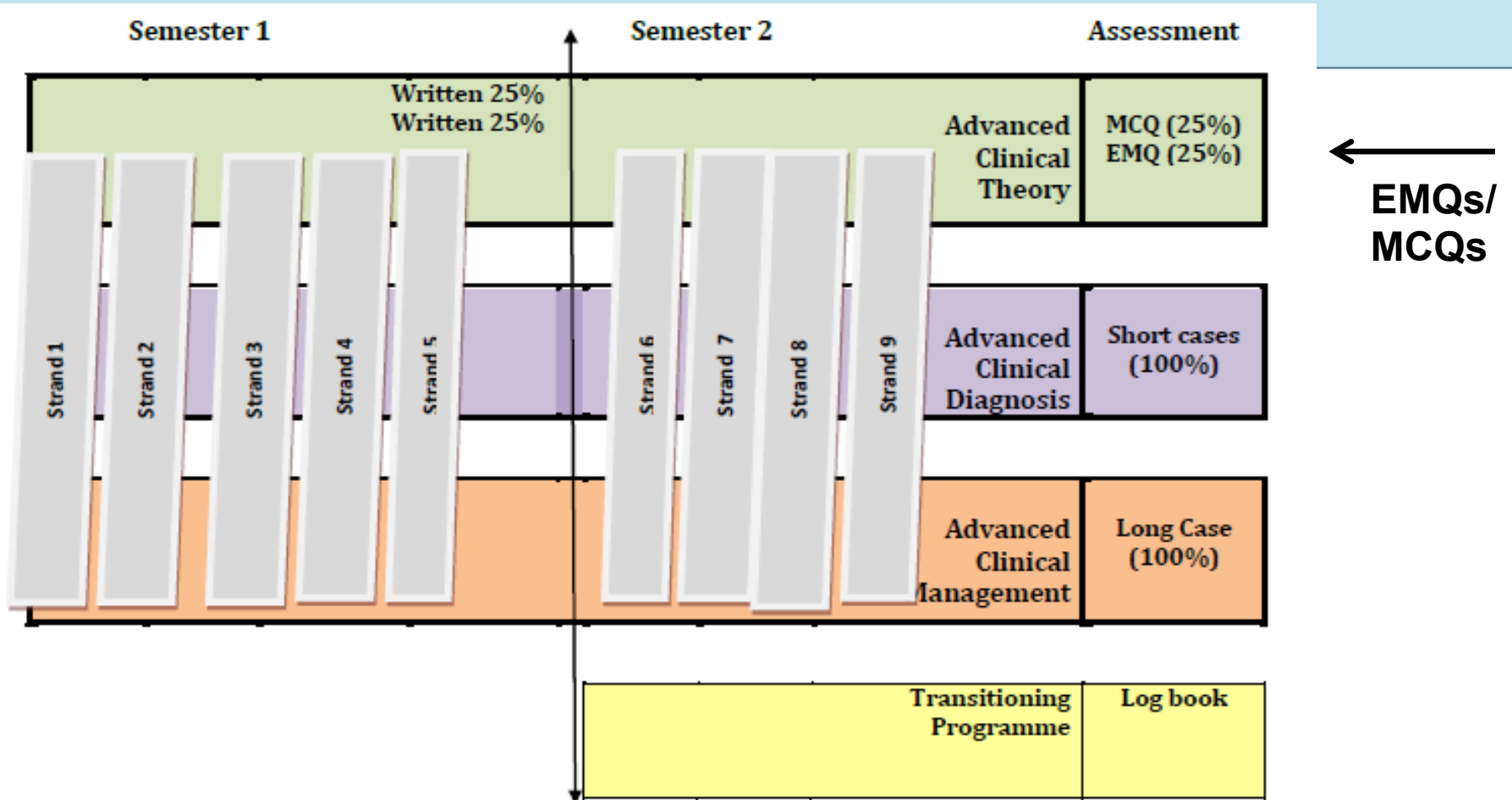
Year 4 – Post-Academic Simplification

Year 4 Modules	
Semester 1	Semester 2
Primary Care and Mental Health (20)	
Women's and Children's Health (20)	
Advanced Clinical Skills (15)	
	Special Study Module (5)

