REPORT OF THE FIRST MEETING OF EXPERTS ON THE AHELO CONTEXTUAL STRAND

This meeting took place in Paris on 24-25 November 2008

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This report presents the conclusions of an expert panel convened by the Organisation for Economic Co-operation and Development (OECD) to provide advice about the contents and construction of a Contextual Strand to support the Feasibility Study for its Assessment of Higher Education Learning Outcomes (AHELO) initiative. The panel met on 24-25 November, 2008 and comprised individuals whose experience and research backgrounds centered on the effects of learning environments and pedagogy on undergraduate student learning, the organisation and governance of national higher education systems and higher education institutions (including quality assurance systems), and labour market and post-graduate outcomes (see Appendix A). This wide range of expertise reflected the scope of the task—to attempt to identify as many relevant areas of context as possible in the light of which to interpret and analyse the generic and discipline-level assessment results that will constitute the main product of AHELO.

The panel organised its assignment into three main tasks. First, it developed a conceptual scheme to organise the work defined in terms of the intersection of three dimensions: the domain of interest (for example, physical and organisational characteristics or educational behaviours and practices), the unit of analysis at which these domains are observed (for example, the academic unit or the individual student), and the specific sources through which evidence about each of these might be collected. This scheme was guided by an implicit set of analytical questions about how the resulting data could be used to analyse and understand assessment results. For its second task, the panel used this scheme to develop a detailed list of topics under each broad domain at each unit of analysis (for example, the motivation and self-confidence of the individual student or the organisational characteristics of an institution or academic unit), then considered the various ways in which relevant evidence might be collected. As its final task, the panel reconsidered the resulting list of topics from the point of view of each potential approach to gathering evidence, and prioritised the topics in terms of relative importance. The panel felt that this last step was particularly important for an enterprise of this magnitude because practicable data-collection instruments will be necessarily limited in size and scope.

The report begins with a section that discusses several general issues about AHELO that members of the panel felt were important from the standpoint of context. Subsequent sections of are based on the task sequence described above.

Background and Major Issues

Background

The expert panel began its work by revisiting the goals of the Contextual Strand as put forward by OECD. These included a) the development of instruments to capture important areas of context relevant to teaching and learning that might affect learning outcomes and, b) the development of appropriate indirect proxy indicators of learning outcomes that might supplement the results of planned direct assessments in transversal (generic) skills, and discipline-specific knowledge and skills in engineering and economics. The panel expected evidence about context to be important to achieving AHELO's ultimate goals in two quite different ways.

First, information about context can be used by HEIs and country leaders to more fully understand and interpret the results of the direct assessments that constitute the core of AHELO. While in most cases, these contextual factors will probably not be used as direct statistical controls for analyzing variation within outcomes measures across settings, they will certainly be helpful in understanding and discussing these variations as stakeholders attempt to benchmark their results. For this use, contextual evidence can be both qualitative and quantitative. Similarly, a limited number of contextual variables will be useful for

disaggregating assessment results. This is expected to be especially important for individual student descriptors that define important population groups, but it may be equally useful in disaggregating results by institutional type or setting. Second, contextual information will be important to researchers at OECD and elsewhere in analyzing potential causal connections between particular elements of curriculum or teaching practice and learning gain among undergraduates. Such studies will require statistical modeling, so the relevant contextual evidence will have to be quantitative, or at least be capable of being coded into discrete categories. Both of these potential uses have already been amply demonstrated through the OECD PISA programme, which features the collection of considerable contextual information at multiple levels of analysis. The PISA work has been widely recognised as contributing to knowledge about the linkages between contextual factors and learning outcomes.

In addition to its use in AHELO itself, contextual information will be useful for institutions in helping them understand and improve their own undergraduate provision. In this case, AHELO results that are comparable across settings (both from the assessments and from the Contextual Strand) can help supplement the potentially rich array of non-comparable local information that is already available to HEIs.

Key Issues Associated with the Contextual Strand

In the light of these anticipated uses, members of the panel wanted to emphasise from the outset both the *importance* of the Contextual Strand to AHELO and the *complexities* involved in collecting data of this kind and relating it to learning outcomes. Countries differ markedly in such matters as how their higher education systems are organised, what subjects are taught in what order, the balance between research and instructional activities, and the population proportions and characteristics of students participating in tertiary education. Within countries, differences among HEIs—as well as among programmes and academic units where most of the critical contextual factors affecting teaching and learning are located—may be even more substantial. This will frequently imply that observed differences in assessment results across institutions may be more attributable to differences in context than to variations in the quality of teaching and learning provision. Similarly, it may mean that equivalent levels of learning achievement within a given outcome area are attained in different ways. Both of these situations will radically affect the utility of AHELO assessment results for cross-institutional benchmarking.

Although countries participating in AHELO will quite naturally be focused on the importance of the two assessment Strands, the panel believes that participants must realise the equally critical *importance* of contextual information for rendering assessment data meaningful. The panel therefore commends the OECD Education Directorate's decision not to pursue the Contextual Strand as a "stand-alone" effort in the Feasibility Study. Gathering such information should be a part of *every* AHELO assessment exercise and, to ensure their full cooperation in data collection, participating countries and institutions should be fully briefed about the reasons why this is desirable.

With regard to *complexities*, we have some broader concerns to express. First, the sheer number of potential variables of interest in the Contextual Strand is far beyond the capacity of the Feasibility Study to address. Choices will therefore have to be made to restrict the number of contextual elements for which data are actually collected. Project budgets are limited and, more important, workable instruments for collecting these data require a limited scope and response time. This means that a large number of potentially useful elements of contextual information will necessarily be left out.

Second, the panel is concerned that overly-rigid distinctions might be drawn between the domains of the five Feasibility Study Strands. As one of its members observed, "using outcomes data that [cannot be connected] to process improvement of teaching and learning is meaningless; this also means that [collecting] process data that does not have an impact on outcomes is useless." This statement reinforces the fact that contextual data about teaching and learning practices is at the heart of AHELO and deserves

significant investment and attention: these are not just "control variables." It also implies that the primary basis upon which to choose variables from many potential contextual areas should be the extent to which such items are expected to affect learning outcomes and learning gain, based on previous experience and research.

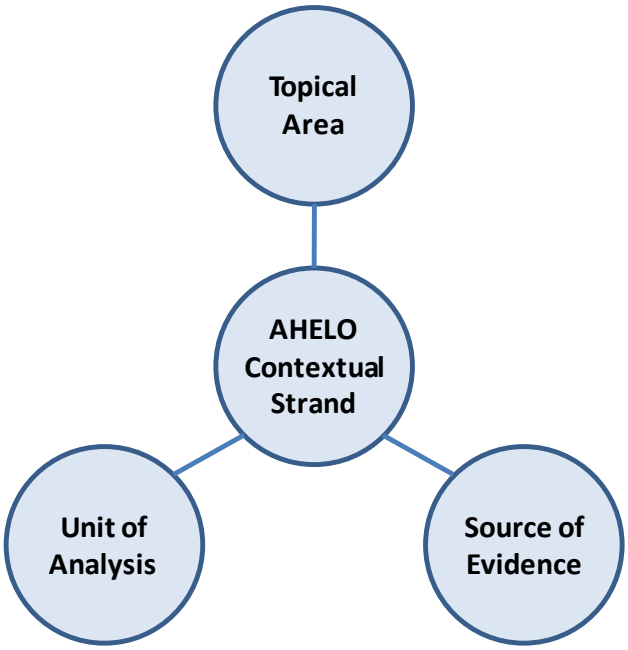
Third, the panel is cautious about the premise that transversal ("generic") skills are entirely different from discipline-specific mastery in fields like economics and chemistry. Some of the outcomes of disciplinary study may well be generic and past research has frequently shown the efficacy (indeed superiority) of professional training for developing problem-solving abilities (Stark and Lowther 1986, Pascarella and Terenzini 1991, 2005). This may be especially the case for abilities that will contribute to future job performance. The panel therefore strongly recommends that the generic skills and disciplinary assessments be administered to the same student respondents at a reasonable number of institutions in a reasonable number of countries.

With generic and discipline-specific results for the same individuals in hand, it will be possible to begin to determine what information each assessment Strand contributes uniquely, to what extent the two assessments capture the same underlying competencies (if, for example, a portion of discipline-specific performance is attributable to generic skills such as critical thinking or problem solving), and to what extent these relationships may vary across institutions or countries. The panel therefore believes that the ideal sampling strategy for all institutions participating in AHELO should include a) participation in at least one Discipline Strand, b) participation in the Generic Strand and administering the generic assessment to an oversample of the discipline selected as well as a representative sample of students across the institution and, c) collection of all the recommended data in the Contextual Strand. This may result in greater complexity and institutional burden in the Feasibility Study than originally anticipated. But fuller understanding of the relationships among the learning outcomes Strands—as well as those between the two outcomes Strands and a broad range of contextual factors—may allow the operational stage of AHELO to be implemented more efficiently because overlaps between the two assessments can be eliminated. The ultimate result will be greater understanding with less ambiguity and less institutional burden.

Conceptual Approach

Recognizing that the Contextual Strand could potentially embrace hundreds of potential topics and dozens of possible ways to gather evidence, the expert panel adopted a three-part conceptual approach to organise its discussion (see Figure 1).

Figure 1. Conceptual Approach



Units of Analysis

Units of Analysis is defined as the level to which data on context refer. This component has five sub-headings:

- ***National System of Instruction*** refers to the country context within which teaching and learning takes place. This includes the organisation of curricula, the relative emphasis between the development of generic and disciplinary skills emphasised at different levels (*e.g.* secondary *vs.* tertiary), and various cultural characteristics of the country in question.

- ***Institution*** refers to characteristics of the particular HEIs participating in AHELO including physical attributes, relevant cultural or value orientations, and specific teaching and learning behaviours.

- ***Academic Unit*** refers to similar characteristics of the specific engineering or economics department or programme participating in AHELO.

- ***Individual Student*** refers to attributes of individual students enrolled in the academic unit or institution participating in AHELO.[1]

[1] The panel acknowledges that "students" at minimum refers to the individual students who complete AHELO assessments, who will also complete a short background survey. But consideration might also be given to administering parallel short surveys to wider samples of students enrolled at the participating institution or academic unit in order to obtain more comprehensive estimates of typical student characteristics and behaviours.

Topical Areas

Topical Area refers to the substance of the variables being discussed. This component has four sub-headings:

- ***Physical and Organisational Characteristics*** comprise observable attributes of the entity in question for example, enrolment size for institutions or gender for individual students. Variables under this heading are included both because they are expected to have an impact on undergraduate student learning and because they might prove to be useful in disaggregating assessment results.

- ***Education-Related Behaviours and Practices*** comprise specific learning-related attributes of the institutional or academic unit setting, the immediate teaching/learning "micro-environment," or identifiable student behaviours that research suggests are associated with student learning and learning gain.

- ***Psycho-Social and Cultural Attributes*** comprise less tangible cultural and value elements of the institutional or academic unit setting or attitudinal factors such as student motivation that are likely to affect student learning and learning gain.

- ***Outcomes*** address the results of undergraduate instruction. The principal result relevant to AHELO is assessed student learning in generic skills and the two disciplines, which is beyond the scope of the Contextual Strand. But many other outcomes that should be considered fall within the Contextual Strand. One cluster consists of behavioural outcomes like persistence and degree completion at the institutional or programme level, or job placement and graduate school attendance for programme graduates. Attitudinal outcomes like student satisfaction or improved self-confidence and identification with the discipline or profession constitute a second cluster. A final cluster comprises self-reported learning gains claimed by students or their instructors. All of these can be considered indirect proxy indicators of student learning that can be used to supplement direct assessment results.

Source of Evidence

Source of Evidence addresses the means through which data on context might be collected. This component has six sub-headings, four of which are expected to be developed immediately for use in the Feasibility Study and two of which are expected to be developed later for use in the operational AHELO programme.

Sources of Evidence to be Developed in the Short Term for the Feasibility Study

- ***Existing Documentation*** includes readily available public statistics and previously compiled research studies about specific national or institutional contexts. It may also cover background knowledge about the structure or conduct of a particular higher education system that is "taken for granted" by its members, such as the balance between teaching generic and disciplinary skills at a given level of education or the relative value placed on advanced graduate study or on particular disciplines.

- ***The Institutional Leadership Survey*** is intended to pose broad questions about context to institutional leaders. Respondents should comprise the Chief Executive and a designated leadership team made up of individuals with specific defined leadership functions such as academic and student affairs. Multiple responses could be aggregated through a technique like

Delphi[2]. While limiting the length of the resulting instrument is important, there is some latitude in posing a substantial number of questions. It might be desirable to use a combination of forced choice and open ended items in this survey, or create a mechanism for project personnel to interact with respondents through email or interview to elaborate upon provided answers.

- ***Academic Leadership Surveys*** are also intended to pose broad questions about context, but at the academic unit level. Because of probable differences in the relevance of particular contextual factors across disciplines, separate surveys for engineering and economics should be considered. In contrast to the Institutional Leadership Survey, a single response from the Dean or academic unit head should be sufficient. Like the Institutional Leadership survey, however, there is a good deal of latitude regarding the number of items, and items should be constructed in both forced-choice and open-ended modes.

- ***Faculty-Staff Surveys*** are intended to pose questions about classroom and discipline context, and should be especially focused on the teaching/learning process. This survey should be relatively short and easy to complete (*e.g.* forced-choice items with room to comment).

- ***The Student Survey*** should focus on educationally-related behaviours and self-reported outcomes. It will, at minimum, be administered with the assessments themselves, though consideration should be given to administering it to wider student samples at participating institutions and academic units. Therefore, it should be short and easy to complete (no more than 20 minutes duration).

Longer Term Sources for Development

Alumni Surveys should be focused on reporting about subsequent outcomes with respect to further education and employment. They could also be used to help confirm results of the student survey and to explore student satisfaction. Consistent with current alumni research practices in Japan, Europe, and the U.S., this survey should be administered approximately three to five years after programme completion. If more recent outcomes are to be considered, the survey should be administered one to two years after completion of studies, as in Australia. Because some of the respondents to such surveys will be engaged in graduate study, there is an opportunity to ask them about their current role in teaching undergraduates and/or their preparation for future undergraduate teaching as a part of their graduate programme.

