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43 **Ethical Considerations:** Declaration of Interest:

44 There is no declaration of interest to report.

66 from-and-to assessment; continuous enrichment through rigorous quality assurance;
67 societal sensitivity; influencing others; a 'wow' factor.'

68 **Conclusion:** Although the journeys of the three medical schools were undertaken in
69 different cultural contexts, similar core components highlight strong foundations in
70 student assessment. The journeys continue as assessment programmes remain
71 dynamic and measurement science expands.

72 This article may be helpful to other institutions pursuing excellence in assessment.

73

74 **INTRODUCTION**

75 Assessment of medical student progress is a complex and vital responsibility.
76 Excellence implies that a program of assessment actively promotes learning to achieve
77 curricular objectives and outcomes, guarantees unbiased assessment of student
78 progress, and protects patient safety by ensuring that only students who meet
79 competency standards progress and graduate. The aim of the Aspire-to-Excellence
80 Awards, a flagship initiative of the Association of Medical Education in Europe, is to
81 recognize outstanding performance and promote educational excellence in six areas:
82 Student Assessment, Student engagement in the curriculum, Social accountability,
83 Faculty development, Simulation and Curriculum Development. The Aspire-to-
84 Excellence criteria for each represent best practices (aspire-to-excellence.org), and the
85 applications are peer-reviewed by a panel of international medical educators.

86 In this paper, the journeys of three medical schools towards comprehensive
87 assessment excellence are reported. Each received the ASPIRE Award for Excellence

88 in Student Assessment: Aga Khan University Medical College (AKU-MC), Pakistan,
89 Southern Illinois University School of Medicine (SIUSOM), USA, and University of
90 Leeds School of Medicine, UK. Each operates through different cultures, policies, and
91 environments, which may influence medical school curricula and assessment systems.

92 Since this article was prepared, Sydney Medical School, Australia, has also won the
93 ASPIRE award for assessment excellence, making a total of four schools on four
94 different continents with this award.

95 The journeys detailed here provide a platform to highlight commonalities among the
96 schools despite the contextual differences.

97

98 **AGA KHAN UNIVERSITY MEDICAL COLLEGE: OUR JOURNEY**

99 Aga Khan University (AKU), chartered in 1983, is Pakistan's first private university. It is
100 not-for-profit and has campuses in Pakistan, South-Central Asia, East Africa and the
101 United Kingdom. Its vision is to be an autonomous international institution of distinction,
102 primarily serving the developing world and Muslim societies in innovative, enduring
103 ways. Its mission includes capacity development for exemplary leadership and shaping
104 public policies through international standards, local relevance, access and impact. The
105 medical college offers a five-year undergraduate programme. Its assessment
106 programme starts with Assessment-for-Diversity. This admission test is held in seven
107 cities and ensures equal-opportunity student-access to medical school. The Admission
108 Committee's representation (regulatory bodies, alumni, public, faculty from AKU and
109 other academic institutions) ensures relevance, authenticity and transparency.

110 Previous Associate Deans, Education, CWVellani and J Talati, defined curricular
111 outcomes and established the Department for Educational Development (DED) for
112 health professions education (HPE), which include the Examination Section and
113 Standardised Patient Bank. RWZuberi, third Associate Dean, Education, led a curricular
114 renewal, established a centralized question-bank, initiated a Master's degree in HPE
115 (with its assessment course offered as a stand-alone-course as well), and invested in
116 DED faculty by building assessment expertise through doctoral qualifications in HPE.
117 Prior to that time there were few MHPEs and no PhDs in Medical Education in Pakistan.

118 The Associate Deans, Education, have strong relationships with the Dean, Curriculum
119 Committee, and the Examination and Promotions (E&P) Committee. DED has
120 representation on all educational committees. However, the Examination Section
121 reports only to DED: *assessment talks to the curriculum but does not report to it.*

122 The Assessment Programme was transformed during Curricular Renewal (2002). Its
123 curricular outcomes are aligned to international standards and for local relevance (Table
124 1). Examination blueprints are based on exit level and enabling objectives derived from
125 a faculty-identified AKU List of Common Clinical and Health Problems, cross-checked
126 against national data (NIPS-1986).