← OSCEs



Year 5 – Post-Academic Simplification



Context 3: Curriculum Mapping Process

MD4xx Women's and Children's Health						ECTS 20												
Module description: The purpose of the WCH module is to provide students with a solid theoretical foundation in the health of women and children, in addition to the recognition and management of maternal or paediatric illness. Whilst the module is primarily delivered in an acute care setting, GPs share antenatal care, are increasingly involved in the care of children with chronic illness and are often the initial source of contact for the sick child or mother. A solid foundation in WCH is highly valued.																		
Learning Outcomes: On successful completion of the module the learner will be able to:						Blueprinting against assessment					Level of proficiency (1-5)	Mapping against 8 programme outcomes A. Significant/explicit contribution B. Implicit/underpinning						
						Written	MCQ	Case report		F: Portfolio /log		1	2	3	4	5	6	7
Weighting %						60	30	10		0								
1	Describe the clinical presentations, epidemiology, aetiology, differential diagnosis and management of common illness presenting in women and children.					x	x	x		x	5	A	B	B	A			B
2	Diagnose, create and justify management plans for common health presentations in the infant, paediatric, obstetric and gynaecological context, which are evidence based and would provide high quality holistic care effectively, within available resources.					x	x			x	4	A	B		A	B	B	B
3	Diagnose and theoretically manage emergency presentations in the infant, paediatric, obstetric and gynaecological context, which is evidence-based and would provide high care effectively.					x	x	x		x	4	A	B	B	A	B	B	B
4	Apply appropriate models of care in the maternal and child health context, in a theoretically informed way, demonstrating a sound knowledge					x	x			x	3	A			A	B	B	B



Research Study



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Goal

To evaluate the effectiveness of **blueprinting** as a means of enhancing **constructive alignment** within the undergraduate medical curriculum.

Research questions:

- To what extent can blueprinting serve as **a tool to aid assessment design**?
- How does blueprinting impact on the **process of curriculum review and/or redesign**?
- How can blueprinting offer **evidence of compliance** with accreditation requirements?



Research Design

Strategy

- Collaborative action research - co-inquiry
- Single site case study

Multiple perspectives and sources

- focus groups
- interviews
- questionnaire
- curriculum documents

Participants.

- Purposeful sampling
- Tutors, Clinicians, Strand leads, Module leads, Head of School



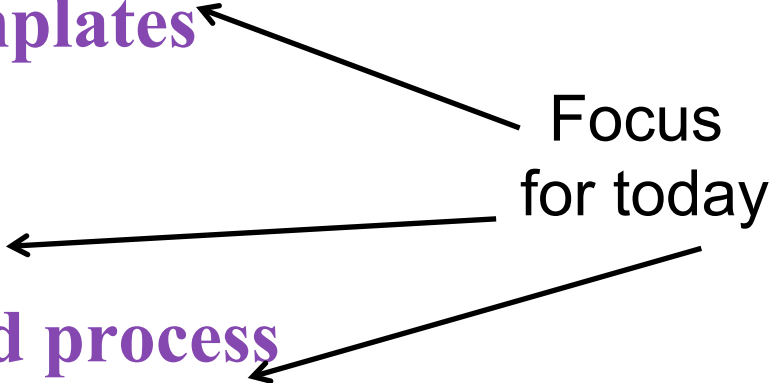
**Ethical Approval
2014-16**



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Process so far

- Mapping the curriculum
 - **Developing assessment templates**
 - Providing CPD to support adoption
 - **Blueprinting assessment**
 - **Reflecting on outcomes and process**
 - Planning next phase
- Focus for today
- 



Blueprinting Assessment

At a number of levels

- **Macro** level - module
 - assessment **techniques** (e.g., MCQ exam, OSCE) and learning outcomes
- **Meso** level – examination
 - assessment **content** (e.g. topics, strands, cases) and learning outcomes
- **Micro** level – item
 - assessment **items** (e.g. questions and stations) and learning outcomes.



Macro level – Module

	Example, adapted from: Women's' and Children's Health (Year 4) Learning Outcomes: On successful completion of the module the learner will be able to:	Blueprinting Assessment			
		Written Examination	MCQ	Case study	F: Portfolio/log
	Weighting %	60	30	10	0
1	Describe the clinical presentations, epidemiology, aetiology, differential diagnosis and management of common illness presenting in women and children.	x	x	x	x
2	Create and justify management plans for common health presentations in the infant, paediatric, obstetric and gynaecological context, which are evidence based, to provide high quality holistic care effectively, within available resources.	x			x
3	Diagnose and manage emergency presentations in the infant, paediatric, obstetric and gynaecological context, which is evidence-based to provide high care effectively.	x	x	x	x
4	Apply appropriate models of care in the maternal and child health context demonstrating a sound knowledge of social and psychological aspects of health and illness	x			x
5	Apply knowledge of principles of health promotion and disease prevention effectively to case presentations in maternal and child health context.	x		x	x
6	Explain current methods of epidemiological data collection and use in the maternal and child health context.	x			x
7	Apply knowledge of the ethical, regulatory and legal frameworks within which the paediatrician and obstetrician/gynaecologist operate, in relation to such issues in their clinical practice.	x	x	x	x
8	Provide evidence of attainment of her/his personal learning objectives as outlined in portfolio at commencement of module.				x