Employer Feedback. The specific mechanism for obtaining employer feedback is still unclear, but might include surveys or interviews with employers of programme graduates. Topics might include demand for graduate talent, desired or required skill sets for potential employees, and local economic conditions. Construction of this data-gathering approach must recognise a) that most institutional-labour market interactions are local or regional rather than national and, b) that employers may not be able to distinguish among the performances of graduates of particular institutions. Experience suggests that the difficulties of collecting such information from employers are substantial.

[2] The Delphi Method is a technique commonly used in social sciences to aggregate multiple responses from a group of respondents into a single answer through an iterative process. The method begins with a series of first round questions asked individually of experts. The results of the first round judgments are then tabulated and sent back to the experts for re-evaluation of their original judgments in light of the average estimates calculated in the first round. This procedure of re-evaluation is continued until a fairly high degree of consensus is reached.

Analytical Questions

The ultimate object of this conceptual approach was to identify clusters of variables that might be used to address a range of analytical questions about various types of contexts, how they are potentially related to assessed outcomes and to one another, and how these relationships might be used to make sense of assessment results. Among the most important of these analytical questions are:

- *How much variation across contexts is actually present at each unit of analysis*? Addressing this question will be useful in simply setting a baseline for the effort that will be required to benchmark assessment results across national, institutional, and academic unit contexts.

- *How much variation within contexts is present at each unit of analysis*? Addressing this question will be useful in tempering any unitary conclusions about learning environments and student behaviours for specific academic units or institutions based on central-tendency measures. Past research has indicated a good deal more within-context variations in these factors than between-context variations (*e.g.* Kuh *et.al.* 2005).

- *How "clustered" are these variations in terms of being associated with one another?* This question essentially asks the degree to which variations in context at one unit of analysis correlate with similar variations at another. For example, are the characteristics of highly elite national systems associated with similar characteristics in leading academic units? If a good deal of such "clustering" occurs, it may be possible to eliminate some redundancies in collecting similar information in parallel at different levels of analysis.

- *Are some units of analysis so distant from actual teaching and learning settings that they can be safely omitted from detailed analyses of context?* Certainly, broad differences in structure and culture across national higher education systems will need to be documented and described, both to orient users of AHELO results and to provide reassurance that AHELO's designers are aware of them. But they may prove so far from the factors that shape actual learning environments that contextual factors at these more encompassing levels of analysis do not need to be analysed in detail in the future.

- *Which contextual factors at the academic unit level should be given priority for further development in the operational phase of AHELO because they are critical for understanding and disaggregating assessment results?* Although establishing causal relationships between particular contextual factors and assessed student learning is beyond the scope of AHELO, one objective of collecting information about context is to help benchmark results across situations that are clearly different. Not recognizing the impact of such differences could lead to flawed comparisons and improper inferences about respective levels of performance.

- *Which contextual factors that address differences in individual student behaviours within the same academic unit should be given similar priority for further development?* The logic here is similar to the above.

- *Are the same contextual factors important in understanding or disaggregating generic skills results as examining disciplinary outcomes?* Similarly, any important differences in such factors in understanding outcomes between engineering and economics should be investigated and reported.

- *Which of the above factors are most amenable to institutional or academic unit action to change or improve?* As its organisational location within OECD's Institutional Management in Higher

Education (IMHE) programme emphasises, a major goal of AHELO is to help institutions improve their own performance. As a result, the relative manipulability of particular areas of context, once they have been established as important, is a significant factor in deciding which topics to pursue. Indeed, the identification of factors that help institutions to improve may constitute one of the most important incentives for institutions and academic units to participate in the Feasibility Study.

- *Which contextual factors should be given priority in more fully-developed research designs that might be applied to AHELO data as the project matures?* Because of the richness of the potential datasets eventually produced by AHELO, consideration should be given to how these datasets can be more fully harnessed by the international academic research community—especially in more focused studies of international studies of student achievement.

Broad analytical questions such as these provide some guidance in developing and prioritizing what particular contextual topics AHELO might pursue.

Identifying Contextual Topics in Detail

The expert panel spent the bulk of its time using this conceptual approach to define clusters of specific topics that might guide the subsequent development of detailed data collection protocols and surveys. These topics are at a middle range of specification with respect to detail—particular enough to delineate a recognizable attribute or action, but not at the level of a measured variable. For each topic, the panel determined the most promising ways in which evidence might be generated. Finally, the panel determined the extent to which the topic was amenable to conversion to a quantitative indicator that might be used for statistical analysis or, in contrast, the evidence remained principally qualitative.

The results of this exercise are shown in Table 1. This table names each topic under each broad topical area and each unit of analysis. The column immediately to the right notes whether or not the topic might yield a quantitative indicator (QI), might produce largely qualitative data that could possibly be converted to numeric data through the application of rubrics or scoring guides (CQ), or will necessarily yield only qualitative commentary (CO). The columns that follow to the right indicate potential sources of data for this topic area including existing documentation, leadership surveys, faculty-staff surveys, student surveys, alumni surveys, and employer studies. An "X" entry in any of these columns reflects the panel's judgment that this particular method could be used to collect evidence on this topic, while an "M" entry indicates that this might be possible for specific countries or institutional contexts depending on what data are routinely collected.

Table 1. Types of Measures and Sources of Evidence for Identified Contextual Topics

	Type	Document	Leadership	Faculty	Student	Graduates	Employers
Physical and Organizational Characteristics							
National System of Higher Education							
• Numbers and Types of HEIs	QI	X					
• Volume of Tertiary Study	QI	X					
• Capacity of Tertiary System	QI	X					
• Transition from Secondary to Tertiary	QC	X					
• Transition among Tertiary Institutions	QC	X					
• Import/Export of Tertiary-Level Students	QI	X					
• Student Characteristics	QI	X					
• Funding Patterns for HEIs	QC	X					
• Governance Arrangements for HEIs	CO	X					
• National Quality Assurance System	CO	X					
• Teaching Qualifications Framework	CO	X					
• Generic/Discipline Skills Balance	QC	X					
Institution							
• Type	QI	X	X				
• Size (Enrolment and Faculty)	QI	X	X				
• Student Selectivity	QI	X	X				
• Degree/Discipline Mix	QI	X	X				
• Research Emphasis	QC	M	X	X			
• Environment (*e.g.* Urban/Rural)	QC	X	X				
• Infrastructure/Physical Facilities	QC	M	X	X	X		
• Financial Resources	QC	X	X				
• Student Characteristics	QC	X	X				
• Drop-out/Completion Rates	QI	M	X				
• Teaching Staff Characteristics	QC	M	X	X			
• Teaching Load/Student-Faculty Ratios	QC		X	X	X		
• Autonomy/Decision Latitude	CO		X				
• Teaching Support (*e.g.* T-L Centers)	CO		X	X			
• Quality Assurance System	CO	M	X				
• Industry/Professional Link	CO		X	X			X
Academic Unit							
• Size	QI	X	X				
• Student Selectivity	QI	X	X				
• Research Emphasis/Competitiveness	QC	M	X	X			
• Advanced Study in Field Available	QI	X	X	X	X		
• Curriculum Orientation (Generic Skills)	QC		X	X			X
• Sub-Specializations within Field	QI		X				
• Teaching Load/Student-Faculty Ratios	QC	M	X	X	X		
• Infrastructure/Physical Facilities	QC	M	X	X	X		
• Financial Resources	QC	X	X				
• Student Characteristics	QC	X	X				
• Drop-out/Completion Rates	QI	M	X				
• Teaching Staff Characteristics	QC	M	X	X			
• Teaching Load and Student/Staff Ratios	QC		X	X	X		
• Autonomy/Decision Latitude	CO		X				
• Teaching Support (*e.g.* T-L Centers)	CO		X	X			
• Quality Assurance System	CO	M	X				
• Industry/Professional Link	CO		X	X			X
• Governance Relations with Profession	CO		X	X			

Table 2. Types of Measures and Sources of Evidence for Identified Contextual Topics - Continued

	Type	Document	Leadership	Faculty	Student	Graduates	Employers
Individual Student							
• Demographics	QI	X			X		
• Enrollment Characteristics	QC	M	X	X	X		
• Preparedness	QC	M	X	X	X		
• Knowledge About and Access to Support	QC			X	X		
Education-Related Behaviors and Practices							
National System of Higher Education							
• National Curriculum	QC	X					
• Qualifications Frameworks	QC	X					
• Curriculum Emphasis (Generic Skills)	QC	M	X				
• Teaching Force Characterisics/Sources	QC	M	X	X			
Institution							
• Teaching Culture	QC		X	X			
• Assessment Culture	QC	M	X	X			
• Curriculum Structure	QC	M	X				
• Teaching Modes	QC		X	X	X		
• External Learning Experiences	QC		X		X		
• Academic Challenge	QC		X		X	X	
• Role of Generic Outcomes	QC		X	X	M		
• Role of Teacher Quality in Incentives	QC	M	X				
• Adjunct Faculty Use	QC		X		X		
• Expectations for Teaching Practices	QC		X	X			
• Integration of New Students	QC	M	X		M		
• Student Support Services	QC	M	X		X		
Academic Unit							
• Teaching Culture	QC		X	X			
• Assessment Culture	QC	M	X	X			
• Curriculum Structure	QC	M	X				
• Teaching Modes	QC		X	X	X		
• External Learning Experiences	QC		X		X		
• Academic Challenge	QC		X		X	X	
• Role of Generic Outcomes	QC		X	X	M		
• Role of Teacher Quality in Incentives	QC	M	X				
• Adjunct Faculty Use	QC		X		X		
• Expectations for Teaching Practices	QC		X	X			
• Integration of New Students	QC	M	X		M		
• Student Support Services	QC	M	X		X		
• Orientation Within the Discipline	CO		X	X			
• Emphasis on Applied Work	CO		X	X		X	
• Class Sizes	QC		X	X	X		
• Student-Faculty Interaction	QC			X	X	X	
Student							
• Quality of Effort	QC			X	X		
• Active/Collaborative Learning	QC				X	X	
• Integrative/Reflective Learning	QC				X		
• Perceived Academic Challenge	QC			X	X		
• Prompt and Meaningful Feedback	QC			X	X		
• Clear Sense of Destination	QC		X		X		
• Incentives to Do Well	QC		X		X		
• Quality of Relationships	QC			X	X		
• Experiences with Technology	QC				X		

Table 3. Types of Measures and Sources of Evidence for Identified Contextual Topics - Continued

	Type	Document	Leadership	Faculty	Student	Graduates	Employers
Psycho-Social and Cultural Attributes							
National System of Higher Education							
• Competitiveness and Rankings	CO	M	X				
• Expectations About Participation	CO	M	X				
• Intrinsic Value of Academics	CO	M	X				
• Social Expectations of HEIs	CO	M	X				X
Institution							
• Tradition and Prestige	CO	M	X				X
Academic Unit							
• Prestige/International Reputation	CO		X				X
• Status of Undergraduate Teaching	CO		X	X	X		
• Orietation Toward Student Success	CO		X	X	X		
• Goals/Prioities/Challenges	CO		X				
Student							
• Motivation	QC				X		
• Self-confidence	QC				X		
• Career Expectations	QC				X		
• Motives for Selecting Program	QC				X	M	
• Social Support	QC				X		
• Parental and External Peer Support	QC				X		
Outcomes (Assessed, Self-Reported, Behavioral)							
Institution (subject to data availability)							
• Completion/Persistence Rates	QI	M	X				
• Employment Rates	QC	M	X				
• Further Study Rates	QC	M	X				
Academic Unit (subject to data availability)							
• Completion/Persistence Rates	QI	M	X				
• Employment Rates within Field	QC	M	X			X	X
• Further Study Rates within Field	QC	M	X			X	
• Graduate Rates of Return	CO	M	M			X	
• Faculty-Reported Learning Outcomes	QC	M		X			
Student							
• Self-Reported Learning Outcomes	QI				X	X	X
• Civic Engagement	QC				X	X	
• Satisfaction	QI				X	X	
• Post-Graduate Plans	QC				X		
• Perceived Return on Investment	QC				X	X	

Each topic listed in Table 1 is presented in more detail in Appendix B, together with appropriate citations from the research literature that justify its potential inclusion in the Contextual Strand. Units of analysis in Table 1 refer specifically to the particular entities participating in AHELO. This means that "institutions" and "academic units" refer specifically to those selected to participate in one or more Assessment Strand, and "students" refers specifically to the students enrolled in participating institutions and departments and/or who complete one or more AHELO assessments.

An Approach to Constructing Instruments

The list of topics affecting undergraduate teaching and learning presented in Table 1 is obviously enormous. Not all of these topics can be meaningfully investigated with the time and resources available,

though the expert panel believes that all of them should initially be listed for consideration. In order to reduce the numbers of topics to a practicable level, the panel therefore engaged in a priority-setting exercise. Initially-identified topics were first grouped by potential source of evidence for prioritization within each source. The panel adopted this procedure because some of the sources of evidence considered—for example faculty-staff and student surveys—were expected to be extremely restricted with respect to length and coverage. Others, such as existing documentation and leadership surveys could be longer, but priorities nevertheless had to be set about what and how much to collect in order to avoid information overload.

With appropriate topics assigned to potential sources of evidence, members of the panel then assigned votes to each topic to indicate priority. Votes were arrayed on a three-point scale (3=important priority, 2=somewhat important priority, 1=useful but lesser priority), with a quota established to govern the number of top-ranked votes that could be awarded by any one panel member. Votes were then averaged across the eight-member panel. The result was a rank-ordered list of topics within each potential source of evidence that can be used to inform more detailed discussions of instrument design later on in the project. Subsections below briefly describe these results, and the detailed rank-order lists are provided in tabular form in Appendix C.

Existing Documentation

Evidence drawn from existing documentation can be fairly extensive because no specific data collection instrument or format is required. Instead, much of this evidence will consist of available statistics published by countries, institutions, or academic units (the extent of which will likely vary substantially across settings). Other, similar, sources of evidence will be institutional catalogues and programme descriptions. A third source will be previously conducted research studies on particular institutions or national systems describing teaching and learning practices or assessed learning outcomes. The balance of evidence of this kind will need to be compiled by AHELO staff and their designees. The most effective vehicle for coordinating this process would probably be through a "national project manager" process, with associated data collection protocols, similar to what is currently used in PISA or PIAAC. Priorities for evidence gathering established by the expert panel focused on readily-available descriptive characteristics including:

- Institutional type (highest degree level, research/teaching/vocational orientation, national/regional orientation)

- Characteristics of the national higher education system including numbers and types of HEIs, public/private governance, hierarchical versus horizontal system characteristics, expected research products, teaching versus research orientation, overall volume of tertiary participation, the ability of the system to accommodate massification, and the degree of autonomy with which HEIs can operate.

