

GUIDELINES TO GOOD PRACTICES: ASSESSMENT OF STUDENTS

1. Introduction

The Guidelines to Good Practices: Assessment of Students (GGP: AS) is a document developed to assist Higher Education Providers (HEPs) to meet the standards on the item Assessment of Students, marked as Area 3 of the Code of Practice for Programme Accreditation (COPPA) and the Code of Practice for Institutional Audit (COPIA). The document is part of a series of seven such guidelines that are similarly designed to assist HEPs implement the practices and standards listed in COPPA and COPIA (the Codes). COPPA is concerned with the practices applied by HEPs in curriculum design and delivery, whilst COPIA is primarily concerned with institutional processes that are applied in curriculum development and delivery. Both for programme accreditation and institutional audit, the assessors' concerns are primarily with the procedures and practices adopted by the institutions in the areas covered by the Codes, and whether these match the provisions of the Codes.

HEPs are discouraged **from simply copying the guidelines and samples given in the Appendices. Instead, HEPs must strive to develop their own curriculum design and delivery processes and assessment which best fit the needs and requirements of the HEP and its students.** In doing so, HEPs are expected to keep abreast with latest developments in the disciplines they offer.

This document, *Guidelines to Good Practices for Assessment of Students (GGP: AS)*, is premised on the fact that assessment is integrated with and cannot be separated from student learning. Furthermore, research (see for example, Biggs, 2003) suggests that assessment drives student learning and directly influences students' approaches to study. For example, if assessment tasks for a particular programme and course require students to only reproduce or regurgitate information, then students will study only to reproduce information.

The purpose of higher education begins with graduates being able to reproduce knowledge of terminologies, language, concepts, principles, theories, criteria and processes required for familiarisation with the discipline. This knowledge is the basis for learning experiences that nurture deep understanding of the subject matter. More importantly, the purpose of higher education is to develop in

students the ability to use their deep understanding so that they can identify, clarify and provide viable solutions to issues that concern the individual, the workplace, society and the country.

As stated earlier, the purpose of GGP: AS is to complement Area 3, Assessment of Students (see Figure 1) of the Malaysian Qualifications Agency (MQA) *Code of Practice for Programme Accreditation (COPPA)*. It outlines best assessment practices and is applicable for all disciplines, programmes, courses and institutions. However, the Guidelines do not consider the assessment of masters and doctoral degree by research. While the Guidelines are general in nature, HEPs should consider them in the context of their own institution and programmes. They also need to be considered in relation to the *Description of Qualification Levels*, as outlined in the Malaysian Qualifications Framework (MQF, 2007).

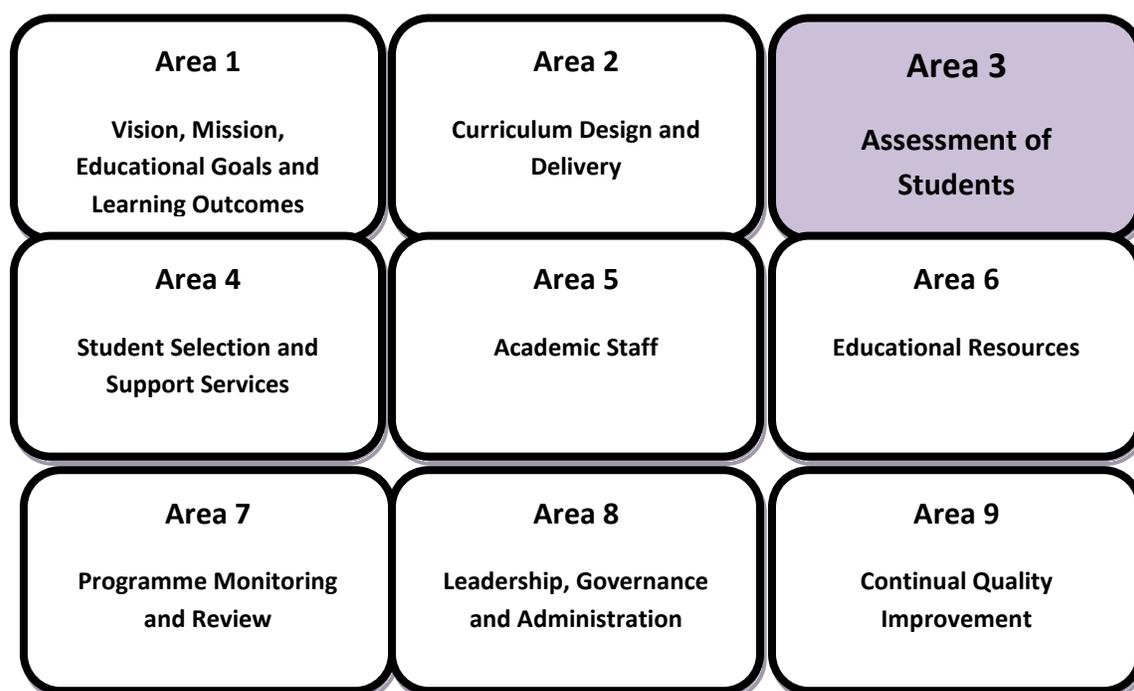
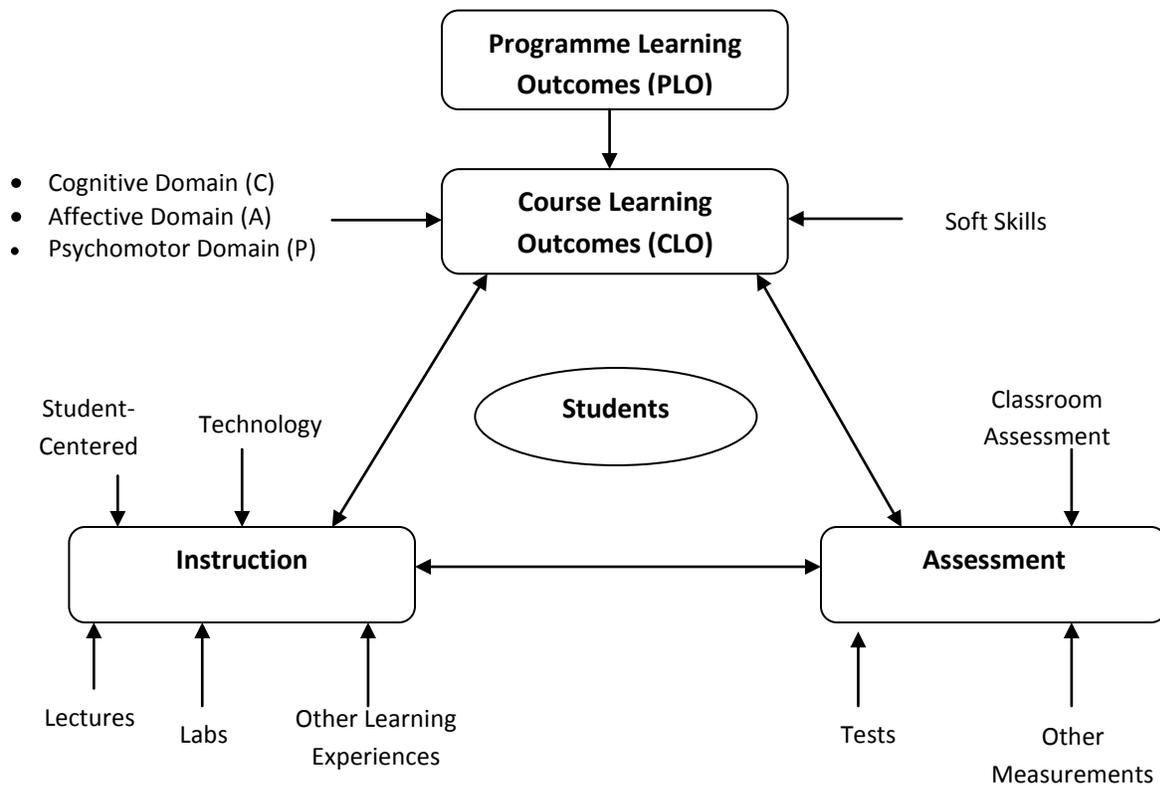


Figure 1: The Nine Malaysian Quality Assurance Areas

Figure 2 shows the role of assessment and learning and teaching activities in the attainment of outcomes. Since assessment is an integral part of the learning and teaching process, assessment methods or the outcome indicators employed must be constructively aligned with the programme learning outcomes (PLOs) and course learning outcomes (CLOs). Ensuring this alignment will encourage

students to take learning approaches that will result in the achievement of the CLOs and hence assist the attainment of the PLOs.



**Soft skills can be classified under the affective domain*

Figure 2: Relationship between Design, Delivery and Assessment

Adapted from Felder, R. M. & Brent, R. (2003). Designing and Teaching Courses to Satisfy the ABET Engineering Criteria. *Journal of Engineering Education*, 92 (1), 7 - 25.

This document covers the following areas:

- i. Relationship Between Assessment and Learning (Section 2);
- ii. Assessment Methods (Section 3); and
- iii. Management of Student Assessment (Section 4).

Figure 3 shows the relationship between the assessment of students and the attainment of CLOs and PLOs as the means to support the attainment of the programme educational objectives (PEO). It indicates the need to align assessment methods with attainment of the learning outcomes (LO) and the need for a systematic student assessment processes within the institution. The discussion provided in these guidelines addresses Area 3 of COPPA Standards, Assessment of Students.