Micro level - Items

Template for
designing and
blueprinting
OSCE Stations

School of Medicine OSCE station template

1.	Module (Year)	
2.	Discipline/s	
3.	Station Reference.	
4.	Station Type	
5.	Scenario	
6.	Interchangeable with	
7.	Duration	
8.	Resources required	
9.	Domain/s Learning outcomes assessed	
10.	Instructions to candidate (posted on door)	-
11.	Instructions to actor/simulated patient	
12.	Instruction to examiner	

Marking criteria (global ratings)

Criteria	Weighting	Guidance for examiner



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Micro level – Items

School of Medicine Template for Writing MCQ (Clinical years)

Template for
designing and
blueprinting **MCQ**
questions

1.	Patient's age and gender		
2.	Site of care		
3.	Chief complaint and nature of onset		
4.	Duration and nature of symptoms		
5.	Pertinent history		
6.	Exam findings		
7.	Results of investigations		
8.	Response to treatment		
9.	Lead-in question:		
10.	Option set (5)	A.	
		B.	
		C.	
		D.	
		E.	
11.	Learning outcome/s		
12.	Content area/strand		

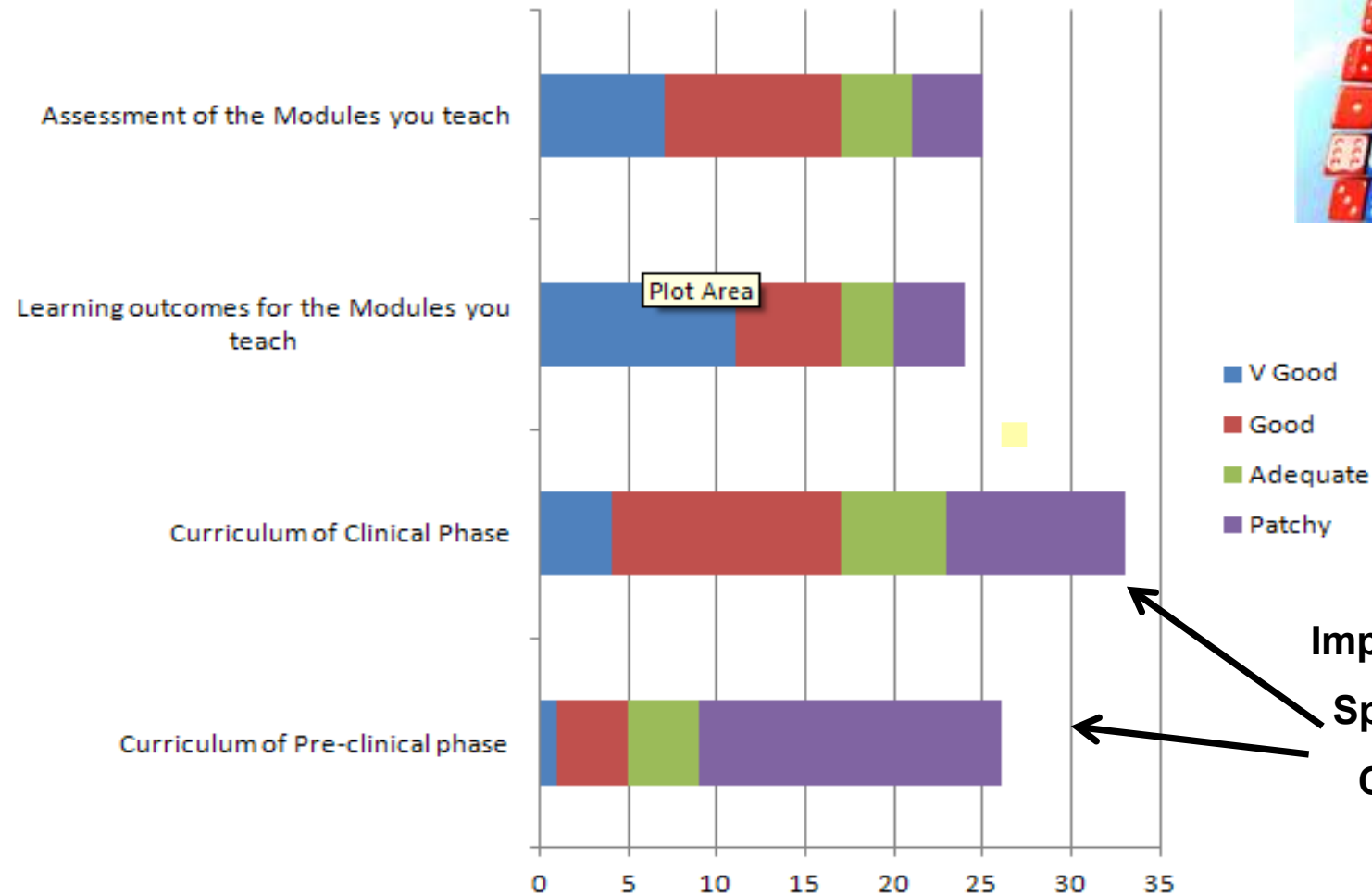


Engaging medical educators as active agents in assessment design

- **‘Tutor Away days’**
 - Overview of curriculum
 - Blueprinting tools
 - Collaborative assessment design
- **Survey of Medical Educators**
 - Familiarity with the curriculum
 - Actual and preferred involvement in assessment
 - Further CPD needs



Rate your familiarity with.....



Implications for
Spiralling the
Curriculum

Collaborative Design of OSCEs

- **Clinicians/tutors** create OSCE stations
 - Blueprint against LO (micro level)
- **Module lead** reviews stations and designs exam:
 - Blueprinting LO/domain (meso level)
 - Sampling content areas



Meso level – blueprinting the examination e.g. an OSCE examination

Designing the Exam: Blueprint Assessment Items (stations) against LO (domains and topics)

Advanced Clinical Skills		Stations Types					
		Emergency	Developmental	Chronic illness	Routine OPD presentations	Evaluation signs	
	Learning Outcomes: On successful completion of the module the learner will be able to:	1	2	3	4	5	
1	Take a history from people of relevant specialties, across a wide range of different scenarios, showing a patient-centred, sensitive, multicultural, structured and thorough approach with demonstration of principles of good communication.	X					