- Characteristics of the national system that govern the transition from secondary to tertiary study including the percent of secondary graduates continuing their studies, degree of student choice of HEI, and the role of any national examinations. This would include whether there is a systematic "sorting" of students and faculty members across HEIs in a hierarchical fashion.

- Institutional and unit size (enrolment size and number of teaching staff).

- Institutional and unit selectivity with respect to undergraduate programmes.

- Institutional and unit student characteristics including gender, age, international students, SES, disadvantaged groups, international participation, and levels and heterogeneity of student preparation.

- Institutional and unit financial resources including sources, amounts, degree of financial autonomy, budgetary philosophy (*e.g.* "each tub on its own bottom"), use of incentive-funding, research funding, and availability of additional sources of revenues such as special grants or endowments.

- Institutional and unit research emphasis, research activity, and research competitiveness.

- Institutional and unit teaching staff characteristics including qualifications, origins, contracts, experience, percentage of international staff, and relative allocation of time to teaching versus research.

- Institutional degree and disciplinary mix, as well as the existence and size of any cross-disciplinary programmes.

- The existence, role, prominence, and activities of the institution's own internal quality assurance and review processes.

- Institutional and unit drop-out and degree-completion rates.

Leadership Surveys

Evidence drawn from the two leadership surveys—one for institutional leaders and one for the academic unit head—are also less constrained with respect to coverage. Unlike student surveys these questionnaires will not need to be administered under time constraints and, unlike faculty/staff surveys, they are presumably to be completed by individuals who are aware of AHELO and sympathetic to its goals. Accordingly, the voting instructions provided to members of the expert panel to prioritise topics for these surveys gave a good more latitude for inclusion.

Results of this process suggested the following topics for these surveys:

- The prestige, stature, reputation, and traditions associated with the institution.

- Institutional and academic unit research emphasis, ambition, competitiveness, and productivity.

- Top goals and priorities of the institution and unit, as well as leadership's most important identified challenges.

- Institutional and unit selectivity with respect to undergraduate programmes

- Institutional and unit financial resources including sources, amounts, degree of financial autonomy, budgetary philosophy (*e.g.* "each tub on its own bottom"), use of incentive-funding, research funding, and availability of additional sources of revenues such as special grants or endowments.

- Teaching staff characteristics at the institutional and unit levels including qualifications, origins, contracts, experience, percentage of international staff, and relative allocation of time to teaching versus research.

- Institutional and unit teaching cultures including the prominence of teaching and learning in mission statements, pedagogical norms and practices (*e.g.* the balance among lectures seminars, and research projects), reward structures for teaching, the degree to which the institution/programme is seen to bear the primary responsibility for student success versus the student himself, the relative prominence of memorization versus fostering deep learning as the aim of undergraduate pedagogy, and efforts toward developing a common philosophy of undergraduate teaching. This would also include the status of undergraduate teaching within the unit as revealed by such things as whether senior members of staff teach undergraduates (especially in first-year courses) and the degree to which particular teaching practices known to be associated with learning are actively encouraged.

- The role of teacher quality and assessment in institution and unit level staff recruitment, tenure, and promotion.

- Institutional and unit teaching loads, student/staff ratios, and student credit loads.

- Institutional degree and disciplinary mix, as well as the existence and size of any cross-disciplinary programmes.

- Institutional and unit student characteristics including gender, age, international students, SES, disadvantaged groups, international participation, and levels and heterogeneity of student preparation.

- How the institution or unit handles problems of student under-preparation, and whether there are special programmes that address incoming students to ensure their success in the first year of undergraduate study.

- The construction of the undergraduate curriculum at the programme level including such features as the use of short courses, the extent of content hierarchy in the curriculum, parallel versus sequential content coverage, the degree to which content coverage is uniform or consistent across classes and instructors, whether the curriculum has a "general education" requirement (and, if so, its size and structure), and the degree of latitude allowed students in selecting classes.

- The institution or unit's assessment culture including the typical types of assignments used, how student are tested (*e.g.* multiple-choice, constructed problems, degree of reflection/exposition), and the use of assessments to govern student progress through and successful exit from the academic programme (*e.g.* comprehensive examination, thesis, culminating project, or capstone).

- Level of academic challenge at the programme level, and the extent to which there are incentives present to increase student motivation to succeed such as intermediate credentials or curricular requirements, whether grades in earlier classes affect access to later curricular experiences, or whether academic performance is seen to pay off in the labour market.

- The availability of student support services at the institutional or unit level including tutoring, writing centers, academic advising provision, employment or general counseling services, and support for specially-identified student groups (*e.g.* new students/international students, learning disabled or academically challenged students, international or immigrant populations, or members of historically underserved or protected population groups).

- The existence, role, prominence, and activities of the institution's own internal quality assurance and review processes.

- Institutional and unit level dropout and degree completion rates.

- Institutional employment and graduate/professional school placement rates, unit level graduate/professional school placement rates by field, and unit-level employment rates (by field, sector, occupation, and perceived level of preparedness).

Faculty-Staff Surveys

The number of topics addressed by the planned faculty-staff survey will be limited by the general constraints on questionnaire size associated with any such instrument that is returned voluntarily. Longer questionnaires will result in greater topical coverage, but will pay a penalty with respect to diminished response rates. Based on past experience with faculty-staff surveys in the various participating countries, moreover, instruments of varying lengths might be constructed, depending upon the country team's best judgment of what size questionnaire is likely to be completed and what information may be available from other sources.

Expert panel priority ratings in this area suggest that the most prominent topics to address on the faculty-staff survey concentrate on unit-level characteristics and educational good practices, and reported student outcomes:

- Teaching staff characteristics at the institutional and unit levels including qualifications, origins, contracts, experience, percentage of international staff, and relative allocation of time to teaching versus research.

- Unit level teaching culture including the prominence of teaching and learning in department or unit statements of purpose, pedagogical norms and practices (*e.g.* the balance among lectures, seminars, and research projects), reward structures for teaching, the degree to which the programme is seen to bear the primary responsibility for student success versus the student himself, the relative prominence of memorization versus fostering deep learning as the aim of undergraduate pedagogy, and efforts toward developing a common philosophy of undergraduate teaching. This would also include the status of undergraduate teaching within the unit as revealed by such things as whether senior members of staff teach undergraduates (especially in first-year courses) and the degree to which particular teaching practices known to be associated with learning are actively encouraged.

- Unit level research emphasis, ambition, competitiveness, and productivity.

- Unit level assessment culture including the typical types of assignments used, how student are tested (*e.g.* multiple-choice, constructed problems, degree of reflection/exposition), and the use of assessments to govern student progress through and successful exit from the academic programme (*e.g.* comprehensive examination, thesis, culminating project, or capstone). This would also include whether or not and how prominently statements about intended student outcomes are present and known.

- Unit-level teaching loads, student/staff ratios, and student credit loads.

- Specific curricular features in the undergraduate programme such as the relative balance between applied and theoretical content, and whether or not service learning and practicum opportunities are available and used. This would also include the role of early courses in the undergraduate programme (*e.g.* are they intentionally designed to "weed students out?").

- Faculty-reported levels of entering student preparation for undergraduate study, quality of student effort (*e.g.* time on task), levels of faculty-student interaction, and quality of relationships between faculty and students.

- Faculty-reported levels of student achievement of intended learning outcomes (both cognitive and non-cognitive, and aligned with the coverage of AHELO assessments).

Student Survey

As initially specified, the planned student survey is the most constrained of all of the planned instruments in the AHELO Contextual Strand because it is anticipated that it will be administered in conjunction with the assessments themselves. This means at most a twenty-minute administration time. But members of the panel urged the leadership of AHELO to consider some alternatives to collecting all student-level contextual information in this manner. In doing so, members of the panel made the following points. First, as much data as possible about students participating in the assessments should be obtained from student records so that it need not be included on the student survey; alternatively, some of these data might be obtained from a separate "intake" instrument completed well before students sit for the assessments. Second, consideration should be given to administering the survey to samples of enrolled students in similar contexts who are not participating in the assessment to allow a richer and more comprehensive picture to be created of the relevant learning environments and experiences. Third, consideration might be given to creating alternate forms of the student survey, with items spiraled across respondents to address a wider set of topics within a limited set of questions. Finally, some members of the panel believed that participating students might be willing to complete a separate electronic survey addressing some of these topics in greater depth at a later point after completion of the assessment process.

Based on the voting process, panel priorities for topics to address in the student survey include a variety of education-related behaviours and practices, as well as self-reported learning outcomes:

- Individual student demographic and enrolment data to be used for disaggregation purposes including gender, age, international student status, SES, membership in underserved groups, full/part-time study, and academic sub-specialty.

- Perceived preparedness for higher education study in general, and in this undergraduate programme in particular.

- Reported motives for selecting this HEI and field of study—for example, was it the student's first choice?

- A clear sense of "academic destination" that includes knowing the learning outcomes of the programme, what is required to master them, and what kinds of career or post-graduate choices graduation from the programme might yield.

- Reported levels of motivation and particular incentives to do well such as intermediate credentials or curricular requirements, whether grades in earlier classes affect access to later curricular experiences, or whether academic performance is seen to pay off in the labour market.

- Reported level of academic challenge in the programme.

- Reported quality of effort including time on task, class attendance and coming to class unprepared, preparation time, and amount of reading and writing assigned and accomplished.

- Reported levels of participation in active and collaborative learning experiences such as group projects, making presentations, membership in learning communities, participation in research with faculty members, and informal group interactions related to academic work.

- Reported academically-related interactions with faculty and staff outside of class, and quality of relationships with students, faculties, and staff.

- Reported incidence of receiving prompt and meaningful feedback on submitted work.

- Reported levels of participation in specific teaching/learning-enhancing practices (*e.g.* lab work, group and team work, interdisciplinary group-work in engineering). This might also include reported average class sizes in lectures and the availability of smaller group educational experiences.

- Reported engagement in reflective learning (*e.g.* connecting what the student is learning to larger social issues, broader time frames, *etc.*).

- Reported participation in extra-curricular/service activities, student unions, or athletics.

- Student satisfaction with the overall institutional experience and with the particular programme of study. This might include asking students if they would make the same choices again or whether they would recommend the institution/programme to a friend.

- Career expectations and plans beyond graduation (including further education, employment, and voluntary pursuits).

- Self-reported learning outcomes. These should include both cognitive and non-cognitive outcomes, and should address the particular learning outcomes examined by AHELO assessments.

The outlines for coverage presented in this section do not constitute a full template or blueprint for instrument design. But they do provide a clear point of departure for developing the instruments needed to operationalise the AHELO Contextual Strand.

Concluding Thoughts

In conclusion, the expert panel offers the following points regarding further work on the Contextual Strand of the AHELO Feasibility Study.

First, it is important to continually reiterate the importance of the Contextual Strand to both OECD/AHELO leadership and to participating institutions and academic units. As experience with PISA and similar programmes has shown, contextual information is critical for appropriately interpreting the results of direct assessments of learning because of important differences across countries, institutions, and academic units. In the absence of contextual information describing these differences, misinterpretations are likely if assessment results are compared directly. Similarly, without rich contextual data, the potential causal links between environmental factors, teaching and learning practices and behaviours, and learning outcomes cannot be explored. But because contextual information might be seen as "merely background" by participating institutions and units, they may not understand how important this information is. Project leadership should make every effort to ensure that this does not happen.

Second, the development of the Contextual Strand can usefully proceed in phases. This report recommends the immediate development of four sources of evidence—existing documentation, leadership surveys (institutional and academic unit), faculty-staff surveys, and student surveys. Two additional sources of evidence—alumni surveys and collecting data from employers—were deemed important but with less priority for immediate development. In addition, many topics were identified by the panel as potentially useful ingredients of the Contextual Strand, but were not listed as priorities for inclusion in instruments constrained by size and response time. Both the additional instruments and exploration of additional lower-priority topics should be considered in later phases of the project.

Third, the panel believes that investment in collecting a wide range of data in the Feasibility Study may lead to refinements and reductions in the amount of contextual data that needs to be collected in the operational stages of AHELO. More specifically, administering both generic and discipline-level assessments to the same student populations will allow the relationships among the two levels to be more fully understood. This may result in reduced redundancy among the various assessments in later administrations. Similarly, the scope of data collection about contextual topics themselves should be set broadly for the Feasibility Study with the expectation that subsequent analyses of this broad range of data can significantly reduce what needs to be collected at later stages because the relationships among potential contextual elements will be better understood. It is better to cast a wide net at the beginning, then refine both topics and instruments based on what is learned.

Fourth, the panel expects that there will be considerable variation in how much existing documentation on contextual topics exists across country contexts—and to some extent across institutional contexts as well. This means that the balance between relying on existing documentation and direct data gathering should appropriately vary across contexts. Wherever possible, reliance should be placed upon existing documentation such as previously-collected statistics and research studies, so that the number of additional topics that can only be explored by surveys can be maximised. Mapping what kinds of evidence will be collected or assembled by what means should be among the first tasks addressed by national project managers and country implementation teams.

Finally, concrete plans should be made for further developing the Contextual Strand over the next three to six months. Priorities here should include more detailed design specification of the three survey instruments, further exploration of the extent to which contextual evidence can be assembled from existing documentation in specific country contexts, and further development of the analytical questions.