127 Integrated spirals of assessment, aligned to spiral longitudinal curricular themes (Davis
128 et al. 2007), ensure all outcomes are assessed throughout the curriculum. Within each
129 spiral, multi-trait, multi-method assessments are matched to enabling course/year
130 objectives, and targeted towards increasing levels of complexity for student progression.

131 National regulatory bodies require individual subject scores, and viva-voce
132 examinations with external examiners. To maintain the ethos of integrated
133 assessments, horizontally-integrated, scenario-based written examination questions are
134 jointly owned by relevant disciplines, and an innovative multi-station, case-based
135 standardised viva-voce basic sciences examination was introduced. Discipline-based
136 results are then extracted for regulatory requirements.

137 Clinical skills assessments start in Year 1 and basic science assessments continue until
138 Year 5. In years 1-2, basic sciences are learned and assessed through clinical vignettes
139 (Zuberi 2011); in Years 3-5, 15% of questions in written examinations assess basic
140 sciences. Regulatory requirements for external examiners are linked to longitudinal
141 integrated assessment by inviting basic science external examiners for clinical viva-
142 voce examinations.

143 Examination frequency was reduced, true/false questions were replaced by one-best-
144 answer formats, and objective structured clinical examinations were introduced as end-
145 of-clerkship examinations, using simulations as needed. The AKU Student Continuous
146 Assessment Form (SCAF) assesses all outcomes with an emphasis on professionalism
147 and ethics. This form was standardized across all clerkships to track longitudinal
148 student progress.

149 Formative examinations were mandated before summative (written or clinical), and mid-
150 module/clerkship scores are used solely to promote learning (Zehra & Sadaf 2012).

151 Face-to-face immediate feedback is provided at each station during the Year1 formative
152 OSCE. After written assessments in years 1-2, anonymous individualised feedback-

153 graphs are provided to students portraying achievement of objectives. Elsewhere
154 feedback is provided via the Learning Management System.

155 To build teams and decrease competition, grades were changed to Honours/Pass/Fail.
156 Student voices on the Curriculum Committee overcame faculty resistance to this
157 change.

158 Both unsuccessful and borderline successful students are counseled; the former are
159 also provided guided remediation before re-examinations. All assessment policies are
160 provided to students and are on the AKU-intranet.

161 Q-Bank re-vitalisation is ensured through item development and multidisciplinary
162 reviews (Sadaf et al. 2012). Pre-hoc and post-hoc reviews (Yousuf et al. 2015) ensure
163 congruence with examination blueprints, fit-for-purpose assessments, appropriate test
164 difficulty, fairness and robustness (Streiner et al. 2014; Naeem et al. 2012).

165 AKU-MC invites external examiners to its Annual Mega-Retreats for Item Review,
166 whereby they contribute authenticity to the examination, but also take back what they
167 learn to improve assessments at their own institutions.

168 Results are approved by an independent E&P Committee, which has student-elected
169 student members. Multi-modal multiple assessments of each outcome by multiple
170 assessors (internal and external) across the curriculum provide multiple sources of
171 defensible validity evidence for outcome achievement, progression and certification.

172 The assessment loop is closed by using student performance-analyses to inform
173 students regarding their achievements; faculty regarding teaching and item

174 effectiveness; the curriculum regarding areas and outcomes that need attention; and
175 academic leaders that AKU-MC produces fit-for-purpose doctors.

176 Feedback regarding assessments obtained from students, faculty members, internal
177 and external examiners, feeds into on-going monitoring and continuous-assessment-
178 and-curricular-renewal (catalytic effect), achieved through layers of internal and external
179 programme reviews (Figure 1).

180 As a ripple effect, AKU residency and Nursing-and-Midwifery programmes in Pakistan
181 and East Africa adopted the question-development-and-review sessions. Nationally,
182 true/false MCQs attained obsolescence, and admission tests became the norm.

183 Regionally, AKU conducts assessment video-linked workshops for the French Medical
184 Institute for Children, Afghanistan. Both pre-and-post Aspire-Award, national and
185 regional medical colleges have regularly requested AKU-MC for formal orientation to
186 their assessment systems. The belief emerged that AKU-faculty were not just cutting
187 stone, they were building a cathedral (Feiner 2004).