2	Undertake a physical examination /mental state examination that are systems-based; appropriate for patient's age, gender and state of mental and physical health, in a rigorous, sensitive, efficient and systematic manner.	X	X	X			
3	Demonstrate awareness of accepted professional attitude and behaviour with patients, carers and colleagues.	X				X	
4	Evaluate and analyse common investigative test results, and interpret any positive or negative findings therein, and exhibit a further ability to request further appropriate investigations, in the specialty subjects		X		X		
5	Synthesise competently, in the specialist clinical context, all available information gathered from history, examinations and basic investigative testing and formulate a reasonable working diagnosis and differential diagnosis, whilst recognising life threatening conditions that require immediate treatment.			X	X		
6	Explain effectively the diagnosis/ prognosis and agree a management plan with the patient, including reference to appropriate additional sources of expertise and information.			X		X	
	Example of Sampling of Paediatric Topics	Topic/Specialty/ Case of importance = (For demo only)	DVA	Spina Bifida	Cystic fibrosis	Lump in neck	Diabetes



	Stations Name/No.				
GP	History + attitude awareness	Explaining + C skill	Clinical skill + management plan	Clinical skill + Diagnosis/Mgmt	
Domain	1	2	3	4	5
History taking	X	x			
Clinical examination			X		
Communication	X	x	x	x	
Data interpretation				x	
Diagnosis					
Management		x	X	x	

	Stations Name/No.				
PSYCH	History + attitude awareness	Explaining + C skill	Clinical skill + management plan	Clinical skill + Diagnosis/Mgmt	
Domain	1	2	3	4	5
History taking	x	x	x		
Clinical examination	x	x	x		
Communication	X	x	x	x	
Data interpretation				x	
Diagnosis				x	
Management	x	x	x	x	

	Stations Name/No.				
PAEDS	History + communication	Synthesis of information + Management	History/synthesis of Information/ Diagnosis	Clinical skill + Diagnosis /	Clinical Skill (Interpretative)/Dx
Domain	1	2	3	4	5
History taking	X	x	x		
Clinical examination				x	
Communication	X	x	x	x	
Data interpretation					x
Diagnosis		x	x	x	x
Management	x	x		x	x