APPENDIX A: MEMBERS OF THE EXPERT PANEL

- Per Olaf Aamodt, NIFU STEP, Norway

  Per Olaf Aamodt holds a masters degree in sociology from the University of Oslo (1972). He is currently senior researcher at NIFU STEP. His professional interests include recruitment to higher education, non-completion and study progress as well as international studies of higher education. Recent publications include (2005): Access to Higher Education within a Welfare State System. Developments and Dilemmas in Texeira, Johnstone, Rosa & Vossensteyn (eds.): A fairer deal? Cost-sharing and Accessability in Western Higher Education, Dordrecht, Kluwer Academic Publishers; (2005) with Anton Havnes: Student Involvement and Learning Outcome in Professional Education in Norway in Rust, Chris (ed.): Improving Student Learning. Diversity and Inclusivity. Oxford, The Oxford Center for Staff & Learning Development; (2005) with Svein Kyvik: Access to higher education in the Nordic countries in T. Tapper & D. Palfreyman (red.): Understanding mass higher education: comparative perspectives on access. London, Routledge Falmer; (2008) with Agnete Vabø: Nordic Higher Education in Transition. In: D. Palfreyman & T. Tapper (eds.): Structuring Mass Higher Education, New York, Routledge; (2008) with Anton Havnes: Aamodt, Per Olaf & Anton Havnes (2008): Factors Affecting Professional Job Mastery: Quality of Study or Work Experience? Quality in Higher Education, Vol. 14, No. 3 pp 233 – 24. Of particular relevance to the panel are two specific areas of interest: study conditions, student retention and drop-out and Learning outcomes, especially with an empirical approach – which is the topic of the paper Mr. Aamodt at the IMHE General Conference in September this year.

- Jim Allen, Maastricht University/ROA, the Netherlands

  Jim Allen is a senior researcher at the Research Centre for Education and the Labour Market (ROA), Maastricht University, The Netherlands (since 1997). From 1998 to 2008 he was responsible for coordinating the annual national university graduate survey in the Netherlands (WO-Monitor). From 1998 to 2001 he was a team member in the project *Careers after Higher Education: a European Research Study (CHEERS)*, an international comparative study among higher graduates in 11 European countries and Japan. Starting in spring of 2004 he assist division head Rolf van der Velden in coordinating the project The Flexible Professional in the Knowledge Society: New Demands on Higher Education in Europe (REFLEX), a similar international comparative graduate survey that built on and expanded the insights of the CHEERS study. His research interests are primarily focused on the relation between education and the labour market, which has resulted in publications on among other topics differential returns to education, career development, overeducation, skill utilization, skills obsolescence, and the methodology of measuring competencies in survey research. He has worked together Rolf van der Velden and their colleague Ger Ramaekers on developing an internationally comparable instrument for measuring competencies of higher education graduates through graduate surveys. In addition, he and Professor van der Velden have written an overview article reviewing the methodological advantages and pitfalls of using self-assessments as a way of measuring competences.

- Eric Bettinger, Stanford University, United States

  Professor Eric Bettinger (Stanford University) is an active researcher in the economics of higher education. His research is very quantitative in nature and utilises statistical techniques that allow him to identify causal relationships between components in higher education and student outcomes. In recent years, he has published several articles focusing on the role of remediation in higher education. Bettinger has also published articles about the effects of need-based financial aid on student retention. Using statistical tools and exploiting "natural experiments," Bettinger's research suggests that need-based awards significantly improve students' likelihoods of persisting in higher education after the first year. In other work, Bettinger has studied the role of adjunct faculty and other faculty characteristics on student outcomes. Bettinger has experience conducting randomised interventions to examine the factors that impact student success in primary and secondary school. He helped to administer and conduct research on educational voucher programmes in Colombia and the United States. Currently, he is involved in the evaluation of a randomised experiment which streamlines the financial aid application process for low-income families in the United States.

- Peter T. Ewell, National Center for Higher Education Management Systems (NCHEMS), United States

  Peter T. Ewell is Vice President of the National Center for Higher Education Management Systems (NCHEMS). A member of the staff since 1981, Dr. Ewell's work focuses on assessing institutional and higher education system effectiveness and the outcomes of college, and involves both research and direct consulting with institutions and state systems on collecting and using assessment information in planning, evaluation, and budgeting. He has directed many projects on this topic, including initiatives funded by the W. K. Kellogg Foundation, the National Institute for Education, the Consortium for the Advancement of Private Higher Education, the Lumina Foundation, and the Pew Charitable Trusts. In addition, he has consulted with over 375 colleges and universities and twenty four state systems of higher education on topics related to performance indicators and the assessment of student learning. He has also worked internationally in these fields, most recently in Hong Kong. Dr. Ewell has authored seven books and numerous articles on the topic of improving undergraduate instruction through the assessment of student outcomes. In addition, he has prepared commissioned papers for many agencies in the U.S., including the Education Commission of the States, the National Governors' Association, the National Conference of State Legislators, and the National Center for Public Policy in Higher Education. A graduate of Haverford College, he received his Ph.D. in Political Science from Yale University in 1976 and was on the faculty of the University of Chicago.

- Gero Federkeil, Centre for Higher Education Development (CHE), Germany

  Gero Federkeil is a trained sociologist and graduated at Bielefeld University in 1989. After a period of working in empirical social research at the university, he has been working in the field of higher education since 1993. He started to work for the German Science Council in 1993 where he focused on higher education, evaluation and indicators, higher education and employment and on university medicine. He conducted many evaluations of German higher education institutions. Since 2000 he is working at the CHE Centre for Higher Education Development as a project manager. His main fields of work are ranking, evaluation, quality management and performance indicators. He is co-ordinating the international ranking activities at CHE. and has published on quality assessment and rankings. He is member of the German Association of Higher Education Research and the German Association of Evaluation. Gero Federkeil is Vice-chair of the International Rankings Expert Group (IREG).

- Alexander C. McCormick, National Survey of Student Engagement (NSSE), Indiana University's Center for Postsecondary Research, United States

  Alexander C. McCormick directs the National Survey of Student Engagement (NSSE), housed at Indiana University's Center for Postsecondary Research. More than 1,300 colleges and universities in the U.S. and Canada have used NSSE to assess the extent to which undergraduates engage in and are exposed to effective educational practices. Through his work with NSSE, McCormick aims to enrich the national discourse about quality and accountability in higher education, while also providing institutions with tools they can use to diagnose and improve teaching and learning. His research interests center around assessment, accountability, and organisational change and improvement in higher education. McCormick also holds a faculty appointment at the Indiana University School of Education's Educational Leadership and Policy Studies department, where he teaches in the Higher Education and Student Affairs programme. Before coming to Indiana, he spent nine years as Senior Scholar at The Carnegie Foundation for the Advancement of Teaching, an educational research and policy center. In that role, he led a major overhaul of the Foundation's widely-used Classification of Institutions of Higher Education. He holds graduate degrees from Stanford University (Ph.D. in education and sociology, master's degree in educational administration and policy analysis), and a bachelor's degree in French from Dartmouth College.

- Naoyuki Ogata, Research Institute for Higher Education, Hiroshima University, Japan

  Mr Ogata is an associate professor of Research Institute for Higher Education at the Hiroshima University. His main study areas are college-to-work transition and relevance of higher education to work. He has participated in the international comparative college graduate survey such as CHERS and Reflex conduced in European countries and Japan. He is also a member of large-scale student survey (like NSSE in US) project in Japan and studying college impact on developing competences such as field specific knowledge and generic skills with reference to the model quoted in "How College Affects Students" written by Pascarella and Terenzini. His research interests focus on outcomes and on the impacts of process.

- Anna Prades, Catalan University Quality Assurance Agency, Spain

  Anna Prades has a degree in Psychology and a Phd in Pedagogy by the Universitat de Barcelona. She is project manager in the Catalan University Quality Assurance Agency. Previously she worked in the Quality Assurance Unit of the Universitat de Barcelona. She has been active in designing quality assessment methodology, coordinating work-groups designing good-practices guidelines. She has been methodologist in several external assessments. She has coordinated the graduate and Phd placement surveys that the seven Catalan universities carry out periodically since 2001. In 2007 she was involved in a research project, which was funded by the Spanish Ministry of Education and Science, for developing a Performance Indicator Model for the Spanish Higher Education System.

APPENDIX B: DETAILED DESCRIPTIONS OF THE CONTEXTUAL TOPICS IDENTIFIED

This Appendix provides a fuller description of each of the contextual topics identified as potentially important by the expert panel, together with appropriate citations from the research literature that justify its potential inclusion in the Contextual Strand.[3] Topics are presented in the order contained in Table 1, organised around the conceptual scheme.

Physical and Organisational Characteristics

National System of Higher Education

- Numbers and Types of HEIs. This topic embraces the shape of the tertiary education landscape in the country including such factors as numbers of HEIs of different types, public/private mix, general orientation toward the balance between teaching and research as well as the types of research projects produced, and whether the system is hierarchical or flat with respect to missions and prestige. These factors will generally condition the kinds of outcomes that might be expected (Clark 1987).

- Volume of Tertiary Study. This topic addresses the overall participation of citizens and secondary completers in postsecondary study. High proportions of citizen participation mean that the talent pools of students available for assessment though AHELO may differ markedly across countries. This is important contextual information because incoming student ability is a consistently strong predictor of both assessed student performance and learning gain (Pascarella and Terenzini 1991, 2005).

- Capacity of Tertiary Study. This topic is similar to the above but focuses on the structural limits on enrolment determined by overall capacity. Another way of putting this is the extent to which a national system is designed especially to accommodate massification through of the types of institutions that comprise it and/or their ability to grow rapidly. If a national system cannot accommodate all who seek or are qualified to enroll, the result will necessarily impact the overall ability levels of those attending (Clark 1987).

- Transition to Tertiary Study. This topic addresses the way students move into the nation's tertiary education system including such variables as proportions of secondary graduates moving directly into tertiary study, as well as how students end up in particular types of HEIs through selection or choice (including the role of national examinations). It also addresses the important topic of student talent distribution across institutions (*i.e.* whether the most able students enroll at a few similar institutions). Factors like these will help to determine the relative distribution of high-ability students across the tertiary sector and will directly determine the overall average ability

[3] Note: To minimise redundancy, these citations are provided only the first time a given factor or relationship is discussed and not repeated for the same topic at a different unit of analysis.

levels of each country's entering tertiary population. As noted above, this may affect assessment results through selection bias.

- Transitions within Tertiary Sector. This topic addresses the way students move across institutions within tertiary education and includes the overall volume of such movement, as well as the ease and flexibility of credit transfer arrangements. High volume and flexibility may ease student progress toward a degree but may have a negative impact on curricular coherence. This topic may also embrace the flow of teaching staff across country lines. Many institutions rely heavily on foreign-trained instructors and this may affect undergraduate instructional conditions.

- Tertiary Import/Export. This topic centers on student flows into and out of the country's tertiary education sector. As in the case of internal transition, high volumes and flexible transfer may ease student progress but negatively impact the coherence of learning experiences with consequent potential impacts on assessed learning outcomes, as well as the ability to attribute outcomes to a given institution. (Goedegebuure and Van Vught 2004).

- Student Characteristics. This topic addresses the overall demographics of student participation in tertiary study including gender balance, age, socio-economic status, and the presence of identified or protected classes (*e.g.* underserved populations, aboriginals, *etc.*). Research has shown substantial gaps in assessment results on such factors in some national settings (Pascarella and Terenzini 1991, 2005).

- Funding Patterns. This topic address the shape of the resource allocation distribution across institutions including such topics as the relative proportion of resources devoted to research versus teaching (and whether or not research is separately funded) and proportions of national resources devoted to student support services. How funding is allocated by function can have a significant impact on both attainment and student learning outcomes. (Gansemer-Topf, Saunders, Schuh, and Shelley 2004).

- Governance. This topic addresses the organisation and autonomy arrangements for institutions within the national system. Institutional autonomy may have a significant connection with the ability of an institution to innovate within its undergraduate programmes of study, and may consequently affect the learning outcomes achieved (Goedegebuure and Van Vught 2004, Clark 1987).

- Quality Assurance System. This topic addresses the existence, centrality, and general orientation of the country's Quality Assurance System for tertiary education. Active and extensive Quality Assurance may help focus institutional attention on undergraduate study, especially if the system looks at defined student learning outcomes (Westerheijden 2001).

- Teaching Qualifications. This topic examines whether and the extent to which specific teaching qualifications govern entry into the undergraduate teaching force. The presence of specific qualifications governing entry may directly affect the quality of the undergraduate student learning experience (Coates 2007, Clark 1987).

- Generic/Discipline Skills Balance. This topic focuses on the extent to which the national tertiary education system privileges one form of outcome over another through its predominant curricular structure, as well as the levels of education at which learning generic skills is emphasised.

Institution

- Type. This topic addresses principal characteristics of the institution that are relevant to teaching and learning including highest degree level offered, basic orientation toward research and teaching, occupational or professional instructional focus, national or regional orientation, and public/private control. While not directly related to the quality of undergraduate education, these factors very likely condition the settings in which it occurs.

- Size. Size refers primarily to enrolment and faculty numbers. Unless deliberate attempts are made to create small settings in large institutions, smaller institutions tend to be associated with the presence of more identifiable instructional good practices at the undergraduate level (Kuh *et.al.* 2005).

- Selectivity. This refers to the general entering ability levels of undergraduates. As above, selectivity is directly related to assessed learning outcomes and must therefore be taken into account or controlled for if such outcomes are to be benchmarked. Most past research shows a direct correlation between entering student abilities and assessed learning outcomes no matter at what point in the student's career these are assessed (Pascarella, et. al. 2006).

- Degree/Discipline Mix. This topic addresses the relative disciplinary emphasis or specialization of the institution's undergraduate curriculum as reflected in the ratio of credentials granted in a particular discipline or academic area to the total number of awards (including the proportion of interdisciplinary programmes). This mix can have a notable impact on the relative instance of particular educational practices and, therefore, educational outcomes. For example, business programmes may involve more group-work and science-based programmes more problem-solving experiences (McCormick et. al. forthcoming).

- Research Emphasis. This topic refers to the extent to which research is seen as the dominant ethos of the institution in terms of what it values, how it rewards its members, and how it characterises itself to the external world. This may have a substantial bearing on how it approaches the task of undergraduate education (Fairweather 1996).

- Environment. This topic addresses the physical setting of the institution as it relates to undergraduate education including metropolitan/rural setting, and the extent to which its undergraduate student population is residential or commuter. The former may provide distinctive instructional opportunities for undergraduates (for instance, service learning), while the latter may provide particularly effective instructional settings (for instance, residential college programmes).