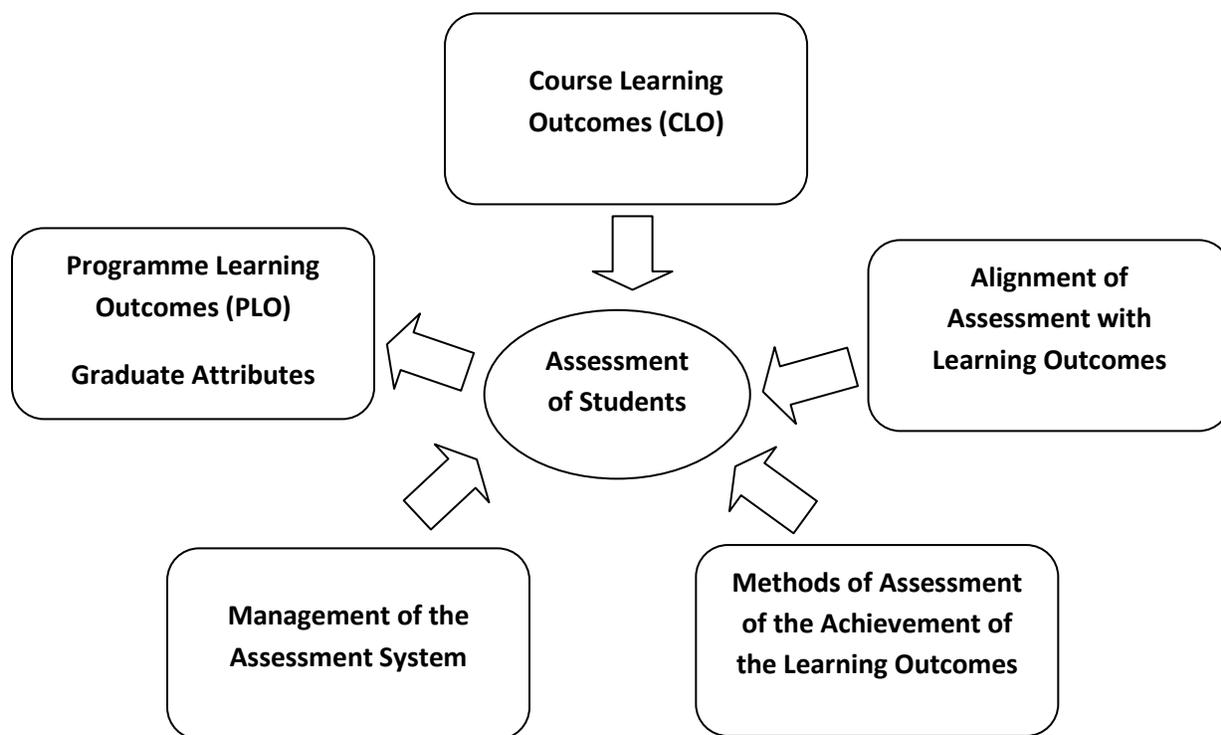


Figure 3: Assessment of Students and the Structure of the Guidelines

2. Relationship Between Assessment and Learning

Traditional educational practices centre on inputs where the content of the subject is merely delivered. Students are exposed to the curriculum, and at the end, an exam is given. Grades are assigned regardless to whether students have learned or not learned.

On the other hand, outcomes-based education (OBE) specifies the desirable outcomes students should be able to demonstrate upon participating in the educational programme. These desirable outcomes ensure that students will become effective adults.

2.1 Outcomes-Based Education and Domains of Learning

Assessment is a process of finding evidence that the LOs, which are the minimum performance or competence level, have been achieved when students have successfully completed a certain course or graduated from a certain programme offered by the HEP.

Assessing outcome achievement entails defining performance criteria and the performance standards for each of the outcome elements or outcome attributes specified in each LO. At the programme level, this means formulating PLOs that would indicate, minimally, what the students will know and be able to do upon completion of the programme. The PLOs must address the generic LOs outlined by the Ministry of Higher Education (MOHE) and MQA.

The PLOs must be aligned with the vision and mission of the HEP. In so doing, the programme aims and the PEOs need to be formulated. PEOs play an important role in that they enable evaluation of how graduates are contributing towards the society and industry within the first five years following their graduation. A systematic assessment approach is required for alignment of the PEOs and the PLOs with the HEPs vision and mission.

Student development in the three domains of learning or learning taxonomies is guided by hierarchical levels in each of the domains. These levels are typically used to define the minimum performance attainment on completion of a course and a programme. The most common classifications for the

- iii. determine whether a particular student is sufficiently well prepared in a subject area to proceed to the next level of instruction;
- iv. provide feedback to students which indicates levels of attainment and diagnoses misunderstandings and learning difficulties; and
- v. provide feedback to teaching staff to identify and diagnose ineffective teaching methods/ techniques.

Evidence of learning is obtained from assessing students' attainment of LOs, both formatively and summatively at the course level and at the programme level. Hence, at the programme level, a programme's impact is assessed by finding evidence of PLOs attainment. This means finding evidence that upon successful completion of the programme, each statement describing what students should know and be able to do in all the 3 domains of learning has been attained. Furthermore, since PLOs support achievement of PEOs and the programme aims, a programme's assessment plan must also include how its graduates are performing in their careers within five (5) years of graduation.

In conclusion, assessment of students is directly related to students' learning since assessment provides evidence of the degree and the standard of their learning attainment. Such evidence can only be captured by taking a systematic approach to assessment.

2.2 Outcomes-Based Assessment

In Outcomes-Based Assessment the assessment methods should be constructively aligned with achievement of the LOs. The assessment methods should also support the learners in their learning progress (formative assessment) and validate their achievement of the LOs at the end of the process (summative assessment). For example, if the LO for a student is to be able to explain about energy conservation in thermodynamic processes, then the assessment methods and tasks chosen must involve the students providing explanation about energy conservation in one or more thermodynamic processes.

Outcomes-Based Assessment is criterion-referenced, where the LOs are the criteria to be assessed. This contrasts with norm-referenced assessment, where students' achievements are compared with each other. When implemented at the course level, academic staff need to assess more than students merely

being able to reproduce or recall information. It requires that HEP academic staff shift their mindset from traditional content-based focus to achievement of LOs.

Outcomes-Based Assessment (OBA) involves choosing assessment tasks or instruments that are constructively aligned with attainment of the LOs. It also means choosing assessment methods and tasks that will support learners in their learning progress (formative assessment), and that will validate their achievement of the LOs at the end of the learning experiences (summative assessment).

Evidence gathered through OBA is used to judge how well the criteria specified by the LOs are attained. This evidence is not about how each student's performance quantitatively compares with another student or to the mean of a sample or of a population. Instead, OBA is a systematic assessment approach to find out how well students attain the intended CLOs and PLOs by holistically judging their LO attainment. This judgement requires HEP to focus on the outcomes-based assessment and the learner paradigm.

2.3 Aligning Assessment with Learning Outcomes

Assessment of students' learning involves collecting evidence of outcomes attainment both at the course and the programme level. These outcomes are driven by the programme aims and the PEOs. Hence, assessment of students' learning must involve using outcome indicators or assessment methods that include:

- i. indirect evidence of the programme's effectiveness in preparing graduates for their careers;
- ii. direct and indirect evidence that successful students have attained the competence level through attainment of the PLOs; and
- iii. evidence that the courses offered by the programme directly or indirectly support attainment of the PLOs.

In addition, assessment instruments and the assessment tasks used to collect evidence must be appropriately aligned to the attainment of the LOs. Figure 4 shows the flow of an assessment plan to find evidence of LO attainment and to determine the performance standard of that attainment, either at the course level or at the programme level.

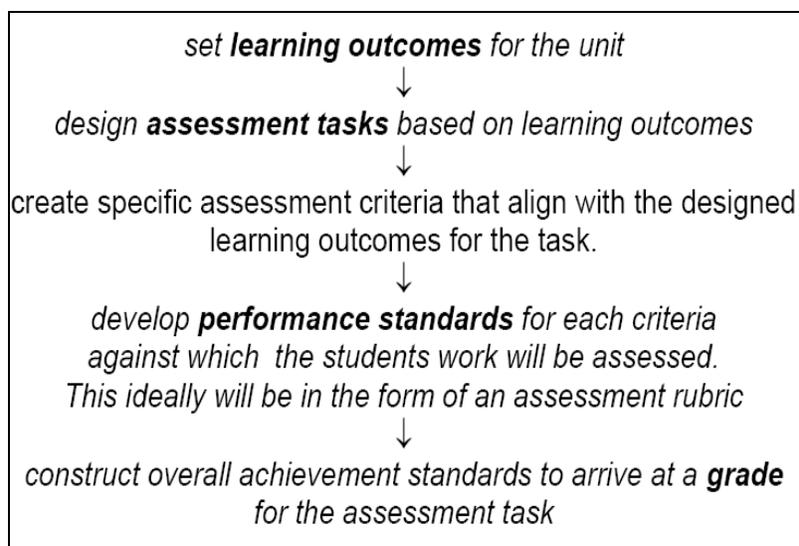


Figure 4: Flow of an assessment plan to find evidence and performance standard of LO attainment

Outcomes-Based Education (OBE) curriculum design starts with the determination of Programme Aim which outlines the philosophy, rationale and purpose for offering the programme. For example, the aim of offering a BSc (Hons.) in Information Technology could be:

The BSc in Information Technology aims to support Malaysia's aspirations of becoming an industrialised nation with knowledge-based society by nurturing internationally recognised, innovative, creative, ethical and responsible IT graduates with unwavering commitment and professionalism to support Malaysia's societal and economic growth.