	Exam + diagnosis	Exam + data + management	Data + management	History + diagnosis/mgmt	History + data + diagnosis
OBGYN	1	2	3	4	5
History taking				X	X
Clinical examination	X	X			
Communication			X	X	X
Data interpretation		X	X		X
Diagnosis	X			X	X
Management		X	X	X	

Outcomes

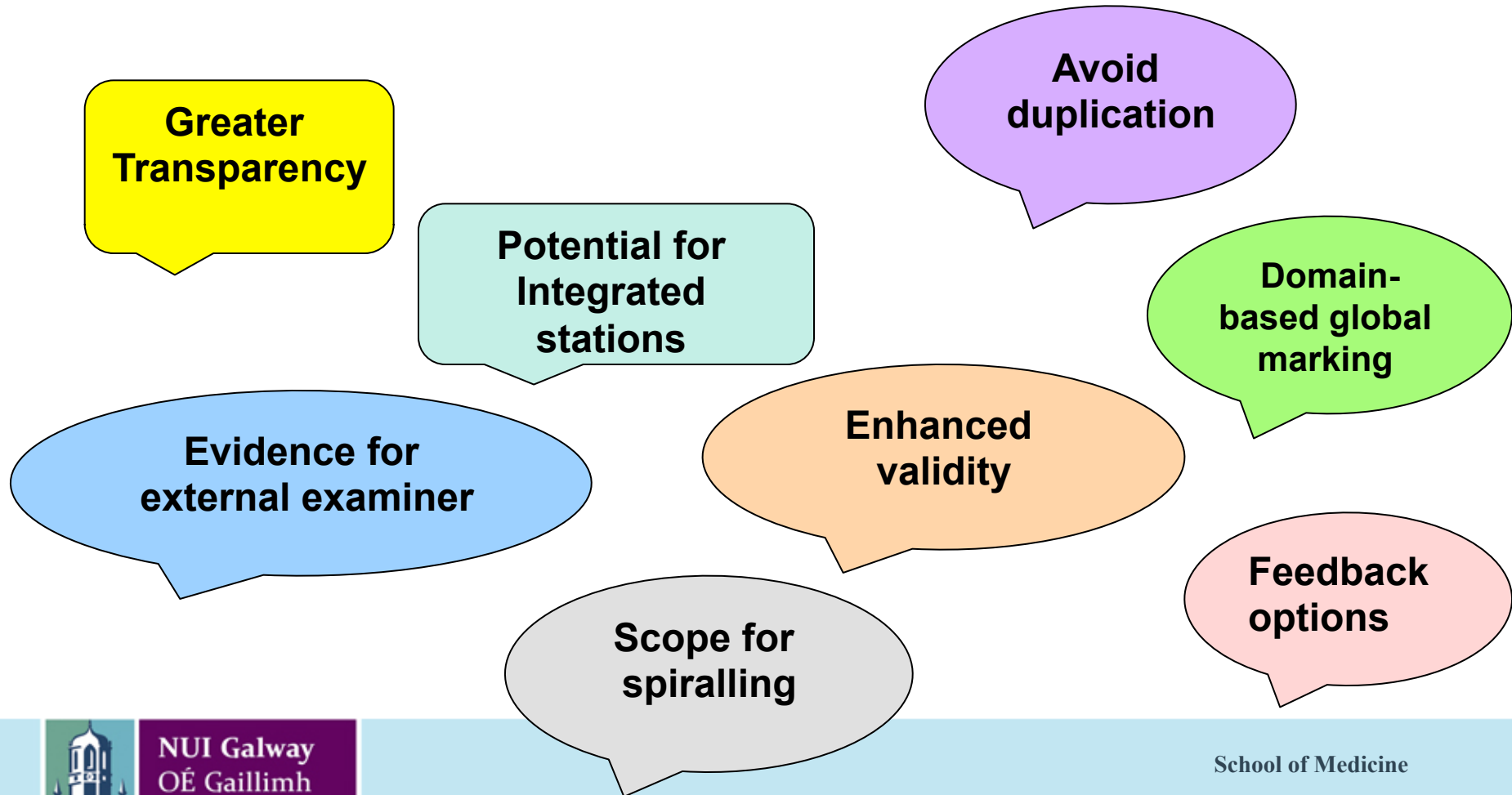


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Outcomes: Some benefits.....