- Infrastructure. This topic examines relevant aspects of the physical environment that conditions undergraduate instruction including buildings, laboratory facilities, instructional equipment, and technology infrastructure. These provide the necessary conditions for particular high-value practices to be deployed for undergraduates.

- Financial Resources. This topic addresses both the amount and the character of the institution's resource base. Subtopics may include amounts of resources, their sources (*e.g.* government, student fees, research and external support), the degree of financial autonomy that the institution enjoys from government, endowments and additional sources of revenue, relative competitiveness with respect to research support, and the internal philosophy according to which funds are allocated to academic units (for example, the use of incentive funds or requirements that academic units act as entrepreneurs to generate their own resources). These are all indirect

contextual factors, as few empirical studies have yielded meaningful direct relationships between overall spending and learning outcomes (Pike *et.al.* 2007).

- Student Characteristics. These are overall descriptors of the undergraduate student population including demographics like gender, age, SES, international students and membership in underserved or protected populations, as well as enrolment descriptors such as full or part-time status, commuter *vs.* residential status, and levels of incoming academic preparation. The particular mix of these student population characteristics may affect aggregate performance on AHELO assessments just as they affect the outcomes of any other tests.

- Drop-Out/Completion Rates. Drop-out essentially acts as an internal merit-based selection mechanism that can result in a fairly high level of general student academic ability by the time students approach the end of their programmes. Because this is the point at which AHELO assessments are administered, low completion rates may exert the same kinds of influences on student performance as high institutional selectivity.

- Teaching Staff. This includes characteristics of teaching staff that may be relevant to undergraduate teaching and learning such as qualifications (degree-level, institutional training, international origin, years of teaching experience, *etc.*), appointment (for example regular or contingent, full-time or part-time), and proportion of time devoted to undergraduate teaching versus graduate instruction or research. All of these have a bearing on the quality of effort faculty devote to teaching and the use of instructional good practices (Fairweather 1996, Fink 2003).

- Teaching Loads and Student/Staff Ratios. Regardless of type of appointment, teaching staff may have very different teaching loads with respect to the number of different teaching preparations for which they are responsible in a given academic term and the number of students enrolled in these classes. This will necessarily have a bearing on how much time they can devote to each class preparation and student.

- Autonomy. This refers to the relative degree of decision latitude that the institution enjoys with respect to its governing authorities. High autonomy may allow the institution to develop or deploy distinctive instructional practices in undergraduate study that it would otherwise have been able to do.

- Teaching Support. This topic addresses the extent to which the institution has developed specific and identifiable staff development resources and support directed at those who teach undergraduates. Examples include teaching development centers and their associated staffing, size, and financial support (Fink 2003).

- Quality Assurance System. This topic is focused on the overall size and scope of the institution's internal academic quality assurance system including the extent to which it is focused on examining the quality of undergraduate study and, more particularly, the degree to which it explicitly specifies and examines undergraduate student learning outcomes.

- Industry/Professional Link. This topic examines the overall relationship between the institution and the employment and professional community. Strong relationships may provide additional resources and learning opportunities for undergraduates (for example, meaningful internships and hands-on training opportunities).

Academic Unit

- Size. Size refers primarily to enrolment and faculty numbers. Smaller units tend to be associated with the presence of more identifiable instructional good practices at the undergraduate level.

- Selectivity. This refers to the general entering ability levels of undergraduates and the demand for places that the unit and its programmes enjoy. As above, selectivity is directly related to assessed learning outcomes and must therefore be taken into account or controlled for if such outcomes are to be legitimately benchmarked.

- Research Emphasis/Competiveness. This topic refers to the extent to which research is seen as the dominant ethos of the academic unit in terms of what it values, how it rewards its members, and how it characterises itself to the external world. The topic also addresses the outcomes of this orientation in terms of actual research competitiveness within the discipline as revealed by external funding, rankings, and reputation within the field. These factors may have a substantial bearing on how the unit approaches the task of undergraduate education.

- Advanced Study. This refers to whether the academic unit only offers an undergraduate programme or has opportunities for advanced study in the discipline at the Master's level and beyond. The presence of graduate training opportunities may have a substantial effect on the ethos of the unit (*e.g.* student experience with role models in the discipline, *etc.*) as well as making the unit attractive in terms of staff recruitment (McCormick *et.al.* forthcoming).

- Curriculum Orientation. This topic addresses the extent to which the unit's programmes are primarily oriented toward employment or toward furthering theory and research in the discipline. It also embraces the employability of programme graduates in the professional labour market. This orientation will strongly affect both disciplinary content at the undergraduate level and key elements of teaching provision such as the use of practica, internships, and workshops.

- Sub-Specialization. This refers to the number of sub-fields within the discipline that are offered as distinct degree offerings or tracks—for example electrical engineering or international economics. Specialization will affect student opportunities to master different areas of knowledge within the discipline that will be tested in the AHELO Discipline Strand and may affect the kinds of learning experiences that students participate in related to developing generic skills. It may also affect the alignment between the content of the curriculum and the AHELO Discipline Strand assessments.

- Infrastructure. This topic examines relevant aspects of the physical environment that conditions undergraduate instruction including buildings, laboratory facilities, instructional equipment, and technology infrastructure. These provide the necessary conditions for particular high-value practices to be deployed for undergraduates.

- Financial Resources. This topic addresses both the amount and the character of the academic unit's resource base. Subtopics may include amounts of resources, their sources (*e.g.* government, student fees, research and external support), the degree of financial autonomy that the unit enjoys within the institution, special endowments and additional sources of revenue, relative competitiveness with respect to research support, and the internal philosophy according to which funds are allocated to academic unit priorities. These are all indirect contextual factors, as few empirical studies have yielded meaningful direct relationships between overall spending and learning outcomes.

- Student Characteristics. These are overall descriptors of the undergraduate student population enrolled in the unit including demographics like gender, age, SES, international students and membership in underserved or protected populations, as well as enrolment descriptors such as full or part-time status, commuter *vs.* residential status, and levels of incoming academic preparation. The particular mix of these student population characteristics may affect aggregate performance on AHELO assessments just as they affect the outcomes of any other tests.

- Drop-Out/Completion Rates. Drop-out essentially acts as an internal merit-based selection mechanism that can result in a fairly high level of general student academic ability by the time students approach the end of their programmes. Because this is the point at which AHELO assessments are administered, low completion rates may exert the same kinds of influences on student performance as high selectivity.

- Teaching Staff. This includes characteristics of teaching staff that may be relevant to undergraduate teaching and learning such as qualifications (degree-level, institutional training, international origin, years of teaching experience, *etc.*), appointment (for example regular or contingent, full-time or part-time), and proportion of time devoted to undergraduate teaching versus graduate instruction or research. All of these have a bearing on the quality of effort devoted to teaching and the use of instructional good practices.

- Teaching Loads and Student/Staff Ratios. Regardless of type of appointment, teaching staff may have very different teaching loads with respect to the number of different teaching preparations they are responsible for in a given academic term and the number of students enrolled in these classes. This will necessarily have a bearing on how much time they can devote to each class preparation and student.

- Autonomy. This refers to the relative degree of decision latitude that the academic unit enjoys within the institution. High autonomy may allow the unit to develop or deploy distinctive instructional practices in undergraduate study that it would otherwise have been able to do. High autonomy may also allow the unit to recruit its own students independent of institutional admissions procedures and to establish more selective admissions standards.

- Teaching Support. This topic addresses the extent to which the academic unit has developed specific and identifiable staff development resources and support directed at those who teach undergraduates. Examples include teaching development centers and their associated staffing, size, and financial support.

- Quality Assurance System. This topic is focused on the presence, size, and scope of the academic unit's own academic quality assurance system including the extent to which it is focused on examining the quality of undergraduate study and, more particularly, the degree to which it explicitly specifies and examines undergraduate student learning outcomes.

- Industry/Professional Link. This topic examines the specific relationships between the academic unit and the relevant employment and professional communities. Strong relationships may provide additional resources and learning opportunities for undergraduates (for example, meaningful internships and hands-on training opportunities). The topic also includes the participation of professionals in teaching and the extent to which they are considered full faculty colleagues, as well as opportunities for in-service training provided to regular members of the faculty.

- Governance. This topic addresses how the curriculum and academic policies within the academic unit are established and maintained, and its governance relationship with the professional community with which it is associated. Such arrangements may include the presence of independent advisory or policy boards drawn from the professional community, and relationships with accrediting organisations.

Individual Student

- Student Demographics. These factors include gender, age, SES, and membership in underserved and protected populations. They are primarily intended as disaggregation variables.

- Enrolment Characteristics. These include variables describing how the student is participating in the programme such as full- or part-time attendance, resident or commuter status, and subspecialty (if any) within the discipline.

- Preparedness. This topic addresses individual student background characteristics that may affect performance in the discipline like general academic preparedness for disciplinary study (for example general and specialised admissions test scores or secondary preparation), relevant prior work or military experience, and general motivational factors such as maturity or self-confidence.

- Knowledge About and Access to Support. This refers to the student's awareness of and access to important sources of available support for study available at the institutional or academic unit level including financial support, tutorial services, and counseling (general or employment-related) (Kuh 2008, Kuh *et.al.* 2005).

Education Related Behaviours and Practices

National System of Higher Education

- National Curriculum. This factor addresses whether or not the country's system of higher education has a national curricular structure or mandated content coverage either in general or in one or both of the two disciplines of interest, engineering and economics. Several levels of implementation of "national curriculum" might be considered ranging from full prescription of all content and delivery sequence to more flexible structures that prescribe content but not necessarily the order and pace of delivery.

- Qualifications Framework. This addresses the presence and degree of elaboration of the country's Qualifications Framework (if present). Qualifications Frameworks may be important in defining contexts for assessment because they specify, and therefore draw attention to, specific learning outcomes that should be taught toward and tested. Qualifications Frameworks might frame general abilities applicable to all fields, and/or in specific disciplines such as engineering or economics (Westerheijden 2001).

- Curriculum Emphasis Toward Generic Skills. This topic examines the degree to which fostering generic academic skills is deemed to be a primary responsibility of the tertiary sector or is expected to be accomplished by secondary study. It also reflects whether specific learning outcomes are specified in either domain.

- Teaching Force. This topic centers on national factors that may affect the quality of the teaching force as a whole. These may include direct indicators of quality such as national requirements for the preparation of tertiary instructors, the size and structure of the "pipeline" for generating new

teaching staff, the status of teaching and role of tenure on a national basis (if any), and the resulting allocation of teachers of varying quality/preparation across HEIs (Coates 2007).

Institution

- Teaching Culture. This topic addresses the general orientation of the institution toward emphasizing learner-centered behaviours and practices as indicated by its mission and values statements; statements reflecting common philosophies or approaches to teaching; policies encouraging the development and use of learner-centered experiences such as the balance between lectures, seminars, and projects; the extent to which the institution takes responsibility for student learning or this is considered a matter of individual student choice and effort; and emphasis on deep versus surface learning (Harvey and Knight 1996, Tagg 2003, Fink 2003).

- Assessment Culture. This topic address the general manner in which students are assessed throughout the undergraduate curriculum including how students are tested (*e.g.* multiple-choice, essays, problems), how written assignments are constructed (*e.g.* recall-based versus mastery-based), the extent to which explicit intermediate assessments or tasks govern advancement across various levels in the curriculum, and whether or not culminating or capstone performances (*e.g.* comprehensive examinations, projects, theses) are present as a condition for graduation (Tagg 2003).

- Curriculum Structure. This topic examines particular structural features of the undergraduate curriculum such as the use of long or short courses, cohort or mastery-based approaches, hierarchical/sequential versus parallel structures of topical coverage, uniformity of content/requirements across programmes, the existence of common (*e.g.* general education) requirements across all programmes, and the extent of student choice (Ewell 1996, Ewell and Jones 1996).

- Teaching Modes. This topic examines the range and types of teaching approaches employed including traditional face-to-face pedagogies, technology enhancements within the classroom, distance or e-learning, small-group or peer learning, service learning, or self-paced learning (Pascarella and Terenzini 2005, 1991, Harvey and Knight 1996, Kuh 2008, Kuh *et.al.* 2005).

- External Learning Experiences. This topic centers on the extent to which the institution employs learning experiences outside of formal training such as internships, clinical placements, apprenticeships, and guided independent study in workplaces.

- Academic Challenge. This topic addresses the level of challenge or difficulty of the undergraduate curriculum as revealed in such factors as how much time students are expected to devote to academic work, amounts of expected reading and writing, level of cognitive complexity characteristic of assignments and problem sets, and numbers of times students are explicitly assessed (Chickering and Gamson 1987, Pascarella and Terenzini 2005, 1991, Kuh *et.al.* 2005).

- Role of Generic Outcomes. This topic considers the role of generic learning outcomes in the undergraduate curriculum including such matters as whether generic learning outcomes are explicitly stated and assessed, whether they are explicitly mapped to particular classes or stages in undergraduate student progress, and whether they are explicitly required to be stated in class syllabi and assessed. All of these will affect students' direct exposure to generic outcomes, so may be related to performance on related assessments.

- Role of Teacher Quality. This topic examines the degree to which quality of teaching is considered explicitly considered as a criterion in recruiting new staff (for example inclusion in job descriptions or whether a teaching portfolio or class preparation is required in the hiring process), and its role in the faculty incentive structure (for example in decisions about promotion, tenure, merit awards, *etc.*) (Kuh *et.al.* 2005).

- Adjunct Faculty. This topic addresses the extent to which non-regular teaching staff are used in undergraduate instruction including non-tenured or part-time staff, or graduate teaching assistance. This includes numbers and preparation, as well as their manner of employment—for example, what kinds of classes they teach, the independence they exercise in choosing what and how to teach, and how their performance is assessed.

- Specific Expectations for Teaching Practices. This topic examines the institution's expectations for the use of particular learner-centered practices as revealed in their mandatory or suggested inclusion as part of course syllabi, the contents of syllabi, support for the development of such practices in centers for teaching and learning, and consideration of the use of such practices in the reward structure for teaching staff (Kuh *et.al.* 2005, Fink 2003).