While the programme aim may not be directly assessed by the HEPs, the programme's impact can be indirectly assessed through its attainment of the PEOs. Supporting the PEO attainment requires that successful graduates have attained the PLOs and therefore are already competent upon completion of the programme. Figure 5 indicates the assessment forward model compared to the design backwards model proposed by Wiggins (see for example, Wiggins & McTighe, 2005). Examples of which outcome indicators are used to assess PEO attainment and outcome indicators used to assess PLOs attainment are shown in Appendix 7 and Appendix 8.

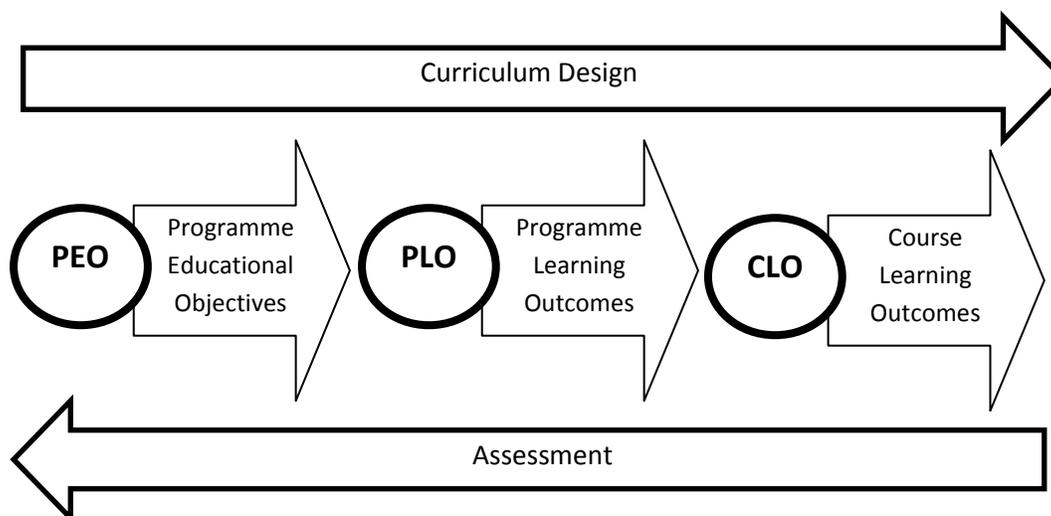


Figure 5: “Assessment Forward Model” compared with “Curriculum Design Backwards Model”

Courses are offered to indirectly and directly support the attainment of PLOs. These courses generally follow the progression that involves basic understanding and practical skills as well as higher order cognitive and affective skills. The CLOs for each course may range between three (3) and five (5). Hence, assessing student’s learning in a course may require assessment methods that are varied. Table 2 in this section shows examples of PEOs, PLOs, CLOs and some of the constructively aligned outcome indicators.

Table 2: Description and Examples of of PEOs and LOs along with Examples of Some Possible Constructively Aligned Assessment Methods or Outcome Indicators

	Programme Educational Objectives	Programme Learning Outcomes	Course Learning Outcomes
Definition	Broad statements that describe the career and professional accomplishments of graduates within 5 years upon graduation	The knowledge, skills, abilities, and attitudes that graduate should be able to demonstrate at the time of graduation.	Specific statements of what the learners are expected to achieve at the end of the course.
Example of Statement	IT instructors who apply fundamental knowledge, cognitive skills and practical skills in providing services to the IT industries locally and globally.	Students should be able to: 1. apply mathematics and science concepts, principles, theories and laws essential to IT; and	Students can: 1. explain differentiation and integration concepts, principles, and algorithm; 2. perform second order differentiation and

	Programme Educational Objectives	Programme Learning Outcomes	Course Learning Outcomes
		2. perform algorithm, programming and diagnostic procedures essential to IT.	triple integration techniques to determine slopes, sign of the slopes, area and volume of mathematical functions; and 3. support peers in the learning process.
Example of Statement	IT instructors who lead and effectively communicate with team members in solving workplace and professional issues.	Students should be able to: 3. demonstrate effective communication skills; 4. demonstrate effective teamwork in a multidisciplinary team; and 5. demonstrate leadership skills.	Students will be able to: 1. perform a 20-minute verbal presentation by utilising ICT technology; 2. support and respect team members' opinion and ideas during team-related tasks; and 3. demonstrate leadership skills in team-related tasks.
Examples of Assessment Methods / Outcome Indicators	<ul style="list-style-type: none"> • Alumni surveys • Alumni interviews • Employer surveys • Employer interview • Job offers, starting salaries (relative to national benchmarks). • Admissions to graduate school. 	<ul style="list-style-type: none"> • Entrance Survey • Exit survey • Exit interviews • Exit exam • Standardised test (eg. Graduate Record Examination – GRE, the Collegiate Learning Assessment (CLA) and the National Survey of Student Evaluation (NSSE) 	<ul style="list-style-type: none"> • Tests • Projects • Reports • Oral Presentation • Proposal • Summary • Critiques • Assignments • Journals • Portfolio

The assessment methods in Table 2 are only samples of methods that maybe employed to assess students' learning. Assessment methods chosen must be aligned with the process of finding evidence of the LOs attainment and must be consistent with the student learning time required to complete the task. They must also consider practical issues in the academic staff scoring and providing feedback for the purpose of promoting learning. For example, entrance and exit exams are appropriate to assess

growth in knowledge and understanding. Academic staff could consider using a portfolio to assess growth in students' technical and transferable skills. Standardised assessment instruments used worldwide to show attainment of undergraduate LOs are the Collegiate Learning Assessment (CLA) and the National Survey of Student Engagement (NSSE).

In addition to a variety of assessment methods and assessment instruments, construction of assessment items must also aim for students to show evidence of learning at the competency level specified by the action verbs used in the LO statements. These competency levels are guided by Bloom's revised Taxonomy, the SOLO taxonomy, Simpson's psychomotor domain and Krathwohl's affective domain, as have been discussed in the previous section.

2.4 Grading Criteria

Outcomes-based assessment procedures require academic staff and programme heads to move away from a quantitative and analytic view of students' knowledge attainment through averaging of marks from various assessment tasks, to practices that qualitatively and holistically make judgment of LO attainment. In outcomes-based grading, students' learning is demonstrated by their direct performance in the attainment of LOs or indirect performance in the assessment tasks used to collect evidence. Biggs (2003) considered assessment tasks (ATs) as the following:

- i. provide students the opportunity to demonstrate whether or not they have achieved the LOs and what level their performance is in those LOs;
- ii. provide evidence allowing academic staff to make a judgment about the level of a student's performance against the LOs and to award a final grade;
- iii. appropriately designed or selected to address the LOs that need to be assessed; and
- iv. different ATs address different LOs.

Grading assessment tasks that are aligned with the LOs will reveal attainment and performance of the LOs. Grading the LOs' attainment involves a holistic judgment on all the tasks. Hence, when deciding on course grade, academic staff and programme heads must first agree on whether to grade LO attainment or to grade assessment tasks and later infer attainment of LOs based on performance on the assessment

tasks. When determining or developing grading criteria (letter grade for an assessment task or for a course), the following characteristics are considered meaningful;

- i. **Consistent:** commonly understood and interpreted among academic staff utilising the same action verbs in the same LO domain at the same MQF qualifications level across courses and disciplines. This consistency in the meaning of grades should be systemic across institution and across all HEPs. Consistency infers generic criteria and generic descriptors of performance standards in the holistic rubric. For example, a grade of A for the LO domain-Communication in the foundation year, would infer students who have consistently shown exemplary non-verbal communication skills, good tone, pacing, pitching, volume, able to confidently and competently link most of the concepts, principles, criteria and processes.
- ii. **Accurate:** reliable and valid grades which reflect actual student achievement in relation to the LOs as described by the performance standards and validated by grades from multiple assessment tasks.
- iii. **Meaningful:** grades must communicate useful information to students and to all who are interested in or needing to know about their learning.
- iv. **Support Learning:** grades should motivate students to improve their performance.

3. Assessment Methods

Assessment may require direct examination or observation of students' displayed knowledge or skills, which can be assessed based on measurable LOs. Attainment of outcomes in the cognitive and psychomotor domains can be directly assessed, whilst those of the affective domain, soft skills and values may be more difficult to assess, resulting in a more subjective assessment. Direct assessments involve examining actual samples of student's work and these include exams, quizzes, reports, portfolios and presentations. On the other hand, indirect assessments refer to "analysis of reported perceptions about student mastery of learning outcome" (Allen, 2004). It may be in the form of employer surveys; exit interviews of graduates and self-reports by students or by others such as the supervisor during industrial attachment.

3.1 Planning Assessment Tasks

Attention has to be given in the planning of assessment tasks for students. In the rest of the section, discussion on assessment tasks focuses on the course LOs. This must be conducted throughout the course and academic staff must have a sound understanding of the assessment methods.

It is of utmost importance that assessment methods are aligned to both outcomes and the instructional delivery. Constructive alignment, a term coined by John Biggs (Biggs, 1999) posited that the curriculum is designed so that the learning activities and assessment tasks are aligned with the LOs that are intended in the course, resulting in a system that is consistent.