Module leads, clinical years



Reflections 1: The big picture ... language

See the Big Picture

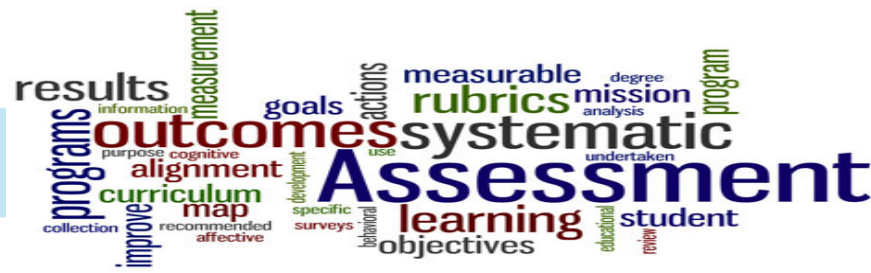


http://blog.creativethink.com/images/2007/06/22/see_the_big_picture_260.gif

The only way they can really [design assessment] is if they **understand the intrinsic nuts and bolts of how the course is designed** . . . It's like a language or a script. When I'm talking about designing OSCEs, I'm talking in a **language**. It's like **Java** – you have to understand Java to be able to get what I'm saying. Because if I send off some emails and ask people to contribute to this, in Java, and nobody understands...



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Reflections 2: The change process

I think it has highlighted issues where we need to change. It probably will happen but it's not going to happen in the next year – too much change unsettles. **We need to let things bed down**

Because you're trying to change and implement at the same time. And sometimes some **change has to be sacrificed as your efforts go into implementing.**

You can change on paper but it's a lot harder to actually change on the ground, **you have to get buy-in.** We have just started this whole process.



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Reflections 3: Getting buy-in

And I think people are willing - I don't think there's huge resistance - willing to have a go at it but it is **the time and effort required...**

I think **if you can get these people together in a room in a workshop** they all absolutely totally engage, enthusiastically, and contribute and query and quiz. It's always been a very successful event for all involved – but actually getting them there...

...if something is **prescriptive it has a negative connotation** – it's more difficult to get people to buy-in... terms [like] 'away days', 'training 'days' - even the name suggests that you need to be remediated!.



Reflections 4: Impact on teaching

I was talking to somebody today about looking at their station, which we are not going to change this year. He felt that really he would have **to implement changes in how he taught his specialty during the year before he could change the assessment of it.** ... To bring in other skills such as data interpretation or writing a prescription. ... and then would be very easy to add on another domain to test, and not just straightforward history-taking.

**Review
Assessment**

**Amend
teaching**

**Change
assessment**



Reflections 5: Blueprinting as a tool – not an end



I think it made us look at our learning outcomes and see where they **link into the Medical Council's** - which is critical.

I think it has really made us stop and think “**what are we actually doing?**” as we bring the students through the curriculum. What kind of person ... [are we graduating]?