188 An 'assessment culture' is nurtured by offering multiple capacity-building pathways for
189 medical education expertise as follows. Level-1 Mandatory Introductory Short Course-
190 HPE: Faculty are introduced to outcome-based assessment, assessment-for-learning
191 and item-development. Level-2: Standard-setting, pre-and-post-hoc sessions provide
192 on-the-job learning, reinforcement, camaraderie and fun. Level-3: Faculty may then
193 pursue additional assessment courses and/or MHPE qualifications. Fifty faculty have
194 done this so far, resulting in several publications on assessment (Bari 2010; Afzal et al.
195 2010; Nadeem et al. 2012; Qureshi and Ali 2013).

196 The “Wow Factor” of innovative assessments in order to keep the ethos of an integrated
197 curriculum to satisfy traditional regulatory requirements, while maintaining multi-trait,
198 multi-method, robust and authentic spiral assessments of all outcomes, with rigorous
199 QA processes, led to a huge national ripple effect. Faculty engagement and
200 empowerment are the chief ingredients of the AKU-recipe.

201

202 **SOUTHERN ILLINOIS UNIVERSITY SCHOOL OF MEDICINE: OUR JOURNEY**

203 Southern Illinois University School of Medicine (SIUSOM) was born in the spirit of
204 innovation. In 1968, the Illinois Board of Higher Education recommended that SIU
205 create a medical school in downstate Illinois to serve the people of central and southern
206 Illinois, and in 1970, SIUSOM named Richard H. Moy, MD, as its inaugural Dean.
207 SIUSOM was the first medical school to establish a complete set of goals and
208 objectives for the medical degree (Curricular Objectives 1976). In 1981, Harold
209 Barrows, MD, was recruited to implement a standardized patient curriculum. The advent
210 of this clinical, simulation-based curriculum paved the way for Reed Williams, PhD,
211 another pioneer in medical education, to develop a rigorous method of assessing
212 medical students in the context of standardized patient encounters (William et al. 1987).
213 He, along with Barrows and other colleagues, developed the first comprehensive clinical
214 performance examination for senior medical students based on standardized patient
215 technology. This method of assessment has since been adopted world-wide. In 1985,
216 SIUSOM added a graduation requirement that all students satisfactorily complete this
217 comprehensive performance-based assessment using standardized patients; it became
218 known as the Senior Clinical Competency Examination (SCCX) (Williams et al. 1987). In

219 2004, Debra Klamen, MD, MHPE, was recruited to SIUSOM as the Associate Dean for
220 Education and Curriculum and Professor and Chair of the Department of Medical
221 Education in an effort to bring further innovations to the medical school. In 2005, she
222 and colleagues developed and initiated a Longitudinal Performance Examination (LPE),
223 aimed at assessing the clinical reasoning of medical students and monitoring its growth
224 over the course of medical school training (Williams et al. 2008). Research by Klamen
225 and Williams led to the development and validation of a diagnostic justification (DXJ)
226 narrative, which was added to the SCCX examination (Williams et al. 2011, Williams
227 and Klamen 2012). The DXJ allowed for a more complete assessment of medical
228 students' ability to organize and use their medical knowledge to guide diagnostic
229 decision-making and defend their diagnosis and clinical thought process. It allows
230 medical educators to identify critical deficiencies in diagnostic reasoning that previously
231 remained undiscovered (Klamen and Williams 2010).

232 SIUSOM continues to use the standardized patient curriculum in all years of medical
233 training to augment clinical education and assessment. In 2014, with support from the
234 Josiah Macy, Jr. Foundation, SIUSOM began the process of revamping clinical
235 clerkships, with the blessing of the Liaison Committee for Medical Education (the
236 accrediting body for North American medical schools). The driver for change was that
237 years of LPE data from multiple schools revealed students' clinical reasoning was
238 paradoxically plateauing during the clinical years. These assessment tools have not
239 only helped guide improvements to the curriculum, but have helped SIUSOM stay on
240 the forefront of medical education. In recognition for these efforts and commitment to

241 assessment and assessment innovation, SIUSOM was awarded the ASPIRE Award for
242 Excellence in Assessment.

243 As part of the Year 3 clinical curriculum reform mentioned previously, lectures and end-
244 of-rotation, multiple choice format exams have been eliminated. The extent of
245 innovation and departure from the traditional third year clerkships provided an
246 organizational challenge, but SIU faculty, at heart, are educational change agents
247 themselves. Student assessment is based primarily on narrative feedback from
248 preceptors with whom they have a longitudinal relationship. SIUSOM developed an On-
249 the-Fly assessment tool that is designed to be completed on a mobile device (e.g. cell
250 phone or tablet). The On-the-Fly form allows preceptors to provide students with
251 specific feedback in real-time.