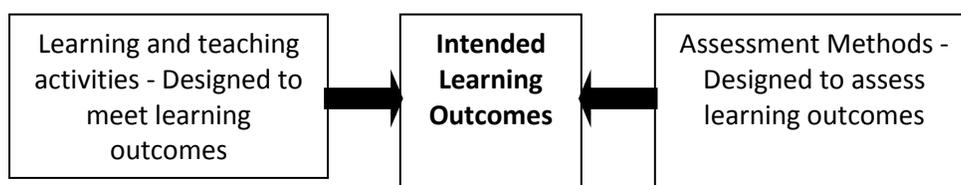


Figure 6: Aligning learning outcomes, learning and teaching activities and the assessment,q

Adapted from Biggs (1999) p. 27

For instance, in order to achieve a certain course's LOs, the case study or problem-based learning approach may be regarded as the most suitable. Thus, the teaching approach and activities chosen

would demand for rather specific methods of measuring those outcomes. To cater for the diversity in outcomes to be achieved, assessment methods chosen must be aligned to the teaching approaches. In conducting good practice in assessing course LOs, the following considerations need to be taken into account, but not limited to:

3.1.1 Communicating the assessment plan to students

The assessment plan should be communicated to students in writing at the beginning of the semester. Academic staff should provide the course description which includes a brief summary of the course topics and requirements, general format of the course, instructional materials and assessment methods, mark apportionment, and grading criteria and schedule for the assessments. Clear grading criteria such as rubrics and performance standard for the assessment of student work should be made available to students in hardcopy or electronic forms.

Academic staff should provide ongoing feedback on students' performance as the class progresses. They may provide feedback to the class following the completion and grading of continuous assessment tasks. This could include a summary of the student overall performance, as well as strategies for improvement.

3.1.2 Planning of Assessment

Planning of assessment tasks for a given course must take into account the level and the credit value of the course. Thus, academic staff must gauge whether the number and the complexity of the assignments to be given commensurate the credit load of the course. Expected time needed to complete a given assessment task must be based on the MQA's Guidelines for Good Practices: Curriculum Design and Delivery (GGP: CDD) for determining student learning time (SLT). For example, MQA has proposed that a 2000 words assignment would require 10 to 20 hours of SLT. Preparation time needed by students for every hour of test is also provided in the SLT guideline.

3.1.3 Diversity

Assessment tasks should provide opportunity for students to display their knowledge, talents, competencies and/or skills. Based on the LOs, each task has to be planned to determine the achievement of the outcome/s. The following table suggests tasks and grading instruments that may be used to measure various elements.

Table 3: Examples of Tasks and Grading Instruments for Assessing Various Elements

Elements to be Assessed	Examples of Outcomes to be Measured	Examples of Assessment Tasks	Suggested Grading Instruments
Creativity	Ability to generate new creation/ design e.g. unique, original, outstanding	<ul style="list-style-type: none"> • Creative project / product (art and design, architecture, engineering) • Performance (music, theatre) 	Rubric
Leadership	Ability to lead a group of students to undertake a project.	<ul style="list-style-type: none"> • Group project e.g. organising an event, conducting mini research • Presentation • Debate 	Rubric
Critical thinking and problem solving	Ability to diagnose, analyse, implement and suggest solution.	<ul style="list-style-type: none"> • Tests / Exams • Lab experimentation • Projects • Presentation • Studio work 	Answer scheme Rubric
Values	Ability to show a person's/team's principles or standards of behaviour.	<ul style="list-style-type: none"> • Presentation • Poster • Reflection paper 	Rubric
Entrepreneurial skill	Ability to develop a feasible business plan. Ability to apply knowledge, skills and critical	<ul style="list-style-type: none"> • Proposal of business plan • Conducting business project 	Rubric Checklist

Elements to be Assessed	Examples of Outcomes to be Measured	Examples of Assessment Tasks	Suggested Grading Instruments
	understanding of the theories, concepts, issues and challenges in conducting a business project.		

3.1.4 Weighting

The weighting of assessment tasks must be proportionate to the emphasis in teaching and the importance of the contents to the course. Tasks comprise continuous (assignments / quizzes / tests / midterm) and final assessments. The weighting must adhere to the stated assessment weighting for the course as approved by an academic committee.

3.1.5 Coverage

Assessment provides feedbacks on the extent that course LOs are achieved. As shown in Table 4, Lesson LOs are mapped to course LOs to ensure that each lesson LO contributes to the achievement of one or more of the course LOs. Consequently, content to be taught is determined based on the lesson LOs to be achieved. However, lesson LOs may differ from assessment outcomes because it is not possible to assess all contents taught due to constraints such as time. Thus, assessment may only cover a sample of the contents that are taught but academic staff must assure that the contents assessed represent the course content.

Mapping of course LOs and lesson LOs can be shown in a matrix to ensure links between these. The following example illustrates how the outcomes are assessed to ensure that all outcomes are assessed.

Table 4: Mapping of Lesson Learning Outcomes to Course Learning Outcomes

Course LOs (CLO)	Lesson LOs Contributing to the Course LOs
CLO 1	Lesson LOs 1, 4, 16
CLO 2	Lesson LOs 2, 7, 13
CLO 3	Lesson LOs 3, 5
CLO 4	Lesson LOs 1, 4
.....

3.1.6 Assessment Criteria

Assessment criteria for assessing assessment tasks should be made known, in writing and given together with the tasks. Assessment criteria guide the academic staff in assessing the assignment objectively, and the transparency of the criteria helps learners to be aware of course LOs. This practice also encourages students to self-assess, thus improving the quality of their work. Assessment criteria are defined as the specified standards against which participants' performance is measured. The mark that will be awarded for students' attainment of each criterion needs to be made clear. It can be communicated through various forms of rubric. (Appendix 9: Examples of Rubric)

3.2 Conducting both Formative and Summative Assessment

On-going formative assessments are conducted throughout a course, embedded and linked directly to the current learning and teaching activities. Through observations and interactions in the classroom, the assessment helps academic staff gain feedback on students' progress. In-class tasks can be given to assist students in monitoring and improving their learning. Providing feedback to students about their learning is crucial in understanding the use of the term *assessment for learning*. *Assessment for learning* is the process of seeking and interpreting evidence for use by the learners and academic staff to decide where the learners are in their learning and to indicate the next step to be taken to promote learning (Assessment Reform Group, 2002). With the increased use of coursework and continuous assessment, it offers the opportunity for constructive feedback to be given for their future learning. Formative assessment is *assessment for learning*.

On the other hand, summative assessments are being used to measure what students have learned at the end of a learning unit. Summative assessment refers to the assessment of student learning which involves assessing students' achievement by grading and certification and are used for institutional accountability and quality assurance purposes. The results then can be communicated to the students and parents. Summative assessment is *assessment of learning*.

Assessment as learning requires students to play an active role of becoming independent in their own learning and assessment (Earl, 2003). In order to incorporate *assessment as learning* in the learning process, academic staff should help students to develop skills for self-evaluation and metacognition and design instructions and assessments to monitor the student learning.

3.3 Types of Assessment

Selection of assessment tasks is made based on common practices in one's respective fields and experience. Choice of instruments must be determined based on the assessment criteria, in terms of the qualities and abilities that the academic staff seeks in the learner which are explicitly stated in the LOs statements. For example, in getting students to portray creativity and innovation, the assessor may require a studio project, development of product, performance or case studies which can appropriately measure the abilities of students in producing an output through experimentation, expression and exploration. Likewise, to assess cognitive domain and critical thinking skill, various selections of methods can be used including critique, review, report or tests.

Case studies and group project are able to determine students' abilities to apply theory into practice, apart from communication, managerial, critical thinking and problem solving skill. Case studies and group project may also be used to measure the affective domain in terms of values, attitude, professionalism and ethics. Measures of affective domain, such as personal values, can be assessed based on elements of style, personal identity and quality of inventiveness through presentation and final project. In assessing performance or demonstration techniques, one can adopt any or a combination of the following methods; demonstration, role play, poster, laboratory report, illustrated manual or simulation.

Multiple assessment methods should be adopted in measuring attainment of LOs, which include diverse elements to be measured.

3.3.1. Coursework Assessment

Although the list is not exhaustive, measurement of coursework can be done through the following but not limited to these methods: presentation, papers, critique, review, projects, case studies, portfolio, simulation, development of product, capstone project, reflective journals, exhibition, performance (e.g. music, theatre), clinical, poster, debates, lab reports, manuals and essays.

3.3.2. Examinations and Tests

Examinations and tests reflect cumulative attainment of LOs. Among others, the purpose of examinations and tests is to enhance students' abilities such as to articulate, argue, analyse, justify and communicate ideas and to critically assess. These abilities can be demonstrated through essays and structured open ended questions. Although objective questions are able to measure higher order thinking, they do not promote the other abilities that can be tapped in subjective questions. Among the tests that can be adapted in classroom assessment are as follows: written tests, oral tests, practical tests and standardised tests. Standardised tests can be purchased for the measurement of among others, communication skills or critical thinking skills.

Apart from formal assessment of learning, informal assessments such as pop quizzes and minute papers may provide formative feedback for students to gauge their achievement of LOs and to allow academic staff to improve or modify their teaching. Procedures that involve elements of self and peer assessment can also be implemented. Self-assessment is a valuable way of encouraging participants to evaluate and reflect on their own learning. Peer assessment is especially useful in determining attainment of skills such as leadership, team work and communication. The following table provides examples of methods of assessment.