- Integration of New Students. This topic concerns how new undergraduates are integrated into academic study and the physical/organisational/cultural setting of the institution. Sub-dimensions include the extent to which a formal student intake programme is present, its staffing and resources, specific practices included in participation and their consistency with learner-centered pedagogies, and whether or not student participation is required. It also examines how deficiencies in student preparation are detected and addressed—for example, through a process that is separate from regular academic provision in the form of tutoring or add-on modules, or integrated into regular academic work (Kuh *et.al.* 2005).

- Student Support Services. This addresses the general academic support provided to undergraduate students including academic advising, tutoring, the use of writing centers or similar organisational cells devoted to developing particular academic skills, and career or professional counseling. Rather than simply noting the extent to which these features are present in or absent from the institution, the topic embraces how they are delivered with respect to practice, with a particular focus on ease of student access and whether they are operated proactively in an outreach mode to identify students in potential difficulty (Tinto 1993, Kuh *et.al.* 2005).

Academic Unit

- Teaching Culture. This topic addresses the general orientation of the academic unit or programme toward emphasizing learner-centered behaviours and practices as indicated by any mission and values statements; statements reflecting common philosophies or approaches to teaching; policies encouraging the development and use of learner-centered experiences such as the balance between lectures, seminars, and projects; the extent to which the programme takes responsibility for student learning or this is considered a matter of individual student choice and effort; and emphasis on deep versus surface learning.

- Assessment Culture. This topic address the general manner in which students are assessed throughout the undergraduate curriculum including how students are tested (*e.g.* multiple-choice, essays, problems), how written assignments are constructed (*e.g.* recall-based versus mastery-based), and the extent to which explicit intermediate assessments or tasks govern advancement across various levels in the curriculum.

- Curriculum Structure. This topic examines particular structural features of the undergraduate curriculum such as the use of long or short courses, cohort or mastery-based approaches, hierarchical/sequential versus parallel structures of topical coverage, uniformity of content/requirements across programmes, the existence of common (*e.g.* general education) requirements across all programmes, and the extent of student choice. At the programme level, it is particularly concerned with the presence and extent of addition-to-classroom exit requirements such as whether or not culminating or capstone performances (*e.g.* comprehensive examinations, projects, theses) are present as a condition for graduation.

- Teaching Modes. This topic examines the range and types of teaching approaches employed including traditional face-to-face pedagogies, technology enhancements within the classroom, distance or e-learning, small-group or peer learning, service learning, or self-paced learning.

- External Learning Experiences. This topic centers on the extent to which the academic programme employs learning experiences outside of formal training such as internships, clinical placements, apprenticeships, and guided independent study in workplaces.

- Academic Challenge. This topic addresses the level of challenge or difficulty of the undergraduate curriculum as revealed in such factors as how much time students are expected to devote to academic work, amounts of expected reading and writing, level of cognitive complexity characteristic of assignments and problem sets, and numbers of times students are explicitly assessed.

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- Adjunct Faculty. This topic addresses the extent to which non-regular teaching staff are used in undergraduate instruction including non-tenured or part-time staff, or graduate teaching assistance. This includes numbers and preparation, as well as their manner of employment—for example, what kinds of classes they teach, the independence they exercise in choosing what and how to teach, and how their performance is assessed.

- Specific Expectations for Teaching Practices. This topic examines the academic unit's expectations for the use of particular learner-centered practices as revealed in their mandatory or suggested inclusion as part of course syllabi, the contents of syllabi, support for the development of such practices in centers for teaching and learning, and consideration of the use of such practices in the reward structure for teaching staff.

- Integration of New Students. This topic concerns how new undergraduates are integrated into academic study and the physical/organisational/cultural setting of the unit. Sub-dimensions include the extent to which a formal student intake programme is present distinct from that of the

institution, its staffing and resources, specific practices included in participation and their consistency with learner-centered pedagogies, and whether or not student participation is required. It also examines how deficiencies in student preparation are detected and addressed—for example, through a process that is separate from regular academic provision in the form of tutoring or add-on modules, or integrated into regular academic work.

- Student Support Services. This addresses the general academic support provided to undergraduate students including academic advising, tutoring, use of writing centers or similar organisational cells devoted to developing particular academic skills, and career or professional counseling. Rather than simply noting the extent to which these features are present in or absent, the topic embraces how they are delivered with respect to practice, with a particular focus on ease of student access and whether they are operated proactively in an outreach mode to identify students in potential difficulty.

- Orientation within the Discipline. This topic examines the position the academic unit or programme believes it holds within the national/international disciplinary community—for example, whether it is a leading member of the disciplinary community, is known for particular strengths or features, or whether it is known for its faculty's identification with a particular approach or school of thought.

- Emphasis on Applied Work. This addresses the extent to which the academic unit's undergraduate programme is intended primarily to develop student mastery of the theoretical foundations of the disciplines and its scholarly practices (with an implied destination of graduate study) or to develop applied professional skills in preparation for the workplace.

- Class Sizes. This topic focuses on the number of students accommodated by the various learning environments that comprise the unit's academic programmes. These will chiefly be individual classes but may include other kinds of learning settings such as tutorials, internships and service placements, and peer-oriented learning communities.

- Student-Faculty Interaction. This topic examines the extent to which undergraduates have meaningful interactions involving discussions of academic content and skills outside regular classroom interaction (Kuh *et.al.* 2005, Kuh 2004).

Individual Student

- Quality of Effort. This topic addresses the extent to which the individual student invests in trying to succeed in her or his academic career including time on task devoted to academic preparation and completing assignments, self-reported investment and motivation, class attendance, self-assessment of class preparation, proportion of assigned reading completed, and voluntary engagement with additional work or reading on assigned topics (Kuh *et.al.* 2005, Pace 1979).

- Active/Collaborative Learning. This topic addresses the extent to which the individual student participates in a range of learning experiences that emphasise active learning strategies or collaboration with others such as hands-on practice-oriented activities, making presentations in and outside of classes, working with academic staff on research projects, participation in study groups, team problem-solving projects, and informal group interactions related to academic study (Kuh et. al. 2005, Karukstis and Elgren 2007).

- Integrative/Reflective Learning. This topic addresses the extent to which the individual student participates in learning experiences that require knowledge and skills learned in one part of the

programme to be applied effectively in a new setting in another part of the curriculum or in a practice setting. It also examines the extent to which time or opportunities for student reflection are available on such occasions and whether students take advantage of these opportunities for reflection to deepen their mastery in the discipline and to connect what they have learned to their application larger social or practice contexts outside the academy (Harvey and Knight 1996).

- Perceived Academic Challenge. This topic examines the extent to which academic work in the programme is seen by students to be challenging or difficult including perceived difficulty of understanding faculty lectures and presentations, challenge of readings or out-of-class assignments, and difficulty of assessments and meeting graduation requirements. It may also include student reports about their perceptions of how difficult academic work is for other students in the programme (Kuh 2008).

- Prompt and Meaningful Feedback. This topic examines how frequently students report receiving feedback on their academic performance (both overall and for specific types of assignments), how helpful and relevant they find such feedback, and whether they act on it to change their behaviour (Chickering and Gamson 1987, Kuh *et.al.* 2005, Pascarella and Terenzini 2005, 1991).

- Clear Sense of Destination. This topic reflects the extent to which the institution or programme has provided students with an explicit path or direction toward successful completion of their studies including knowledge of important requirements that must be met, deadlines, the availability of tutorial or other support, alternative pathways if these are available, and exit requirements with respect to examinations or capstones. Also included is the extent to which exit competencies or outcomes are clearly presented and are reported to be understood (Tinto 1993, Kuh *et.al.* 2005).

- Incentives to Do Well. This topic addresses student perceptions of particular stimuli motivating them to succeed academically including minimum requirements for progress within the academic programme, the relationship between graded/marked performance in particular classes and on particular assignments and later academic placement or participation in valued advanced components of study (for example, access to valued internships or faculty mentors), or the relationship between undergraduate academic performance and future graduate school selection and labour market outcomes (employment, advancement, and salary).

- Quality of Relationships. This topic examines student perceptions of the quality of their interactions with teaching staff, support staff, and other students from the perspective of the extent to which these interactions support both their academic success and their motivation to complete their course of study (Kuh *et.al.* 2005).

- Experiences with Technology. This topic addresses students' reported interaction with technology as an aid to learning such as the use of email, the Internet, classroom management software, electronic portfolios, or distance-education technologies to transmit content, support collaboration, provide opportunities for practice and drill, submit assignments or complete assessments and receive feedback.

Psycho-Social and Cultural Attributes

National System of Higher Education

- Competitiveness and Rankings. This topic embraces the cultural climate of competition among HEIs within the nation's tertiary education system including such matters as the extent to which

there are elite and non-elite institutions (as well as their degree of perceived separation and the basis on which such distinctions are made) and the role of rankings and competition for prestige and students among HEIs. A central focus here, in essence, is the extent to which institutions are "comfortable" with their assigned place in the nation's tertiary system or seek to attain a more selective or prestigious position (Clark 1987).

- Expectations about Participation. This topic addresses national cultural norms about who should participate in tertiary study including an explicit emphasis on raising the proportion of tertiary credentials among the country's young adult population, whether or not the participation rates of first-generation or traditionally underserved populations should be encouraged, and norms about how students are viewed with respect to how they pay for and sustain participation (for example as independent self-supporting actors, as part of a family unit, as workers-in-training identified with a particular employment community, *etc.*).

- Intrinsic Value of Academics. This topic examines general public attitudes toward the academy including the extent to which the academy is intrinsically valued as an institution/cultural icon and the perceived value of tertiary study to the society. A particular area of interest here is the extent to which achieving large proportions of tertiary credentials among citizens might be valued as an end in itself by broad segments of the population, even though there is no economic need for these levels of production or if the resulting credentials are awarded in fields that do not match anticipated labour markets (Clark 1987).

- Social Expectations of HEIs. This topic examines the extent to which the national system of higher education places a premium on institutions engaging explicitly in public service like applied research or technical assistance to a professional community or the region in which they are located, cultural contributions, or shared resource development with regional or professional organisations.

Institution

- Tradition and Prestige. This topic centers on the "aura" associated with the institution within the national and international academic community (as well as among external opinion leaders) based on its history, specific traditions, the prominence of its graduates, and its perceived wealth and influence.

Academic Unit

- Prestige/International Recognition. This addresses the place of the academic unit and its associated programmes in the national and international prestige hierarchy—especially within the discipline, but also including more general influential stakeholder perceptions. It might also include delineation of specific reputational areas or distinctive areas of perceived strengths within these communities.

- Status of Undergraduate Teaching. This examines established norms about the undergraduate programme and its status within the academic unit including the degree to which there is an expectation that high-ranking staff will teach undergraduate classes (especially at the lower division), whether lower division teaching assignments are routinely bought out in favor of upper-division/graduate or research assignments, and the extent to which graduate students are encouraged to learn more about and participate in undergraduate teaching.

- Orientation toward Student Success. This addresses the overall teaching philosophies that govern the unit's undergraduate programme including the extent to which there is an expectation that students are primarily responsible for their own academic achievement versus a belief that student success is a joint faculty-student responsibility. A curricular philosophy associated with the former is that high failure rates in early undergraduate courses are useful in "weeding out" students who should not continue, in contrast to a belief that all students can and should succeed in these courses with the proper preparation and support (Kuh *et.al.* 2005).

- Goals/Priorities/Challenges. This examines the major goals and aspirations for the academic unit—for example will priority be placed on pursuing research objectives, teaching quality, or other areas of endeavor, or the top two mid-range (*e.g.* three to five years) for the unit. Similarly, it addresses the most important perceived challenges identified by the unit's leadership, which can shape the importance attached to undergraduate teaching and learning.

Individual Student

- Motivation. This includes general motivation to succeed as well as the extent to which the student intrinsically values academic pursuits and success as opposed to simply engaging in tertiary study because of its extrinsic labour market rewards. At the behavioural level, it embraces such attributes as an orientation toward maximizing or "satisficing" with respect to passing examinations and earning good grades, which may vary by subject.

- Self-Confidence. This addresses the extent to which the student expects academic success, based on generally high levels of self-confidence, reinforced by a past history of academic success (Tinto 1993).

- Career Expectations. This addresses more specific career expectations including the type and level of eventual employment the student hopes to achieve, graduate school attendance, expectations for professional advancement, and whether or not the profession or discipline is seen as a long-term commitment.

- Motives for Selecting Programme. This examines the student's potential commitment to a current course of study by examining the reasons why she or he chose to enter it including reputation, affordability, convenience, or the availability of particular curricular features or subspecialties. It should place particular priority on determining whether the programme was the student's first choice for attendance.

- Social Support. This examines the student's perceptions of support and involvement in tertiary study through participation in social networks related to the programme and feelings of "connectedness" fostered by extra-curricular activities organised by the institution or academic unit (Kuh *et.al.* 2007, Smith *et.al.* 2004, Tinto 1993).

- Parental and External Peer Support. This examines the student's perceptions of support for continued enrolment and academic success on the part of parents, friends, and peers outside the institution (Kuh *et.al.* 2005).

Outcomes

Institution

- Completion/Persistence Rates. While not cognitive outcomes, institutional persistence and completion rates may constitute valuable indirect indicators of quality, as well as helping construct an overall contextual picture of the undergraduate student experience. Wherever possible, emphasis should be placed on persistence through the early years of study where students most typically withdraw (Tinto 1993). Rates should ideally be constructed on a cohort basis, but will be subject to limitations on the different levels of availability of such data in different national systems.

- Employment. Employment is another indirect indicator of success. It should ideally include both field of employment and levels of compensation. This topic might also explore students' experiences in seeking and gaining initial employment, including any support for doing so provided by the institution.

- Further Study. Graduate study is yet another indirect indicator of success and should include both discipline and expected degree (*e.g.* Master's, professional, doctoral). This topic might also explore students' experiences in seeking and gaining graduate placement, including any support for doing so provided by the institution.

Academic Unit

- Programme Completion/Persistence Rates. While not cognitive outcomes, programme persistence and completion rates may constitute valuable indirect indicators of quality, as well as helping construct an overall contextual picture of the undergraduate student experience. Wherever possible, emphasis should be placed on persistence through the early years of study where students most typically withdraw. Rates should ideally be constructed on a cohort basis, but will be subject to limitations on the different levels of availability of such data in different national systems.