252 With the intention of providing additional support to medical students, SIUSOM hired
253 eight nurse educators in 2000 who work to coordinate student experiences, and to
254 teach, supervise, and assess medical students. Utilizing the skills of nurse educators,
255 fourth-year medical students entering a surgical specialty have the option to enroll in a
256 Surgical Residency Readiness elective. This elective includes a Mock Page Simulation
257 Program that was developed at SIUSOM and has since been incorporated into the
258 National Curriculum of Resident Preparatory electives (2011). Mock pages are an
259 opportunity to assess medical students' clinical decision-making and interprofessional
260 communication while simultaneously practicing skills that are invaluable as a resident
261 (Boehler et al. 2017; Schwind et al. 2011; and Schwind et al. 2011).

262 At SIU, the Department of Medical Education (DME) is closely tied to the student body.
263 This creates a culture in which students feel invested in their own medical education.
264 This relationship led to the creation of a Medical Education special interest group for
265 students and to the development of a student-led program evaluation effort that is
266 assessing the effectiveness of the recent clerkship curriculum reform. Student program
267 evaluators are learning to assess curriculum experiences via qualitative data inquiry and
268 analysis.

269 While clinical reasoning and performance assessment, as well as extensive student
270 engagement, provide the WOW factor at SIU, a comprehensive assessment program
271 examining all graduation objectives is in place as well. Students, beginning in their first
272 year of medical school, are assessed using multiple choice questions, standardized
273 patients and OSCEs, peer and tutor evaluations (from work in problem-based learning
274 groups), and physician-mentor observation and feedback. Faculty are provided
275 extensive development opportunities through the Academy for Scholarship in Learning.
276 A student progress committee (one for each year of medical school) is charged with
277 ensuring the reliability and validity of all examinations. Research in medical education is
278 a strength as well, with over 100 articles about assessment having been written to date.
279 The effect of receiving an APIRE award was very significant (Cianciolo et al, 2017).

280

281 **University of Leeds, School of Medicine: Our Journey**

282 The School of Medicine at the University of Leeds was established in 1831 and is
283 recognized as an international centre for teaching and research excellence in medical
284 education. The School's aim is to translate research into healthcare practice, to

285 educate future scientific and clinical leaders and to narrow health inequalities, locally
286 and globally. The University of Leeds Medical degree (MChB) is a 5 year
287 undergraduate programme which utilises a range of evidence-based approaches to
288 learning and teaching including self, group and technology-enhanced learning methods.
289 High levels of integration and case-based learning, using a spiral and iterative approach
290 to the curriculum, enable students to assimilate their learning effectively throughout the
291 programme. The MChB programme incorporates vertical strands which run through
292 the curriculum encompassing Innovation, Development, Enterprise, Leadership and
293 Safety (IDEALS). In addition, the Campus to Clinic vertical strand, based almost entirely
294 in the workplace, develops clinical skills, awareness of patient safety measures,
295 professionalism and clinical decision-making. Distinctiveness is demonstrated through
296 our educational philosophy, core values, and innovative delivery and assessment of the
297 curriculum.

298 The school's principle objective is to provide doctors prepared for medicine in the
299 twenty-first century, based on standards described for the UK in the General Medical
300 Council's strategy 'Tomorrow's Doctors.' As a consequence, assessment is at the heart
301 of the curriculum with the philosophy 'less-is-better' at the core. The amount of graded
302 summative assessments have been reduced and the number of formative assessments
303 for learning (AFL), with a focus on rich, detailed feedback, have been increased. Post-
304 Aspire award the development of AFL has been a key component of programmatic
305 assessment whereby formative, continuous assessment is designed to maximize
306 student development and promote and encourage continuous learning, self-reflection
307 and personal development. These are skills that are essential within the dynamic

308 profession of medicine. A key component of this is the use and development of
309 workplace based assessments (WBA) within the MBChB mobile curriculum (Fuller and
310 Joynes, 2014). This is particularly important as feedback continues to remain an area of
311 challenge in academic study. As part of a faculty-wide initiative of 'focus on feedback'
312 (FOF), the medical school is striving to develop assessments that generate, and have
313 impact on, quality feedback. This initiative has impacted all areas of assessment and
314 there is a drive towards personalized assessment and feedback for learners. Post-
315 Aspire, University of Leeds School of Medicine has revised and improved the feedback
316 students receive, particularly in the OSCEs and WBAs. The school has moved away
317 from quantifying performance feedback and focused on personalized, actionable
318 narratives. The structure of the feedback forms were produced using a co-design
319 approach with staff and students, as well as the careful consideration of cognitive load
320 principles.