3.3.3 Workplace Based Assessment

To ensure attainment of PLOs and to better prepare students for the workplace, training at the workplace allow students to immerse in real work environment thus allowing them to relate theory into practice. To evaluate their working ability, well planned assessments must be in place. Table 5 provides examples of possible tasks and the suggested grading instruments.

Table 5: Tasks and Grading Instruments for Workplace Based Assessment

Types of Workplace Based Immersion Programmes	Examples of Outcomes to be Measured	Examples of Assessment tasks	Suggested Grading Instruments
Practical training	Ability to solve problems in the workplace.	Solve a specific workplace problem and prepare a report.	Rubric – Assessor is to rate the student’s ability through: <ul style="list-style-type: none"> • Observations; • discussion with supervisor/peer workers; and • the effectiveness of the decision.
	Ability to communicate orally and in writing.	<ul style="list-style-type: none"> • Report • Presentation 	Rubric – Assessor is to rate the student’s ability through: <ul style="list-style-type: none"> • observations; • during meetings and discussion with supervisor/peer workers; and • based on the report and presentation made.
	Ability to plan and manage projects assigned.	<ul style="list-style-type: none"> • Proposal • Report • Presentation • Development of product (if applicable) 	

Types of Workplace Based Immersion Programmes	Examples of Outcomes to be Measured	Examples of Assessment tasks	Suggested Grading Instruments
Studio project	Ability to plan project assigned.	Proposal	Rubric
	Ability to explore and experiment on the project.	Drawing Portfolio	Rubric
	Ability to synthesise to the body of work.	<ul style="list-style-type: none"> • Final product • Journal • Presentation 	Rubric
	Ability to communicate the project work.	<ul style="list-style-type: none"> • Journal • Presentation 	Rubric
Clinical Training	Ability to solve clinical problems.	<ul style="list-style-type: none"> • Written test • Oral test 	Answer scheme
	Ability to show analytic skill.	<ul style="list-style-type: none"> • Objective structured clinical examination (OSCE) 	Answer scheme
	Ability to demonstrate critical thinking skills.	<ul style="list-style-type: none"> • Objective structured clinical examination (OSCE) • Long case examinations 	Answer scheme
	Ability to communicate effectively	<ul style="list-style-type: none"> • Objective structured clinical examination (OSCE) • Long case examinations • Mini CEX 	Answer scheme Rubric
	Demonstrate patient management skills	Portfolio	Rubric

3.4 Review of Assessment Methodologies and Currency with Development in Best Practices

Sources in determining currency and best practices of assessment include:

- i. external assessors of study programmes;
- ii. reports / analysis on achievement of LOs;
- iii. vetting committee at the department or faculty level;
- iv. students' feedback;
- v. employers' feedback; and
- vi. academic staff's feedback.

3.4.1 Validity and Reliability of Assessment

Validity and reliability are two important assessment principles, apart from flexibility and fairness. To ensure that the assessment can provide sufficient evidence of students' competence, it must be both valid and reliable. To ensure adherence to assessment principles, the HEP policy on assessment must be in place.

3.4.1.1 Validity of assessment

Validity refers to the ability of the assessment to measure what it is supposed to measure. Among the three types of validity; construct, content and criterion validity, the content validity may be the most important type of validity to ascertain in developing assessment tasks especially for examinations and tests. Content validity is based on the extent to which a measurement reflects the specific intended domain of content (Carmines & Zeller, 1991). In other words, the content validity shows the extent the measurement matches the learning outcomes. Since coverage of test items may just be a sample of contents covered in a course, the extent that the selected test items reflect the entire contents indicates the content validity. Content validity of assessment tasks are determined by the assessment vetting committee. The vetting committee should also judge the fairness in term of distribution of marks for each assessment task.

The validity issue in assessment will touch on two areas; relevancy and representative. 'Relevancy' is the extent to which the assessment is appropriate with the student's ability. 'Representative' meanwhile concerns whether the assessment can represent a group of students or body of opinions.

Some key factors to ascertain validity in an assessment are as follows:

- i. Assessment methods and instruments must be appropriate with the desired levels of learning outcomes to be attained.
- ii. Assessments given throughout the semester should be in various forms (such as tests, assignments, presentations) to assess the different learning domains and the CLOs

- determined for the course. More than one task and source of evidence are needed as a basis of judgment of students' competence.
- iii. Test coverage has to be balanced, covering most of the main ideas and important concepts in proportion to the emphasis they received in class.
 - iv. Assessment methods and instruments must be validated by another person with expertise in the area assessed.

3.4.1.2 Reliability of assessment

Reliability refers to the degree of consistency and accuracy of the assessment outcomes. It reflects the extent to which the assessment will provide similar outcomes for candidates with equal competence at different times or places, regardless of the assessor conducting the experiment (Department of Education and Training, 2008, pg. 10).

Thus, reliability includes consistency in assessment and grading. It reflects the extent the marking by an examiner is accurate, consistent, reliable, fair and acceptable. This could be easily established through conformity to the answer and marking schemes or rubrics. Academic staff are also recommended to provide sufficient and timely feedback on assessment tasks to allow students to improve their performance and progress. Complete and accurate information on assessment must be provided for students. Openness in assessment must be practised which require sharing of arrangements and requirements of the assessment process and the marking criteria with students at the early part of the semester.

Several approaches can be applied to increase reliability in assessment, which are illustrated below:

- i. For tests, provide clear directions on how to answer. Ambiguous questions and unclear directions must be avoided. For assignments or projects, provide students with specific guidelines on requirements and expectations, including information on how to ensure authenticity.
- ii. Develop marking scheme/rubric as guide to ensure standardization in marking. Vague scoring criteria threaten reliability.
- iii. Ensure fair distribution of marks for each question/task.

- iv. Provide clear guides for observing and recording evidences.
- v. Ensure conducive environment and fair administration of tests.
- vi. In cases of multiple examiners, conduct moderation in marking. The appointed moderators determine appropriateness of the standards and marking.
- vii. Develop tests of appropriate length. Very short tests are less reliable.

In order to maintain high validity and reliability of assessment, students undertaking a particular course in all sites must get the same opportunities in terms of contents, coverage, resources, and expertise of academic staff. Tests and examinations should be given and submitted/administered at the same time and under the same condition.

Feedback on appropriateness of assessment methods are made through reports and discussions at the department and faculty levels, based on review and recommendations made by stakeholders such as external assessors, academic staff, moderators, and students. Suggestions and conclusion arise from these meetings determine the improvement that need to be addressed in the assessment methods.

4.0 Management of Student Assessment

The HEP has significant responsibilities in regard to student assessment and the HEP's role as a qualifications-awarding body. That is the HEP's reputation is strongly implicated in the integrity of its assessment system. Thus, the HEP needs to develop and implement its own assessment processes and procedures, and these flow through the HEP's administrative processes. Figure 4 below provides an overview of structure, function and integration of the assessment processes and procedures at institutional level. At some institutions, assessment matters may be addressed as part of the curriculum review process. There may also be differences across institutions in the structures.

