Learning Environment Assessment Tools (Selected Examples) – compiled by Andrea Leep, MD, MHPE (leep.andrea@mayo.edu)

Instrument	Total items, n	Author, Year - Journal	Notes / Comments about Scale Development	Domains / Factors	Subscale Items, n	Cronbach alpha
Medical students						
Educational Climate Inventory (**ECI**)	20	Krupat, 2017 – Academic Medicine	Learning vs. Mastery-Oriented Climate	Centrality of learning and mutual respect	10	0.88
				Competitiveness and stress	6	0.80
				Passive learning and memorization	4	0.71
C-CHANGE Medical Student Survey (**CMSS**)	46	Pololi, 2017 – Academic Psychiatry	Adapted from C-Change Faculty Survey (CFS), which was based on extensive qualitative interviews with faculty about the culture of academic medicine	Vitality	5	0.79
				Self-efficacy in career advancement	4	0.74
				Institutional support	5	0.82
				Relationships/inclusion/trust	6	0.85
				Values alignment	8	0.80
				Ethical/moral distress	8	0.76
				Work-life integration	3	0.77
				Gender equity	3	0.79
				Underrepresented in medicine minority equity	4	0.73
Johns Hopkins Learning Environment Scale (**JHLES**)	28	Shochet, 2015 – Academic Medicine	Emphasizes those aspects of the learning environment that have the biggest impact on students' professional development (based on an earlier study by the same group); informed by social and experiential learning theories	Community of peers	6	0.91
				Faculty relationships	6	0.80
				Academic climate	5	0.86
				Meaningful engagement	4	0.82
				Mentoring	2	0.74
				Inclusion and safety	3	0.58
				Physical space	2	0.66
				Atmosphere	5	0.75
				Organization	5	0.67
Medical Student Safety Attitudes and Professionalism Survey (**MSSAPS**)	28	Liao, 2014 – Academic Medicine	Includes previously published survey items, including the Safety Attitudes Questionnaire, AHRQ Safety Culture survey, others	Safety culture	8	0.89
				Teamwork culture	6	0.81
				Error disclosure culture	4	0.75
				Experiences with professionalism	7	0.87
				Comfort expressing professional concerns	3	0.83

Undergraduate Clinical Education Environment Measure (**UCEEM**)	25	Strand, 2013 – Medical Teacher	Includes modified items from existing tools (DREEM, PHEEM, Learning Climate Questionnaire, Maastricht Clinical Teaching Questionnaire)	Opportunities for learning in and through work	11	0.91
				Preparedness for study entry	6	0.87
				Workplace interaction patterns and student inclusion	6	0.79
				Equal treatment	2	0.84
Climate of Professionalism	46	Quaintance, 2008 – Academic Medicine	Items based on focus groups with students, role-modeling literature, ABIM definition of professionalism	Professional behaviors of students	12	0.82
				Professional behaviors of residents	12	0.75
				Professional behaviors of faculty	12	0.79
				Professionalism teaching	10	0.91
Medical Student Learning Environment Survey (**MSLES**) – Short Form** *Also used in 28 school study by Skochelak, 2016	17	Rosenbaum, 2007 – Academic Medicine Moore-West, 1986 – Res Med Educ	The original MSLES was based in part on the Learning Environment Questionnaire (LEQ) by Rothman, 1970 (a cognitive-affective climate instrument) with additional scales added based on discussions with medical students about their concerns	Breadth of interest	2	0.62
				Student-student interactions	3	0.73
				Student-student interactions – negatively worded items	3	0.52
				Supportiveness	4	0.66
				Meaningful learning experiences	1	N/A
				Organization	3	0.80
				Vertical integration – new item	1	N/A
MSLES – even shorter version	11	Used on AAMC Y2Q	*Cronbach alphas are based on 2017 AAMC Y2Q data	Emotional climate	3	0.90
				Student-student interaction	4	0.80
				Student-faculty interaction	4	0.80
Pololi, 2000 *Strongest validity evidence in Colbert-Getz 2014 review	15	Pololi, 2000 – Teach Learn Med	Survey developed with input from nationally-recognized medical educators; exploratory factor analysis	Teacher-learner relationships	10	0.92-0.93
				Physician-patient relationships	3	0.81-0.94
				Self-efficacy	2	0.83-0.92
Dundee Ready Education Environment Measure (**DREEM**)	50	Roff, 1997 – Medical Teacher	Literature review, Delphi method among 80+ experts; Cronbach alphas from one subsequent psychometric study by Hammond, 2012	Teaching / learning	12	0.78
				Teachers / course organizers	11	0.69
				Academic self-perceptions	8	0.74
				Atmosphere	12	0.56
				Social self-perceptions	7	0.55
Residents						
C-CHANGE Resident Survey (**CRS**)	68	Pololi, 2017 – Journal of General Internal	Adapted from C-CHANGE faculty survey, which was developed based on interviews with faculty and an extensive	Vitality	4	0.84
				Self-efficacy in career advancement	4	0.78
				Institutional support	4	0.85
				Relationships/inclusion/trust	5	0.83