- Employment within Field. Employment within field is another indirect indicator of success for an academic unit's undergraduate programmes. It should ideally include both type of appointment (*e.g.* level of entry) and levels of compensation. This topic might also explore students' experiences in seeking and gaining initial employment, including any support for doing so provided by the academic unit.

- Further Study within Field. Graduate study within the discipline is yet another indirect indicator of success and should include the type of institution (*e.g.* reputation, selectivity), type of programme (*e.g.* theoretical or applied), and expected degree (*e.g.* Masters, professional, doctoral). This topic might also explore students' experiences in seeking and gaining graduate placement, including any support for doing so provided by the academic unit.

- Graduate Rates of Return. This addresses the extent to which graduates of the undergraduate programme in general experience a high rate of return on their investments in time and resources in the form of long-term job and salary prospects, career mobility, and other factors. Evidence about this will likely only be available in some countries through previously accomplished research studies and will vary substantially based on labour market conditions.

- Faculty-Reported Outcomes. This topic addresses the perceptions of teaching staff about the quality of various student learning outcomes that graduates of the programme, in general, achieve. While staff reports about cognitive outcomes can be used to supplement the results of direct assessment and should be treated with caution, teaching staff may be in an especially good position to provide partial insights into such non-cognitive outcomes as motivation, identification with the field, practice-orientation, teamwork, and international orientation.

Individual Student

- Self-Reported Outcomes. Student reports on their own attainment of particular learning outcomes (both absolute levels of current ability and the perceived improvement of these levels since entering the programme) can serve as valuable proxy indicators of student academic achievement. The specific topics about which self-reports should be sought should be aligned with both the intended learning outcomes of the academic programme and the abilities examined in AHELO assessments (Kuh 2004, Pace 1979).

- Civic Engagement. This is an important non-cognitive area of student development that embraces attitudes toward making civic contributions to the student's nation and community, social efficacy and expectations of making a difference, and volunteer contributions of time and resources to public and civic causes.

- Satisfaction. While not directly academic, students' satisfaction with their programme toward the end of an undergraduate career can serve as a proxy indicator for academic success. It is most effectively determined by a student's reported likelihood of enrolling in the programme again or recommendations to a friend about whether or not to enroll in the programme, in addition to straightforward question about "satisfaction."

- Post-Graduate Plans. These include the student's self-reported plans about activities after completing the undergraduate programme that, in the absence of actual behaviours, can be used as proxies for these behaviours. The most important such plans include employment in field and graduate school attendance (Allen, Inenaga, Velden, and Yoshimoto 2007; Teichler 2007).

- Perceived Return on Investment. This addresses the extent to which the student believes that his or her investments of resources and time in the academic programme will pay off in the long run in terms of increased earnings, career advancement and mobility, and overall quality of life.

APPENDIX C: EXPERT PANEL RATINGS OF IDENTIFIED TOPICS

After identifying the range of potential contextual topics presented in Table 1 and further elaborated in Appendix B, members of the expert panel prioritised these topics to provide guidance for designing data gathering instruments. With appropriate topics assigned to potential sources of evidence in Table 1, members of the panel assigned votes to each topic to indicate priority within each source of evidence. Votes were arrayed on a three-point scale (3=important priority, 2=somewhat important priority, 1=useful but lesser priority), with a quota established to govern the number of top-ranked votes that could be awarded by any one panel member. Votes were then averaged across the eight-member panel. The result was a rank-ordered list of topics within each potential source of evidence that can be used to inform more detailed discussions of instrument design later on in the project.[4] These results are displayed in Tables 2-5 below.

[4] For reasons of time, entries in the tables provided in this Appendix use an earlier list of brainstormed topics that do not directly correspond to the topical headings in Table 1. In Table 1, redundancies across topics were eliminated and the number of entries reduced.

Table 2. Results of Prioritizing Topics Collected Through Document Review

SubTopic	Ranking 3=Highest; 1=Lowest Max = 25 for Highest Designation	Scored Average
Char-Inst	· Institutional type (highest degree level, research/teaching/vocational orientation, national/regional orientation)	3.00
Char-Unit	· Student characteristics (SES background, disadvantaged groups, international, gender, % mature and part-time students, levels of preparation and heterogeneity of student preparation)	3.00
Char-Inst	· Student characteristics (SES background, disadvantaged groups, international, gender, % mature and part-time students, levels of preparation and heterogeneity of student preparation)	2.86
Char-Nat	· Types of HEIs (public/private patterns, hierarchical/horizontal system, expected research products, teaching/research orientation)	2.86
Char-Nat	· Transition characteristics from 2ary to 3ary (% going into 3ary, degree of student choice, degree of HEI choice, role of national examinations…)	2.86
Char-Nat	· Student characteristics	2.86
Char-Nat	· Is there a national systematic sorting of students and faculty across HEIs (hierarchy)?	2.86
Char-Unit	· Size (enrolment, faculty)	2.86
Char-Unit	· Selectivity	2.86
Char-Inst	· Size (enrolment, faculty)	2.71
Char-Inst	· Financial resources (sources, size, financial autonomy if varies within a country, budgetary philosophy – each tub on its own bottom, incentive-funding, research funding, additional sources of revenues - endowments)	2.71
Char-Nat	· Volume of 3ary participation	2.71
Char-Inst	· Selectivity	2.57
Char-Inst	· Degree and disciplinary mix (cross-disciplinary)	2.57
Char-Nat	· QA system (accountability requirements)	2.57
Char-Unit	· Financial resources (sources, size, financial autonomy if varies within a country, budgetary philosophy – each tub on its own bottom, incentive-funding, research funding, additional sources of revenues - endowments)	2.57
Char-Unit	· Research emphasis	2.57
Char-Inst	· Teaching staff (qualifications, origins, contracts, experience,% international staff, time allocation to teaching/research)	2.43
Char-Inst	· Research emphasis	2.43
Char-Nat	· Funding patterns (student support system, central govt support to research)	2.43
Char-Nat	· Governance (degrees of freedom in the way HEIs operate)	2.43
Char-Nat	· Capacity of system to accommodate massification	2.43
Char-Unit	· Drop-out/completion rates	2.43
Char-Unit	· Teaching staff (qualifications, origins, contracts, experience,% international staff, time allocation to teaching/research)	2.43
Char-Inst	· Environment (metropolitan/rural, residential/commuter)	2.29
Char-Nat	· Transition between HEIs (flexible or not)	2.29
Educ-Nat	· National curricula?	2.29
Educ-Nat	· Qualification framework (outcomes explicitly prescribed?)	2.29
Char-Inst	· Infrastructure and facilities (libraries, equipment, technology, labs)	2.14
Char-Inst	· Internal QA policies and practices (programme review, teaching staff evaluation, student learning outcomes assessments)	2.14
Char-Nat	· Degree of import and export of students	2.14
Char-Nat	· Role of teaching qualifications in HE process (min requirements)	2.14
Char-Nat	· Relative emphasis on generic and discipline-specific learning outcomes	2.14
Char-Unit	· Infrastructure and facilities (libraries, equipment, technology, labs)	2.14
Char-Unit	· Internal QA policies and practices (programme review, teaching staff evaluation, student learning outcomes assessments)	2.14
Educ-Inst	· Role of teacher quality and assessment in recruitment, tenure and promotion	2.14
Educ-Inst	· Construction of curriculum (small/long courses, hierarchy, parallel/sequential, uniformity - general education requirement/student choice)	2.14
Out-Inst	· Graduate/professional school attendance (further study)	2.14
Out-Unit	· Completion/persistence rates within major	2.14
Out-Unit	· Performance on exit exam, graduate placement exam, licensure exam, GPA within field	2.14
Psy-Nat	· Role of competitiveness and ranking (role of elite HEIs)	2.14
Char-Inst	· Drop-out/completion rates	2.00
Char-Unit	· Autonomy/decision latitude	2.00
Educ-Inst	· Assessment culture (assignments, multiple choices, how are student tested?, graduation conditions – comprehensive exam/thesis, progress to degree - intermediate)	2.00
Educ-Unit	· Role of teacher quality and assessment in recruitment, tenure and promotion	2.00
Educ-Unit	· Assessment culture (assignments, multiple choices, how are student tested?, graduation conditions – comprehensive exam/thesis, progress to degree - intermediate)	2.00
Out-Inst	· Completion/persistence rates with emphasis on early persistence (institution self-report)	2.00
Out-Unit	· Employment placement (sector, level, occupation, preparedness)	2.00
Out-Unit	· Graduate/professional school attendance within field	2.00
Out-Unit	· Salary of graduates/rates of return (subject to constraints by the labour market)	2.00
Psy-Inst	· Prestige, history, tradition of HEI	2.00
Educ-Nat	· Quality of teaching force and generation of new teachers (allocation of different types of instructors to different types of HEIs, status of teachers/role of tenure)	1.86
Educ-Unit	· Construction of curriculum (small/long courses, hierarchy, parallel/sequential, uniformity - general education requirement/student choice)	1.86
Out-Unit	· Faculty-reported student outcomes (cognitive and non-cognitive skills)	1.86
Educ-Inst	· Integration of new students (first-year seminar, immersion in new culture)	1.71
Educ-Nat	· Expectations about the level at which generic skills are to be developed (2ary/3ary or within 3ary)?	1.71
Educ-Unit	· Special/additional requirements for graduation (thesis, internship, comprehensive exam)	1.71
Out-Inst	· Employment (support for gaining employment)	1.57
Psy-Nat	· Philosophy (student = part of a family, independent, how HE is funded – work)	1.57
Psy-Nat	· Social expectations of HEIs (regional & cultural contributions, public service)	1.57
Char-Stud	· Work experience/maturity	1.43
Psy-Nat	· Expectation of HE participation (first generation)	1.43
Psy-Nat	· Is academics/intellectualism valued (tolerating overproduction of degrees)	1.43

Table 3. Results of Prioritizing Topics Collected Through Leadership Surveys

SubTopic	Ranking 3=Highest; 1=Lowest Max = 50 for Highest Designation	Scored Average
Char-Inst	· Research emphasis	3.00
Char-Inst	· Selectivity	2.71
Char-Inst	· Student characteristics (SES background, disadvantaged groups, international, gender, % mature and part-time students, levels of preparation and heterogeneity of student preparation)	2.71
Char-Unit	· Student characteristics (SES background, disadvantaged groups, international, gender, % mature and part-time students, levels of preparation and heterogeneity of student preparation)	2.71
Char-Unit	· Research emphasis	2.71
Char-Unit	· Research ambition, competitiveness and productivity	2.71
Educ-Inst	· Role of teacher quality and assessment in recruitment, tenure and promotion	2.71
Educ-Unit	· Teaching culture (mission statement, pedagogical norms and practices – lectures/seminars/projects, HEI vs student responsibility for progress, memorization vs higher order, efforts towards a common philosophy)	2.71
Psy-Inst	· Prestige, history, tradition of HEI	2.71
Psy-Unit	· Goals and priorities of unit/dept (top 2 objectives: research, teaching quality?)	2.71
Char-Stud	· Preparedness for HE study	2.57
Char-Unit	· Selectivity	2.57
Char-Unit	· Drop-out/completion rates	2.57
Educ-Inst	· How the HEI handles the problem of student unpreparedness (support services)	2.57
Educ-Inst	· Construction of curriculum (small/long courses, hierarchy, parallel/sequential, uniformity - general education requirement/student choice)	2.57
Educ-Inst	· Student support services (tutoring, writing centers, academic advising, counseling, support for special groups – new students/international/learning disabled/immigrant populations)	2.57
Educ-Unit	· Role of teacher quality and assessment in recruitment, tenure and promotion	2.57
Out-Unit	· Completion/persistence rates within major	2.57
Out-Unit	· Employment placement (sector, level, occupation, preparedness)	2.57
Out-Unit	· Graduate/professional school attendance within field	2.57
Psy-Nat	· Role of competitiveness and ranking (role of elite HEIs)	2.57
Psy-Unit	· Status of undergraduate teaching within unit (do big names teach undergraduates?)	2.57
Char-Inst	· Institutional type (highest degree level, research/teaching/vocational orientation, national/regional orientation)	2.43
Char-Inst	· Size (enrolment, faculty)	2.43
Char-Inst	· Degree and disciplinary mix (cross-disciplinary)	2.43
Char-Inst	· Drop-out/completion rates	2.43
Char-Inst	· Teaching staff (qualifications, origins, contracts, experience,% international staff, time allocation to teaching/research)	2.43
Char-Inst	· Internal QA policies and practices (programme review, teaching staff evaluation, student learning outcomes assessments)	2.43
Char-Inst	· Teaching load and student credit load	2.43
Char-Unit	· Size (enrolment, faculty)	2.43
Char-Unit	· Financial resources (sources, size, financial autonomy if varies within a country, budgetary philosophy – each tub on its own bottom, incentive-funding, research funding, additional sources of revenues - endowments)	2.43
Char-Unit	· Teaching staff (qualifications, origins, contracts, experience,% international staff, time allocation to teaching/research)	2.43
Char-Unit	· Staff-student ratio	2.43
Educ-Inst	· Teaching culture (mission statement, pedagogical norms and practices – lectures/seminars/projects, HEI vs student responsibility for progress, memorization vs higher order, efforts towards a common philosophy)	2.43
Educ-Inst	· Integration of new students (first-year seminar, immersion in new culture)	2.43
Educ-Nat	· Expectations about the level at which generic skills are to be developed (2ary/3ary or within 3ary)?	2.43
Educ-Stud	· Incentives to do well (high expectations, min threshold, role of grades in the labour market)	2.43
Educ-Unit	· Assessment culture (assignments, multiple choices, how are student tested?, graduation conditions – comprehensive exam/thesis, progress to degree - intermediate)	2.43
Educ-Unit	· Academic challenge	2.43
Educ-Unit	· Construction of curriculum (small/long courses, hierarchy, parallel/sequential, uniformity - general education requirement/student choice)	2.43
Educ-Unit	· Use of graduate teaching assistants/adjunct faculty	2.43
Educ-Unit	· Norms and expectations for teaching and learning-enhancing practices	2.43
Educ-Unit	· Student-faculty interaction	2.43
Out-Inst	· Graduate/professional school attendance (further study)	2.43
Psy-Unit	· Early courses weeds students out (are high failure rates good or bad?)	2.43

Table 3. Results of Prioritizing Topics Collected Through Leadership Surveys - Continued