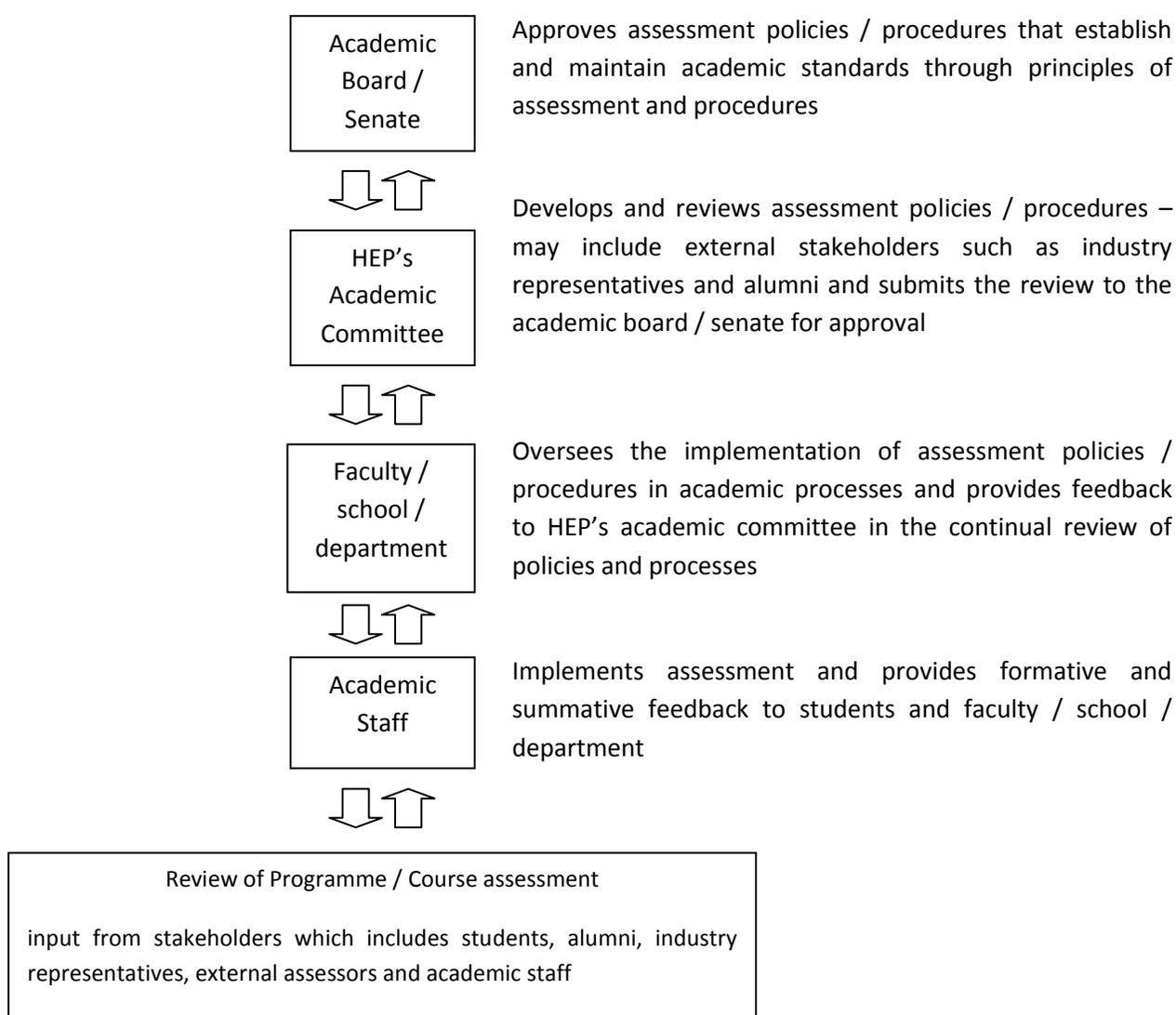


Figure 7: Assessment integration and process at institutional level

The HEP's system for the management of assessment involves issues of security, academic quality and review. Figure 8 outlines these procedures and their relationship.

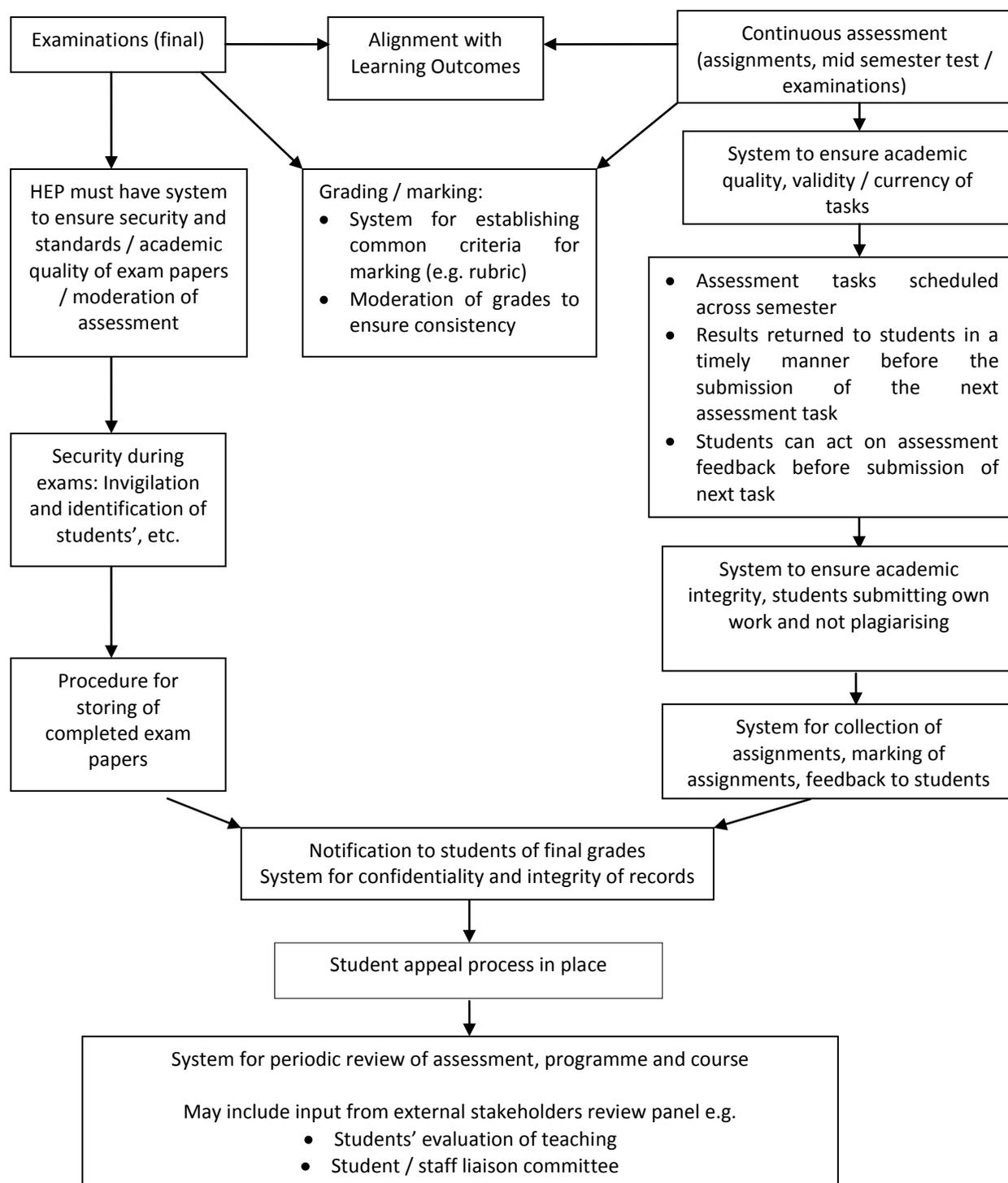


Figure 8: Assessment process

Figure 8 demonstrates the following points in diagramatic form:

- i. It is incumbent on HEPs to take a systematic approach to the assessment of the learning of their students. This is the basis for ensuring the integrity of their students' learning and the reputation of the HEP in terms of academic standards and graduate outcomes.
- ii. Students need to be informed of the assessment practices for the courses they are studying in a timely manner. Importantly, they need to receive feedback on their performance in the assessment, so that they can improve their performance in following assessment tasks, and in the course overall. For academic staff, assessment provides valuable information about their students and their learning, so that they can tailor or fine-tune the learning and teaching programme to address learning needs and strengths.
- iii. Academic staff require authority and established procedures for planning and monitoring the programme. This means that assessment can be designed along sound educational principles to elicit responses in line with the desired LOs.
- iv. The system also needs to be secured so that the assessment is valid and reliable, and maintains students' privacy and confidentiality. Processes must be in place to ensure this.
- v. The environment in which they study must value and encourage scholarly and creative achievements and be conducive to this.
- vi. Processes for students to appeal against the results of assessment must be in place and integrated in the system.
- vii. In line with the principles of quality assurance and improvement, the HEP's assessment system should undergo periodic review. This provides information that can be used for the assessment system to evolve and improve. This is because even well-designed systems must adapt to changing conditions and increased knowledge. On the basis of periodic, comprehensive review, decisions can be made about altering all or part of the assessment system, and the learning and teaching approaches. The views of external stakeholders and students on the learning and teaching programme and its assessment should also be integrated into the review and improvement. Importantly, this process of looking at the assessment system from a range of stakeholder perspectives provides the basis for it to be inclusive, responsive to external situations, issues and changes, and fair for all students who are undertaking the programme, regardless of their background and prior educational experiences. An assessment review usually is integrated with a review of the educational system as a whole.

viii. As has been outlined earlier in this document, the major value of an assessment system is its ability to enhance learning for all students. Reviews provide information that can be used to improve the system so that it continues to enhance learning in changing conditions. However, it needs to be noted that assessment reviews by the HEP are part of regular evaluations of the HEP's quality.

Reviews involve an inquiry process focused on two questions:

1. Does the system provide information useful for making decisions and taking action?
2. Are the actions taken educationally beneficial?

More specifically, reviewers consider how well the system adheres to each of the assessment principles. To ensure that timely and effective reviews are conducted, a continuing group needs to have responsibility for monitoring the review process. Students, other educators and experts also provide feedback about classroom and university practices.

Reviews of large-scale assessments and whole systems require broad participation from all stakeholder groups including academic staff and other educators, students and assessment and curriculum specialists. Independent expert analysis of the system is included in the public review process.

The most important criterion for assessment review is that assessment does not harm student learning and that it promotes active and engaged learning.

5.0 Summary

This GGP: AS, in discussing the key role of assessment in student learning, asserts the importance of assessment being well constructed and systematically implemented. The LOs, on which assessment is based, are derived from a number of sources: the HEP's vision and mission, the MOHE and MQF LO domains, and the LOs of the particular educational programme.

In practical form, this GGP: AS addresses the above points: the purposes of student assessment and methods for its implementation, and the participation and roles of the various sections of the HEP in the overall assessment system.

Given the significant role of assessment in student learning and the student experience, the GGP: AS has put forward the following:

- i. Relationship between Assessment and Learning
- ii. Assessment Method
- iii. Management of Student Assessment

Overall, the objective has been to assist HEPs and academic staff to enhance the learning and teaching experience, for the benefits of the students, the academic staff, the HEP overall and the future societies in which HEP graduates will participate.