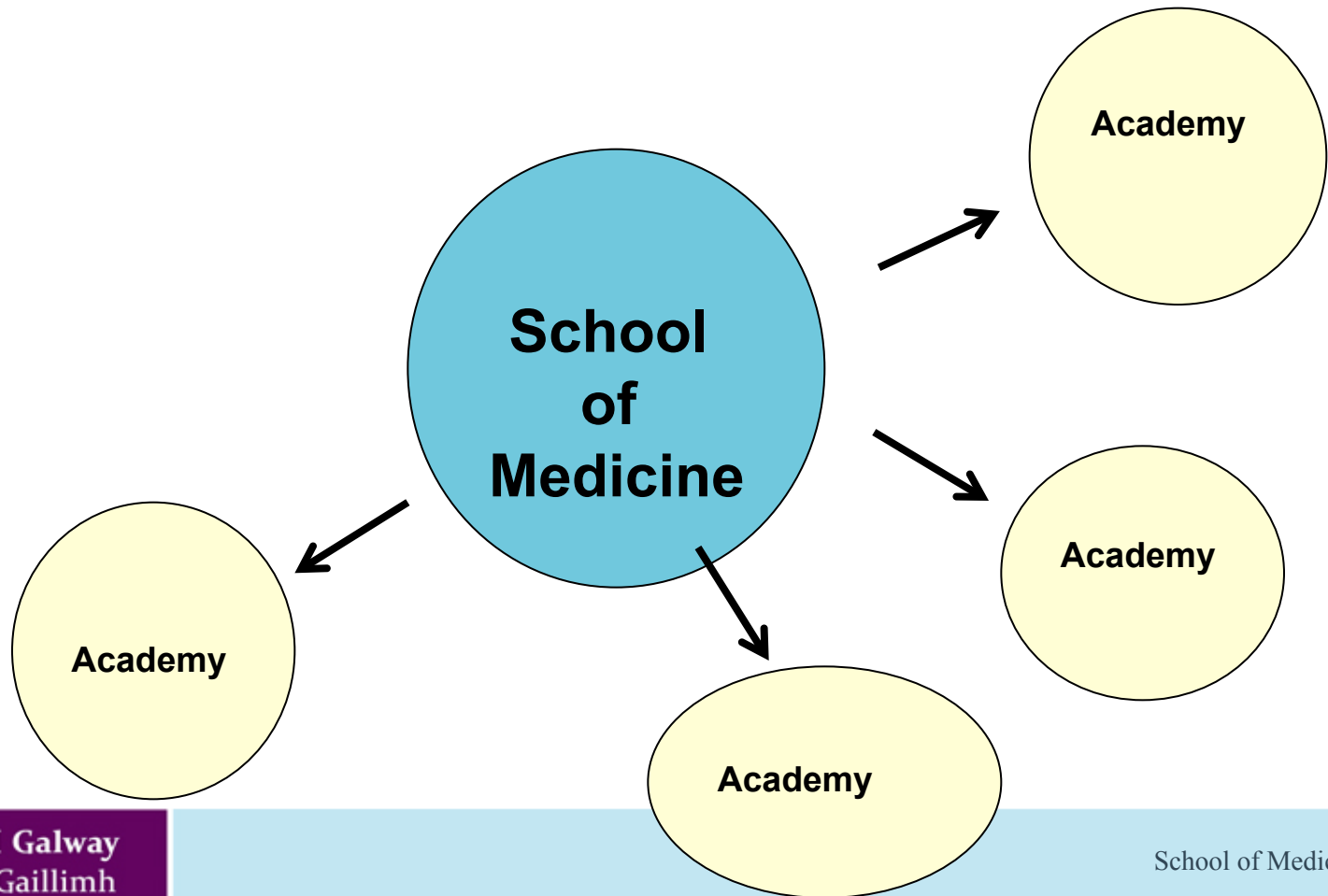


Conclusions

- **To what extent can blueprinting serve as a tool to aid assessment design?** ✓
- **How does the use of assessment blueprinting impact on the process of curriculum review and/or redesign?** ✓
- *How can blueprinting offer evidence of compliance with external examiner and accreditation requirements?* *To find out*