321 High stakes summative examinations continue to be a measure of progression; it is
322 therefore essential to ensure that they are authentic and of extremely high quality. In-
323 house research has looked into this extensively pre- and post-ASPIRE award,
324 particularly in improving standards in knowledge examinations. An example of this is the
325 use of Rasch methodology (Homer et al. 2012). Ensuring that assessments are
326 authentic is highlighted within OSCEs by the inclusion of children as simulated patients
327 during paediatric assessments (Darling and Bardgett 2013).The streamlining of the
328 assessment model, and reduction of summative assessments, is evidenced in the move
329 to a sequential testing model for clinical performance and knowledge assessments (Pell
330 et al. 2013). The delivery of such high stakes testing ensures rigor, fairness and

331 reliability; this is essential in the identification and decision-making in respect to
332 students in the critical pass/ fail region. The move to a sequential testing format sought
333 to address such issues by using a sound theoretical approach, which allowed for an
334 altered test format to be used across a range of domains, carefully implemented into the
335 curriculum. This approach has led to the development of detailed quality metrics that
336 have informed curriculum delivery and assessment models (Pell et al. 2010).

337 In terms of innovation, evaluation, and scholarly activity there is a long-standing
338 programme of continuous improvement to assessments based on current literature and
339 the medical school's research. Over the last decade, our international reputation in this
340 area has grown. Ensuring that programmatic assessment is fair, defensible, and
341 authentic and involves a careful selection of assessment formats that align to learning
342 and curriculum outcomes is paramount. The core principles of continued quality
343 improvement and outcome-based learning are essential as we continue to adopt
344 research-led assessment strategies and development. This has progressed to involve
345 continued longitudinal student profiling, development and review of assessment metrics
346 and improvement in the quality of assessments (Homer and Darling 2016; Homer et al.
347 2017). This research has focused on a wide range of issues, such as standard setting,
348 managing assessor judgements (Fuller et al. 2016) and the disparity between OSCE
349 checklists and global grades (Pell et al. 2015).

350 At Leeds, there is a focus on innovation in assessment practice in the pursuit of
351 excellence, as demonstrated by implementing innovative assessment processes. The
352 school is responsive to societal needs, both locally and globally, and rigorous
353 assessment ensures that only those who reach academic and professional standards

354 graduate. Secondary to this, employers, students and stakeholders recognize success
355 in assessment as a signal for career readiness. Leeds's processes are refined and cost
356 effective, the data are clear, there is evidenced utility and transparent purpose that is
357 continuously evolving. The involvement, and continuous communication, of a wide
358 range of stakeholders (including the National Health Service, employers, local
359 placement providers and external examiners) in curriculum and assessment
360 development is an extremely strong and important feature of the assessment strategy.
361 Research-directed assessment strategies are developed iteratively and are based on
362 both world-leading external scholarship and internationally recognized in-house
363 empirical research which provides the WOW factor in assessment at Leeds.

364

365 **Methods: Steps of Comparison**

366 The three medical schools wrote their own independent journeys and identified the
367 highlights of their journeys.

368 The journeys were compared in three steps. 1. The cultural contexts, historical
369 development of assessment excellence, assessment practices and their rigour, and the
370 highlights of the journeys were compared. 2. Evidence-based concepts and themes of
371 good assessment common to all three were extracted. 3. Some concepts common to all
372 three medical schools, but not found in literature, were also highlighted.

373 Based on these comparisons, the key cultural contextual differences and the common
374 key essential elements were identified and are given below. The key commonalities in

375 the three journeys formed the basis of constructing a profile of a medical school with
376 assessment excellence.

377

378 **Results:**

379 Each of the unfolding journeys had their own frameworks and attained the key elements
380 of the common framework in their own sequence and in their own time-frames.