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Glossary:

1.	Checklist	A list of dimensions of a performance or product that is simply checked present or absent.
2.	Criteria	A set of qualities used in judging a performance, a product or an assessment instrument.
3.	Criterion referenced standard	A description of an individual's performance in terms of the tasks he or she can and cannot perform.
4.	Norm referenced standard	A description of an individual's performance in terms of how it compares to the performance of others.
5.	Performance assessment	A procedure that requires individuals to perform tasks and the process or the product of the performance is judged using pre specified criteria.
6.	Portfolio assessment	A type of performance assessment. Assessment of collection of students' work and other data that represents students' accomplishment.
7.	Reliability	The degree to which assessment results are consistent from one measurement to another. Reliability typically indicate the consistency of scores or judgments over different forms, different time periods, different parts of the instrument or different raters. High reliability indicates greater freedom from error.
8.	Rubric	A set of scoring guidelines that describe the characteristics of the different levels of performance.
9.	Task	An assessment exercise that requires students to demonstrate a knowledge, skill or combination of attributes, by means of a performance or product.
10.	Validity	The extent to which inferences made from assessment results are appropriate, meaningful and useful in terms of the purpose for the assessment. Validity is a unitary concept that depends on a variety of types of evidence and is expressed by degree (low, high) and refers to the inferences drawn.

Abbreviation:

1.	CGPA	Cumulative Grade Point Average
2.	COPIA	Code of Practice for Institutional Audit
3.	COPPA	Code of Practice for Programme Accreditation
4.	OBE	Outcome Based Education
5.	PLO	Programme Learning Outcomes
6.	CLO	Course Learning Outcomes
7.	LO	Learning Outcomes
8.	CPD	Continuous Professional Development
9.	GGP	Guidelines to Good Practices
10.	HEP	Higher Education Provider
11.	MQA	Malaysian Qualifications Agency
12.	MQF	Malaysian Qualifications Framework

Appendix 1 : Levels in Bloom's Cognitive Domain

Bloom's taxonomy of learning objectives is used to define how well a skill or competency is learned or mastered. A fuller description of Bloom's taxonomy is given in the following pages but a brief summary of the activities associated with each level is given below.

1. At [Knowledge](#) Level of Learning a student can define terms
2. At [Comprehension](#) Level of Learning a student can work assigned problems and can example what they did
3. At [Application](#) Level of Learning a student recognizes what methods to used and then used the methods to solve problems
4. At [Analysis](#) Level of Learning a student can explain why the solution process works
5. At [Synthesis](#) Level of Learning a student can combine the part of a process in new and useful ways
6. At [Evaluation](#) Level of Learning a student can create a variety of ways to solve the problem and then, based on established criteria, select the solution method best suited for the problem.

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Appendix 2: Examples of Cognitive Processes and Action Verbs in Bloom’s Taxonomy

Bloom’s levels of thinking process begin by recognizing and recalling facts, concepts, theories, principles, procedures criteria and steps on self learning. The recognition and recalling process is essential towards performing more complex cognitive tasks especially in understanding events, abstraction, cause and effect of physical phenomenon and answering familiar textbook problems. The cognitive complexity increases as the tasks move from understanding to higher order thinking skills such as justifying an idea or action and generating new products or new ways of viewing things.

Elaboration of the six levels of thinking in Bloom’s taxonomy						
1 Remembering	2 Understanding	3 Applying	4 Analysing	5 Evaluating	6 Creating	
<i>Can the student RECALL information?</i>	<i>Can the student EXPLAIN ideas or concepts?</i>	<i>Can the student USE the new knowledge in another familiar situation?</i>	<i>Can the student DIFFERENTIATE between and RELATE constituent parts?</i>	<i>Can the student JUSTIFY an opinion, decision or course of action?</i>	<i>Can the student GENERATE new products, ideas or ways of viewing things?</i>	
<p>Recognising Locating knowledge in memory that is consistent with presented material. <u>Synonyms</u></p> <ul style="list-style-type: none"> Identifying Finding Selecting Indicating <p>Recalling Retrieving relevant knowledge from long-term memory. <u>Synonyms</u></p> <ul style="list-style-type: none"> Retrieving Naming Reproducing Recounting 	<p>Interpreting Changing from one form of representation to another <u>Synonyms:</u></p> <ul style="list-style-type: none"> Paraphrasing Translating Representing Clarifying Converting Rewriting Restating Expressing <p>Exemplifying Finding a specific example or illustration of a concept or principle</p>	<p>Summarising Drawing a logical conclusion from presented information. <u>Synonyms</u></p> <ul style="list-style-type: none"> Abstracting Generalising Outlining Précising <p>Inferring Abstracting a general theme or major point <u>Synonyms</u></p> <ul style="list-style-type: none"> Extrapolating Interpolating Predicting Concluding Extending 	<p>Executing Applying knowledge (often procedural) to a routine task. <u>Synonyms</u></p> <ul style="list-style-type: none"> Carrying out Measuring Constructing Demonstrating Computing Calculating Manipulating Operating Preparing Producing Drawing up Practising <p>Implementing</p>	<p>Differentiating Distinguishing relevant from irrelevant parts or important from unimportant parts of presented material. <u>Synonyms</u></p> <ul style="list-style-type: none"> Discriminating Selecting Focusing Distinguishing between Separating (Sub)dividing Examining Relating <p>Organising Determining how elements fit or function within a structure. <u>Synonyms</u></p>	<p>Checking Detecting inconsistencies or fallacies within a process or product. Determining whether a process or product has internal consistency. <u>Synonyms</u></p> <ul style="list-style-type: none"> Testing Detecting Monitoring Concluding Assessing Appraising Discriminating Determining <p>Critiquing Detecting the</p>	<p>Generating Coming up with alternatives or hypotheses based on criteria <u>Synonyms</u></p> <ul style="list-style-type: none"> Hypothesizing Proposing Developing Engendering Synthesising Providing options <p>Planning Devising a procedure for accomplishing some task. <u>Synonyms</u></p> <ul style="list-style-type: none"> Designing Formulating Combining Compiling

Elaboration of the six levels of thinking in Bloom's taxonomy						
1 Remembering <i>Can the student RECALL information?</i>	2 Understanding <i>Can the student EXPLAIN ideas or concepts?</i>	3 Applying <i>Can the student USE the new knowledge in another familiar situation?</i>	4 Analysing <i>Can the student DIFFERENTIATE between and RELATE constituent parts?</i>	5 Evaluating <i>Can the student JUSTIFY an opinion, decision or course of action?</i>	6 Creating <i>Can the student GENERATE new products, ideas or ways of viewing things?</i>	
	<p><u>Synonyms</u></p> <ul style="list-style-type: none"> Instantiating Illustrating... Representing Giving examples of Showing <p>Classifying Determining that something belongs to a category (e.g., concept or principle).</p> <p><u>Synonyms</u></p> <ul style="list-style-type: none"> Categorising Subsuming Organising 	<ul style="list-style-type: none"> Generalising <p>Comparing Detecting correspondences between two ideas, objects, etc</p> <p><u>Synonyms</u></p> <ul style="list-style-type: none"> Contrasting Matching Mapping <p>Explaining Constructing a cause-and-effect model of a system.</p> <p><u>Synonyms</u></p> <ul style="list-style-type: none"> Elucidating Constructing models 	<p>Applying knowledge (often procedural) to a non-routine task.</p> <p><u>Synonyms</u></p> <ul style="list-style-type: none"> Using Estimating Predicting Solving Changing Discovering Explaining how Verifying Finding 	<ul style="list-style-type: none"> Outlining Structuring Integrating (Re)arranging Categorising Ordering Deriving <p>Attributing Determining the point of view, bias, values, or intent underlying presented material.</p> <p><u>Synonyms</u></p> <ul style="list-style-type: none"> Deconstructing Comparing Contrasting Diagnosing 	<p>appropriateness of a procedure for a given task or problem.</p> <p><u>Synonyms</u></p> <ul style="list-style-type: none"> Judging Questioning Justifying Defending Discussing Criticising Arguing Including Rating Ranking Valuing 	<ul style="list-style-type: none"> Devising Revising Putting together Suggesting <p>Producing Inventing a product</p> <p><u>Synonyms</u></p> <ul style="list-style-type: none"> (Re)constructing Composing Modifying Altering Building Enlarging

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Appendix 3: Two-Dimensional Bloom’s Revised Cognitive Domain

This two-dimensional cognitive domain allows you to specify the learning complexities (depth or competency) in the four knowledge dimensions. The cells can be used to indicate the learning outcomes and hence the assessment targeted for each course.

Cognitive Process Dimension: From Lower Order (1 & 2) to Higher Order (3-6) Thinking Skills							
	<p>This revised Bloom’s Taxonomy will assist you as you work to improve instruction to ensure that</p> <ul style="list-style-type: none"> Standards, lessons, and assessments are aligned. Lessons are cognitively rich. Instructional opportunities are not missed. 	<p>1. Remember: retrieving relevant knowledge from long term memory</p> <ol style="list-style-type: none"> Recognizing Recalling 	<p>2. Understand: determining the meaning of instructional messages</p> <ol style="list-style-type: none"> Interpreting Exemplifying Classifying Summarizing Inferring Comparing Explaining 	<p>3. Apply: carrying out or using a procedure in a given situation</p> <ol style="list-style-type: none"> Executing Implementing 	<p>4. Analyze: breaking material into its constituent parts and detecting how the parts relate to one another and to an overall structure or purpose</p> <ol style="list-style-type: none"> Differentiating Organizing Attributing 	<p>5. Evaluate: making judgments based on criteria and standards</p> <ol style="list-style-type: none"> Checking Critiquing 	<p>6. Create: putting elements together to form a novel, coherent whole or make an original product</p> <ol style="list-style-type: none"> Generating Planning Producing
Knowledge Dimension	<p>A. Factual Knowledge: basic elements that students must know to be acquainted with a discipline or solve a problem in it.</p> <ol style="list-style-type: none"> Knowledge of terminology Knowledge of specific details and elements 						
	<p>B. Conceptual knowledge: the interrelationships among the basic elements within a larger structure that enable them to function together</p> <ol style="list-style-type: none"> Knowledge of classification Knowledge of principles and generalizations Knowledge of theories, models and structures 						