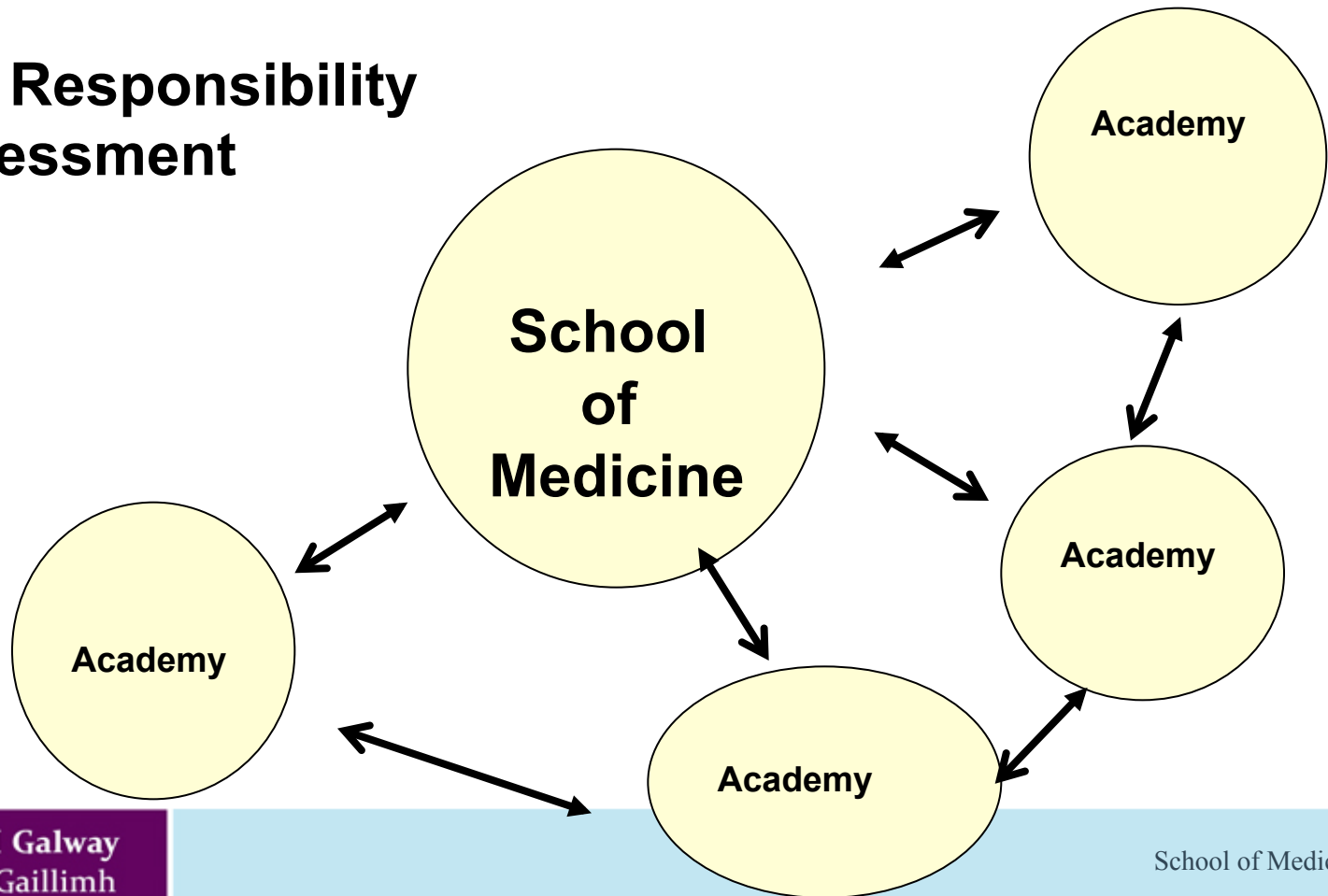


Changing the Relationship with the Centre

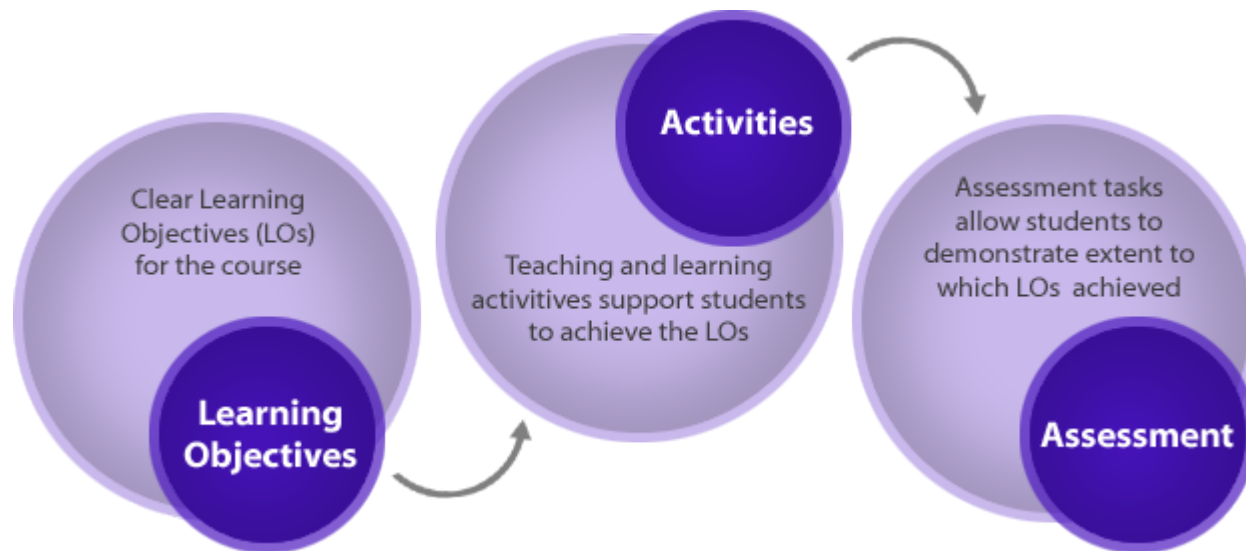


Changing the Relationship with the Centre

Shared Responsibility for Assessment



Blueprinting for constructive alignment



<http://app.griffith.edu.au/assessment-matters/docs/introduction/alignment>



The importance of leadership



Blueprinting Assessment to Enhance Constructive Alignment

Discussion

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Acknowledgment: Irish Research Council funding



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