381 **Key Contextual Differences:**

382 Four main contextual differences were identified (Table 2). Pakistan is an eastern
383 developing country, with a traditional national regulatory body, and university certifying
384 examinations; USA is a western developed country, with progressive national regulatory
385 bodies and national certifying and licensing examinations; while the UK is a western
386 developed country, with progressive regulatory bodies, but has institutional certifying
387 examinations.

388 **Key Commonalities:**

389 Twelve essential concepts of good assessment were found to be common to all three
390 journeys (Table 3): alignment with institutional vision, sustained assessment leadership;
391 stakeholder-engagement; communication between curriculum and assessment;
392 assessment-for-learning and feedback; longitudinal student profiling of outcome-
393 achievement; assessment rigour and robustness; 360° feedback from-and-to
394 assessment; continuous enrichment through rigorous quality assurance; societal
395 sensitivity; influencing others; and a specific-to-institution 'wow' factor.'

396

397 **Conclusion:**

398 These journeys show there are no short-cuts to assessment excellence. Each medical
399 school is from a different continent, operates through different contexts, and pursued
400 different pathways in its journey. Yet, each school also pursued on-going iterative self-
401 improvement cycle based on vision, innovations, evidence-based robust and authentic
402 assessment, meticulous attention to quality and wide stakeholder engagement.

403 These commonalities found in the three schools showcase essential themes for
404 assessment excellence. While many commonalities have previously been discussed in
405 the literature, three elements integral to all three journeys are not clearly mentioned
406 there: (1) longitudinal assessment leadership; (2) high level assessment expertise; and
407 (3) high levels of communication between curriculum and assessment. In addition, each
408 had evidence of 'more' than the required Aspire criteria.

409 Their journeys continue as curricula and assessment systems remain dynamic and
410 measurement science expands.

411

412 **Profile of a Medical School with Excellence in Student Assessment**

413 **(Based on the Commonalities found in the Three Schools)**

- 414 1. The medical college curriculum, including its assessment programme, must be
415 aligned to the school's mission and vision (Henning GW).

- 416 2. There must be continued committed leadership and expertise in assessment
417 within a strong department of medical education. This ensures innovation,
418 research and faculty support.
- 419 3. There must be transparent and fair policies, with stakeholder engagement in
420 assessment to ensure a common understanding of what is done and why (van
421 der Vleuten et al. 2015).
- 422 4. There must be evidence of synchrony between those who set assessment
423 programmes and those who run the curriculum, ensuring defined roles and clear
424 communications.
- 425 5. There must be plentiful opportunities for deliberate practice, formative
426 assessments with personalized high quality constructive feedback that promotes
427 student reflection and learning (preferably using adaptive technology), and
428 opportunities for remediation before re-assessment (van der Vleuten et al. 2015).
- 429 6. Also essential is the longitudinal profiling of student engagement and
430 performance via spiral iterative assessments of all outcomes, identifying students
431 and curricular areas that require remediation or modification, respectively (van
432 der Vleuten et al. 2015).
- 433 7. Assessments must provide fair, objective, standardized, multiple, authentic and
434 longitudinal evidence of progressive complexity to ensure defensibility of validity
435 decisions (van der Vleuten et al. 2015).

- 436 8. Assessment must not only provide feedback to students, teachers, assessors
437 and the curriculum – the catalytic effect (Norcini et al. 2011), but also to those
438 who set assessments and the leadership. Assessment programs must be
439 responsive to feedback from students, faculty members, examiners and patients
440 to ensure continuous improvement.
- 441 9. There must be evidence of continuous monitoring and enrichment through
442 rigorous and iterative quality assurance processes.
- 443 10. There must be sensitivity and flexibility in curricula and assessments to meet
444 changing societal and global needs and new emerging themes, to ensure that an
445 exceptional school continues to grow (Boelen and Woollard 2010).
- 446 11. The medical school must demonstrate a ripple effect as its in-house innovations
447 are adopted in other programmes, nationally and/or internationally.
- 448 12. There must be a 'Wow Factor' of cutting-edge assessment practices including
449 assessment innovations, and innovative problem-solving, and/or use of
450 technology. In-house assessment research must be relevant locally and
451 internationally.