SubTopic	Ranking 3=Highest; 1=Lowest Max = 50 for Highest Designation	Scored Average
Char-Inst	· Infrastructure and facilities (libraries, equipment, technology, labs)	2.29
Char-Unit	· Internal QA policies and practices (programme review, teaching staff evaluation, student learning outcomes assessments)	2.29
Char-Unit	· Teaching load and student credit load	2.29
Char-Unit	· Student demand for this unit/department, selectivity of unit	2.29
Char-Unit	· Availability of, and transition to next cycle (does the unit offer a master or higher degree?)	2.29
Char-Unit	· Purpose of degree with respect to employment (employability in the field/purpose of bachelors' level attainment)	2.29
Educ-Inst	· Academic challenge	2.29
Educ-Nat	· Quality of teaching force and generation of new teachers (allocation of different types of instructors to different types of HEIs, status of teachers/role of tenure)	2.29
Educ-Unit	· How the HEI handles the problem of student unpreparedness (support services)	2.29
Educ-Unit	· Integration of new students (first-year seminar, immersion in new culture)	2.29
Educ-Unit	· Are generic and discipline-specific learning outcomes specified/measured?	2.29
Out-Inst	· Completion/persistence rates with emphasis on early persistence (institution self-report)	2.29
Out-Inst	· Employment (support for gaining employment)	2.29
Psy-Nat	· Expectation of HE participation (first generation)	2.29
Psy-Nat	· Is academics/intellectualism valued (tolerating overproduction of degrees)	2.29
Psy-Unit	· Perceived greatest challenges/problems of dept	2.29
Char-Inst	· Financial resources (sources, size, financial autonomy if varies within a country, budgetary philosophy – each tub on its own bottom, incentive-funding, research funding, additional sources of revenues - endowments)	2.14
Char-Inst	· Autonomy/decision latitude	2.14
Char-Unit	· Governance (curriculum, autonomy, licensure, autonomy in recruitment of students)	2.14
Educ-Inst	· Assessment culture (assignments, multiple choices, how are student tested?, graduation conditions – comprehensive exam/thesis, progress to degree - intermediate)	2.14
Educ-Inst	· Norms and expectations for teaching and learning-enhancing practices	2.14
Educ-Inst	· Are generic learning outcomes specified/measured?	2.14
Educ-Unit	· Teaching and learning-enhancing practices (lab work, emphasis on group and team work, interdisciplinary groupwork for engineering)	2.14
Educ-Unit	· Orientation within the discipline (e.g. emphasis on quantitative/problem-solving)	2.14
Educ-Unit	· Emphasis on applied vs theoretical work	2.14
Educ-Unit	· Special/additional requirements for graduation (thesis, internship, comprehensive exam)	2.14
Educ-Unit	· Class size of lectures, and availability of smaller group educational experiences	2.14
Out-Unit	· Performance on exit exam, graduate placement exam, licensure exam, GPA within field	2.14
Psy-Nat	· Philosophy (student = part of a family, independent, how HE is funded – work)	2.14
Psy-Nat	· Social expectations of HEIs (regional & cultural contributions, public service)	2.14
Psy-Unit	· Prestige and national/international recognition of department/unit (internal/external perception, within HEI/discipline)	2.14
Char-Inst	· Availability of a teaching and learning support centre (size, staffing, budget)	2.00
Char-Inst	· Cooperation with industry (internships, joint projects)	2.00
Char-Unit	· Role and importance within HEI	2.00
Char-Unit	· In-service training (opportunities outside academia, behaviours)	2.00
Educ-Inst	· Use of graduate teaching assistants/adjunct faculty	2.00
Educ-Stud	· Clear sense of destination (e.g. knows what outcomes are)	2.00
Educ-Unit	· Teaching mode (e-learning, distance, technology in the classroom)	2.00
Char-Inst	· Environment (metropolitan/rural, residential/commuter)	1.86
Char-Stud	· Specialisation within the discipline	1.86
Char-Stud	· Knowledge of and access to information about financial support	1.86
Char-Unit	· Autonomy/decision latitude	1.86
Char-Unit	· Availability of a teaching and learning support centre (size, staffing, budget)	1.86
Char-Unit	· Cooperation with industry (internships, joint projects)	1.86
Char-Unit	· Relationship with professional community (accreditation, participation of professionals in faculty and teaching, funding, co-teaching)	1.86
Char-Unit	· Degree of specialization within discipline (number of sub-disciplines offered)	1.86
Educ-Inst	· Teaching mode (e-learning, distance, technology in the classroom)	1.86
Educ-Nat	· Curriculum emphasis (content/generic skills)	1.86
Char-Unit	· Infrastructure and facilities (libraries, equipment, technology, labs)	1.71
Char-Unit	· Access to additional financial resources (special endowments, workforce endowments, grants)	1.71
Educ-Inst	· Learning experiences outside formal training	1.71
Out-Unit	· Salary of graduates/rates of return (subject to constraints by the labour market)	1.71
Char-Stud	· Participation in extra-curricular/service activities, student union, athletics	1.57
Educ-Unit	· Identification with a specific school of thought (ECON)	1.57

Table 4. Results of Prioritizing Topics Collected Through Faculty Surveys

SubTopic	Ranking 3=Highest; 1=Lowest Max = 20 for Highest Designation	Scored Average
Char-Unit	· Teaching staff (qualifications, origins, contracts, experience,% international staff, time allocation to teaching/research)	3.00
Educ-Unit	· Teaching culture (mission statement, pedagogical norms and practices – lectures/seminars/projects, HEI vs student responsibility for progress, memorization vs higher order, efforts towards a common philosophy)	3.00
Char-Unit	· Research emphasis	2.86
Char-Unit	· Research ambition, competitiveness and productivity	2.86
Educ-Unit	· Assessment culture (assignments, multiple choices, how are student tested?, graduation conditions – comprehensive exam/thesis, progress to degree - intermediate)	2.86
Psy-Unit	· Early courses weeds students out (are high failure rates good or bad?)	2.86
Char-Stud	· Preparedness for HE study	2.71
Educ-Unit	· Student-faculty interaction	2.71
Out-Unit	· Faculty-reported student outcomes (cognitive and non-cognitive skills)	2.71
Psy-Unit	· Status of undergraduate teaching within unit (do big names teach undergraduates?)	2.71
Educ-Stud	· Quality of student effort (time on task: class attendance, preparation time, amount of reading and writing)	2.57
Educ-Stud	· Quality of relationships with students, faculties, staff	2.57
Educ-Unit	· Norms and expectations for teaching and learning-enhancing practices	2.57
Educ-Unit	· Emphasis on applied vs theoretical work	2.57
Char-Unit	· Teaching load and student credit load	2.43
Char-Unit	· In-service training (opportunities outside academia, behaviours)	2.43
Educ-Unit	· Are generic and discipline-specific learning outcomes specified/measured?	2.43
Educ-Unit	· Teaching and learning-enhancing practices (lab work, emphasis on group and team work, interdisciplinary groupwork for engineering)	2.43
Educ-Unit	· Orientation within the discipline (e.g. emphasis on quantitative/problem-solving)	2.43
Educ-Unit	· Class size of lectures, and availability of smaller group educational experiences	2.43
Educ-Stud	· Student-faculty interaction	2.29
Educ-Stud	· Academic challenge	2.29
Educ-Unit	· Teaching mode (e-learning, distance, technology in the classroom)	2.29
Char-Inst	· Research emphasis	2.14
Char-Unit	· Governance (curriculum, autonomy, licensure, autonomy in recruitment of students)	2.14
Char-Unit	· Relationship with professional community (accreditation, participation of professionals in faculty and teaching, funding, co-teaching)	2.14
Char-Unit	· Purpose of degree with respect to employment (employability in the field/purpose of bachelors' level attainment)	2.14
Educ-Inst	· Teaching culture (mission statement, pedagogical norms and practices – lectures/seminars/projects, HEI vs student responsibility for progress, memorization vs higher order, efforts towards a common philosophy)	2.14
Educ-Stud	· Prompt and meaningful feedback	2.14
Char-Inst	· Teaching staff (qualifications, origins, contracts, experience,% international staff, time allocation to teaching/research)	2.00
Char-Inst	· Teaching load and student credit load	2.00
Char-Unit	· Availability of a teaching and learning support centre (size, staffing, budget)	2.00
Char-Unit	· Cooperation with industry (internships, joint projects)	2.00
Char-Inst	· Internal QA policies and practices (programme review, teaching staff evaluation, student learning outcomes assessments)	1.86
Char-Unit	· Role and importance within HEI	1.86
Char-Unit	· Availability of, and transition to next cycle (does the unit offer a master or higher degree?)	1.86
Educ-Unit	· Identification with a specific school of thought (ECON)	1.86
Char-Inst	· Availability of a teaching and learning support centre (size, staffing, budget)	1.71
Char-Stud	· Work experience/maturity	1.71
Char-Unit	· Infrastructure and facilities (libraries, equipment, technology, labs)	1.71
Educ-Inst	· Assessment culture (assignments, multiple choices, how are student tested?, graduation conditions – comprehensive exam/thesis, progress to degree - intermediate)	1.71
Educ-Inst	· Norms and expectations for teaching and learning-enhancing practices	1.71
Educ-Inst	· Are generic learning outcomes specified/measured?	1.71
Educ-Nat	· Quality of teaching force and generation of new teachers (allocation of different types of instructors to different types of HEIs, status of teachers/role of tenure)	1.71
Char-Inst	· Infrastructure and facilities (libraries, equipment, technology, labs)	1.57
Char-Inst	· Cooperation with industry (internships, joint projects)	1.57
Educ-Inst	· Teaching mode (e-learning, distance, technology in the classroom)	1.57
Char-Inst	· Autonomy/decision latitude	1.43
Char-Inst	· Environment (metropolitan/rural, residential/commuter)	1.33

Table 5. Results of Prioritizing Topics Collected Through Student Surveys

SubTopic	Ranking 3=Highest; 1=Lowest Max = 20 for Highest Designation	Scored Average
	Institution	
Char-Stud	· Student characteristics	3.00
Char-Stud	· Preparedness for HE study	2.86
Educ-Stud	· Quality of student effort (time on task: class attendance, preparation time, amount of reading and writing)	2.86
Educ-Stud	· Active and collaborative learning experiences (group projects, making presentations, learning communities and stability of student group, research with faculty members, informal group interactions)	2.86
Out-Stud	· Student satisfaction (with the overall institutional experience, within field, would I choose the same HEI/degree again?)	2.86
Psy-Stud	· Motivation (motivation to succeed)	2.86
Educ-Stud	· Quality of relationships with students, faculties, staff	2.83
Educ-Stud	· Academic challenge	2.71
Educ-Stud	· Incentives to do well (high expectations, min threshold, role of grades in the labour market)	2.71
Educ-Unit	· Teaching and learning-enhancing practices (lab work, emphasis on group and team work, interdisciplinary groupwork for engineering)	2.71
Out-Stud	· Self-reported outcomes (cognitive and non-cognitive skills, and correspondence of cognitive self-reported LO with assessed LO)	2.71
Out-Stud	· Plans beyond graduation (further education, employment, other)	2.71
Psy-Stud	· Motives for selecting this HEI/field of study – was it my first choice?	2.71
Educ-Stud	· Clear sense of destination (e.g. knows what outcomes are)	2.57
Educ-Stud	· Prompt and meaningful feedback	2.57
Educ-Stud	· Reflective learning (connecting what you're learning to larger social issues, broader frame)	2.57
Psy-Stud	· Career expectation	2.57
Char-Stud	· Work experience/maturity	2.43
Char-Stud	· Participation in extra-curricular/service activities, student union, athletics	2.43
Educ-Stud	· Student-faculty interaction	2.43
Educ-Stud	· Learning strategies (pass exam, strategic, understanding the subject)	2.43
Educ-Unit	· Class size of lectures, and availability of smaller group educational experiences	2.43
Psy-Stud	· Self-confidence	2.43
Psy-Stud	· Personality traits	2.43
Char-Stud	· Knowledge of and access to information about financial support	2.29
Educ-Stud	· Peer effects	2.29
Educ-Stud	· Integrative learning experiences (connections across courses, between course and work etc.)	2.29
Educ-Unit	· Academic challenge	2.29
Out-Stud	· Perceived value for money	2.29
Psy-Stud	· Parental and peer support	2.29
Educ-Stud	· Experiences with technology as a vehicle for learning (whether it enhances or inhibits all of the above)	2.14
Educ-Unit	· Teaching mode (e-learning, distance, technology in the classroom)	2.14
Educ-Unit	· Student-faculty interaction	2.14
Out-Stud	· Civic engagement	2.14
Psy-Unit	· Status of undergraduate teaching within unit (do big names teach undergraduates?)	2.14
Char-Unit	· Teaching load and student credit load	2.00
Educ-Inst	· Student support services (tutoring, writing centers, academic advising, counseling, support for special groups – new students/international/learning disabled/immigrant populations)	2.00
Educ-Unit	· Use of graduate teaching assistants/adjunct faculty	2.00
Educ-Unit	· Are generic and discipline-specific learning outcomes specified/measured?	2.00
Psy-Stud	· Students' social life	2.00
Psy-Unit	· Early courses weeds students out (are high failure rates good or bad?)	2.00
Char-Unit	· Infrastructure and facilities (libraries, equipment, technology, labs)	1.86
Educ-Inst	· Academic challenge	1.71
Educ-Unit	· Integration of new students (first-year seminar, immersion in new culture)	1.71
Char-Unit	· Availability of, and transition to next cycle (does the unit offer a master or higher degree?)	1.57
Educ-Inst	· Integration of new students (first-year seminar, immersion in new culture)	1.57
Educ-Inst	· Use of graduate teaching assistants/adjunct faculty	1.57
Educ-Inst	· Teaching mode (e-learning, distance, technology in the classroom)	1.57
Educ-Inst	· Learning experiences outside formal training	1.57
Char-Inst	· Infrastructure and facilities (libraries, equipment, technology, labs)	1.43
Educ-Inst	· Are generic learning outcomes specified/measured?	1.43
Char-Inst	· Teaching load and student credit load	1.29
Psy-Nat	· Philosophy (student = part of a family, independent, how HE is funded – work)	1.00

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