		Medicine	literature search + pilot testing with residents, includes an item for each of the 6 ACGME core competencies	Values alignment	6	0.84
				Ethical/moral distress	8	0.81
				Respect	6	0.82
				Mentoring	6	0.89
				Leadership aspirations	5	0.81
				Work-life integration	3	0.79
				Gender equity	6	0.86
				Underrepresented in med minority equity	5	0.83
				Competencies	6	0.85
Scan of Postgraduate Educational Domains (**SPEED**), abbreviated version	15	Schonrock-Adema, 2015 – PLOS ONE	Items from previous instruments (authors found all items from 12 existing instruments could be mapped to Moos' 3 domains*), Delphi procedure, semi-structured interviews with residents	Goal orientation (content)	5	0.71
				Relationships (atmosphere)	5	0.75
				Organization/regulation	5	0.67
Dutch Residency Educational Climate Test (**D-RECT**)	50	Boor, 2011 – Medical Teacher	Qualitative study, stakeholder input, modified Delphi procedure, exploratory and confirmatory factor analysis, generalizability study	Supervision	3	0.64
				Coaching and assessment	8	0.80
				Feedback	3	0.75
				Teamwork	4	0.69
				Peer collaboration	3	0.76
				Professional relations between attendings	3	0.77
				Work is adapted to residents' competence	4	0.66
				Attending's role (behaviors)	8	0.85
				Formal education	4	0.75
				Role of the specialty tutor	6	0.78
				Patient sign out	4	0.75
				Relationships (atmosphere)	5	0.75
				Organization/regulation (organization)	5	0.67
Postgraduate Hospital Educational Environment Measure (**PHEEM**)	40	Roff, 2005 & Clapham, 2007 – Med Teacher	Literature review, expert input, Delphi-type process, pilot testing	Role autonomy	14	0.92
				Teaching	15	
				Social support	11	
VA Learner Perceptions Survey (**VA LPS**)	57	Keitz, 2003 – Academic Medicine	Literature review, focus groups, pilot testing with factor analysis	Learning environment***	14	
				Clinical faculty	10	
				Working environment	14	
				Physical environment	13	

ACGME Resident and Fellow Survey	29	Holt, 2010 – Academic Medicine	Based on the ACGME Common Program Requirements	Non-duty hours items (i.e., "educational environment")		19	0.80
				Duty hours items		10	0.79
ACGME Clinical Learning Environment Review (**CLER**) focus areas			Some residency programs are using surveys / inventories related to these CLER focus areas as a way to assess the residency learning environment	Patient safety	E.g., Hospital Survey on Patient Safety Culture (HSOPSC) in Bump, 2015 – JGME; Bump, 2017 – Academic Medicine		
				Healthcare quality	E.g., Various quality measures		
				Care transitions	E.g., "Handoffs and Transitions" subscale of the HSOPSC in Bump, 2015 and Bump, 2017 above		
				Supervision	E.g., Resident Supervision Index in Byrne, 2010 – Academic Medicine		
				Well-being	E.g., Maslach Burnout Inventory; see Dyrbye & Shanafelt, 2016 – Medical Education (review)		
				Professionalism –	E.g., Gillespie, 2009 – JGME; Reynolds, 2019 – Curr Probl Pedatr Adolesc Health Care		
High-value care culture survey	24	Gupta, 2017 – BMJ Qual Safety	Literature review, conceptual models for organizational culture, modified Delphi process, exploratory and confirmatory factor analyses	Leadership and health system messaging		17	0.94
				Data transparency and access		2	0.80
				Comfort with cost conversations		3	0.70
				Blame-free environment		2	0.70
Maastricht High-Value Cost-Conscious Care Attitude Questionnaire (MHAQ)	25	Mordang – under review	Items derived from previously published surveys of practicing physicians, focus groups, and literature reviews with input from expert panels.	High-value care		8	0.65
				Cost incorporation		10	0.71
				Potential drawbacks		7	0.67
				Parallel questionnaire developed for residents, staff physicians, administrators, and patients; Cronbach alphas listed here are based on resident respondents.			

* Based on the work of Moos, RH (1973 and 1974) on conceptualization of human psychological environments and social climate scales

**Original MSLES (Marshal, 1978) had 55 items mapped to 7 domains

***Most strongly associated with overall training satisfaction in study by Cannon, 2008 (Academic Medicine), which also included medical students

Exercise 1: Measuring quality outcomes

- What quality measures of the learning environment are already collected at your institution?
- What others could you add?

Pillar	Current outcome measures	Additional outcomes
1. Shared goal of healthcare and health professional education: improving health		
2. Learning is work and work is learning		
3. Collaboration with integration of diverse perspectives		
4. Focus on continuous improvement and innovation		

Exercise 2: Strategy for holistic learning environment assessment at your institution

Refer back to the outcomes identified in the first worksheet, and create a strategy to implement a holistic assessment based on those outcomes. Do this in 2 steps:

1. Using the table below, for each outcome measure consider what instrument/data collection approach you could use, who can collect the data, and who are the stakeholders? Refer to the learning environment instrument inventory for existing instruments but also consider what other data sources could you tap into.
2. Then, decide on how often you would collect and report data, to whom you would report the data, and how you envision this would translate into quality improvement for your institution's learning environment.

Outcome measure	How are data collected?	By whom?	Who are the stakeholders?

We will collect and report data (frequency) _____

The report will go to _____

As a result of the report we anticipate _____