452

453

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551

552 **Table 1.**

**Medical Education Outcomes: International, National (PM&DC)
 and Institutional (AKU-MC)**

553

IIME 7 Minimum Requirements	9 Abilities	Outcomes (Dundee)	PM&DC: 7 Star Doctor Proposed	AKU UGME Outcomes / Attributes
554 1. Professionalism (Self directed life long learner, Ethical, Collaborator)	5,6 & 8	9, 11 role of doctors, personal development	V Professional & Role model	Continuous learners, direct & evaluate this activity. Work effectively with colleagues, health teams Ethically and culturally sensitive
555 2. Scientific Knowledge	3 & 4	3Investigations 4 Management 8 Scientific, 10 decision making	II Knowledgeable	Gather, understand & evaluate new knowledge, apply it to health & disease problems --- in the future.
556 3. Communication Skills	1	6	V Role model Professional	Communicate effectively
557 4. Clinical Skills	2	1+ Procedures	I Skillful	Competence in community-based primary clinical care; supervised for hospital care
558 5. Population Health	7	5	III Community health promoter	Primary health care; community based maternal & child care.
559 6. Information management		7	V Role model Professional	Practice evidence-based medicine, using scientific evidence;
560 7. Critical Thinkers	9		IV Critical thinker	Reason critically, make justifiable decisions;
561			VI Researcher	Scientific curiosity, .towards research
			VII Leader	Leadership in societal issues

562 9 Abilities (Smith 1999).

563 Dundee Outcomes (Harden et al. 1999).

564 PM&DC: Pakistan Medical and Dental Council (Revised Curriculum HEC 2010-2011)

565

566 **Table 2. Contextual Differences in the Three Medical Schools awarded**
 567 **the Aspire-to-Excellence Award in Student Assessment**

S#	Contextual Differences	AKU-MC, Pak	SIU-SOM USA	U of Leeds SOM, UK
1.	East-West	East	West	West
2.	Developed versus Developing Country	Developing	Developed	Developed
3.	Regulatory Bodies	Traditional	Progressive	Progressive
4.	Certifying and Licensing Examinations	Institutional	National	Institutional

568 AKU-MC: Aga Khan University Medical College

569 SIUSOM: Southern Illinois University School of Medicine, United States of America

570 U of Leeds SOM: University of Leeds School of Medicine, United Kingdom

571 **Table 3. Commonalities in the Journeys of Three Medical Schools**
 572 **awarded the Aspire-to-Excellence Award in Student Assessment**

S#	Commonalities	AKU- MC, Pak	SIU- SOM USA	U of Leeds SOM, UK
1.	Alignment with Institutional Vision	√	√	√
2.	Continuity in Assessment Expertise & Leadership	√	√	√
3.	Transparent Policies with Stakeholder buy-in	√	√	√
4.	Synchrony between Curriculum & Assessment Developers	√	√	√
5.	Deliberate Practice Assessment for Learning & Feedback	√	√	√
6.	Longitudinal Profiling of Student Achievement	√	√	√
7.	Multiple evidences of authenticity & reliability of examination scores to ensure defensibility of validity decisions	√	√	√
8.	360° Feedback from-and-to Assessment	√	√	√
9.	Rigorous Quality Assurance processes continuously improve & enrich assessment	√	√	√
10.	Sensitivity to societal needs	√	√	√
11.	Catalytic Effect	√	√	√
12.	The “Wow” Factor	√	√	√

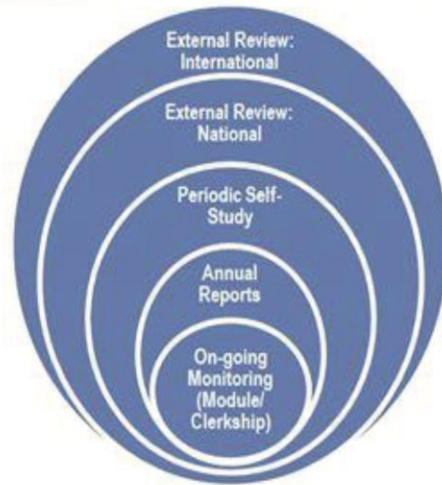
573 AKU-MC: Aga Khan University Medical College

574 SIUSOM: Southern Illinois University School of Medicine, United States of America

575 U of Leeds SOM: University of Leeds School of Medicine, United Kingdom

576

Figure 1. Internal and External Reviews



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