Cognitive Process Dimension: From Lower Order (1 & 2) to Higher Order (3-6) Thinking Skills							
	<p>This revised Bloom's Taxonomy will assist you as you work to improve instruction to ensure that</p> <ul style="list-style-type: none"> Standards, lessons, and assessments are aligned. Lessons are cognitively rich. Instructional opportunities are not missed. 	<p>1. Remember:</p> <p>retrieving relevant knowledge from long term memory</p> <p>3. Recognizing 4. Recalling</p>	<p>2. Understand:</p> <p>determining the meaning of instructional messages</p> <p>8. Interpreting 9. Exemplifying 10. Classifying 11. Summarizing 12. Inferring 13. Comparing 14. Explaining</p>	<p>3. Apply:</p> <p>carrying out or using a procedure in a given situation</p> <p>3. Executing 4. Implementing</p>	<p>4. Analyze:</p> <p>breaking material into its constituent parts and detecting how the parts relate to one another and to an overall structure or purpose</p> <p>4. Differentiating 5. Organizing 6. Attributing</p>	<p>5. Evaluate:</p> <p>making judgments based on criteria and standards</p> <p>3. Checking 4. Critiquing</p>	<p>6. Create:</p> <p>putting elements together to form a novel, coherent whole or make an original product</p> <p>4. Generating 5. Planning 6. Producing</p>
Knowledge Dimension	<p>C. Procedural knowledge: How to do something: methods of inquiry, and criteria for using skills, algorithms, techniques and methods</p> <p>a. Knowledge of subject specific skills and algorithms b. Knowledge of techniques and methods c. Knowledge of criteria for determining when to use appropriate procedures</p>						
	<p>D. Metacognitive knowledge: knowledge of cognition in general as well as awareness of one's own cognition</p> <p>a. Strategic knowledge b. Cognitive tasks, including appropriate contextual and conditional knowledge c. Self-knowledge</p>						

*SC SDE (Pat Mohr). Adapted from Lorin W. Anderson, David R. Krathwohl et al (Eds.) *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives* © 2001; published by Allyn and Bacon, Boston, MA © 2001 by Pearson Education; reprinted by permission of the publisher

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Appendix 4: Psychomotor Domain – Simpson’s Model

The psychomotor domain (Simpson, 1972) includes physical movement, coordination, and use of the motor-skill areas. Development of these skills requires practice and is measured in terms of speed, precision, distance, procedures, or techniques in execution. The seven major categories are listed from the simplest behavior to the most complex. The MQA and MOHE LO domains belonging to the psychomotor taxonomy include practical skills and entrepreneurship.

Level	Category or 'level'	Description	Examples of activity or demonstration and evidence to be measured	Action verbs which describe the activity to be trained or measured at each level)
1	Perception	Awareness, the ability to use sensory cues to guide physical activity. The ability to use sensory cues to guide motor activity. This ranges from sensory stimulation, through cue selection, to translation.	Use and/or selection of senses to absorb data for guiding movement Examples: Detects non-verbal communication cues. Estimate where a ball will land after it is thrown and then moving to the correct location to catch the ball. Adjusts heat of stove to correct temperature by smell and taste of food. Adjusts the height of the forks on a forklift by comparing where the forks are in relation to the pallet. "By the end of the music theatre program, students will be able to relate types of music to particular dance steps."	chooses, describes, detects, differentiates, distinguishes, feels, hears, identifies, isolates, notices, recognizes, relates, selects, separates, touches,
2	Set	Readiness, a learner's readiness to act. Readiness to act. It includes mental, physical, and emotional sets. These three sets are dispositions that predetermine a person’s response to different situations (sometimes called mindsets).	Mental, physical or emotional preparation before experience or task Examples: Knows and acts upon a sequence of steps in a manufacturing process. Recognize one’s abilities and limitations. Shows desire to learn a new process (motivation). NOTE: This subdivision of Psychomotor is closely related with the "Responding to phenomena" subdivision of the Affective domain.	arranges, begins, displays, explains, gets set, moves, prepares, proceeds, reacts, shows, states, volunteers, responds, starts,

Level	Category or 'level'	Description	Examples of activity or demonstration and evidence to be measured	Action verbs which describe the activity to be trained or measured at each level)
			“By the end of the physical education program, students will be able to demonstrate the proper stance for batting a ball.”	
3	Guided Response	Attempt. The early stages in learning a complex skill that includes imitation and trial and error. Adequacy of performance is achieved by practicing.	<p>Imitate or follow instruction, trial and error.</p> <p>Examples: Performs a mathematical equation as demonstrated. Follows instructions to build a model. Responds hand-signals of instructor while learning to operate a forklift.</p> <p>“By the end of the physical education program, students will be able to perform a golf swing as demonstrated by the instructor.”</p>	assembles, builds, calibrates, constructs, copies, dismantles, displays, dissects, fastens, fixes, follows, grinds, heats, imitates, manipulates, measures, mends, mixes, reacts, reproduces, responds sketches, traces, tries.
4	Mechanism	<p>basic proficiency, the ability to perform a complex motor skill.</p> <p>This is the intermediate stage in learning a complex skill. Learned responses have become habitual and the movements can be performed with some confidence and proficiency.</p>	<p>competently respond to stimulus for action</p> <p>Examples: Use a personal computer. Repair a leaking faucet. Drive a car.</p> <p>“By the end of the biology program, students will be able to assemble laboratory equipment appropriate for experiments.”</p>	assembles, builds, calibrates, completes, constructs, dismantles, displays, fastens, fixes, grinds, heats, makes, manipulates, measures, mends, mixes, organizes, performs, shapes, sketches.
5	Complex Overt Response	<p>expert proficiency, the intermediate stage of learning a complex skill.</p> <p>The skillful performance of motor acts that involve complex movement patterns.</p> <p>Proficiency is indicated by a quick, accurate, and highly coordinated performance, requiring a minimum of energy. This category includes performing without hesitation, and automatic</p>	<p>Execute a complex process with expertise</p> <p>Examples: Maneuvers a car into a tight parallel parking spot. Operates a computer quickly and accurately. Displays competence while playing the piano.</p> <p>“By the end of the industrial education program,</p>	assembles, builds, calibrates, constructs, coordinates, demonstrates, dismantles, displays, dissects, fastens, fixes, grinds, heats, manipulates, measures, mends, mixes, organizes, sketches.

Level	Category or 'level'	Description	Examples of activity or demonstration and evidence to be measured	Action verbs which describe the activity to be trained or measured at each level)
		performance. For example, players are often utter sounds of satisfaction or expletives as soon as they hit a tennis ball or throw a football, because they can tell by the feel of the act what the result will produce.	students will be able to demonstrate proper use of woodworking tools to high school students.”	NOTE: The key words are the same as Mechanism, but will have adverbs or adjectives that indicate that the performance is quicker, better, more accurate, etc.
6	Adaptation	<p>adaptable proficiency, a learner's ability to modify motor skills to fit a new situation.</p> <p>Skills are well developed and the individual can modify movement patterns to fit special requirements.</p>	<p>Alter response to reliably meet varying challenges</p> <p>Examples: Responds effectively to unexpected experiences. Modifies instruction to meet the needs of the learners. Perform a task with a machine that it was not originally intended to do (machine is not damaged and there is no danger in performing the new task).</p> <p>“By the end of the industrial education program, students will be able to adapt their lessons on woodworking skills for disabled students.”</p>	<p>adapts, adjusts, alters, changes, integrates, rearranges, reorganizes, revises, solves, varies.</p>
7	Origination	<p>creative proficiency, a learner's ability to create new movement patterns.</p> <p>Creating new movement patterns to fit a particular situation or specific problem. Learning outcomes emphasize creativity based upon highly developed skills.</p>	<p>Develop and execute new integrated responses and activities</p> <p>Examples: Constructs a new theory. Develops a new and comprehensive training programming. Creates a new gymnastic routine.</p>	<p>arranges, builds, combines, composes, constructs, creates, designs, formulates, initiate, makes, modifies, originates, re-designs, trouble-shoots.</p>

Appendix 5: Affective Domain- Krathwohl

The Affective Domain addresses interests, attitudes, opinions, appreciations, values, and emotional sets. This domain includes the manner in which we deal with things emotionally, such as feelings, values, appreciation, enthusiasms, motivations, and attitudes. The MQA and MOHE LO domains belonging to the affective taxonomy include communication, teamwork and social responsibilities, ethics, morality, professionalism, lifelong learning, management and leadership.

Level	Category	Description	Examples	Action Verbs
1	Receiving	The student passively attends to particular phenomena or stimuli [classroom activities, textbook, music, etc.] The teacher's concern is that the student's attention is focused. Intended outcomes include the pupil's awareness that a thing exists. Emphasis is on awareness, willingness to hear, selected attention.	Listens attentively, shows sensitivity to social problems. Listens to others with respect. Listens for and remembers the name of newly "By the end of the lesson, students will listen attentively to ideas from their team members."	Attends, accepts, asks, chooses, describes, follows, gives, holds, identifies, listens, locates, names, points to, selects, selectively attends to, replies, uses.
2	Responding	The student actively participates. The pupil not only attends to the stimulus but reacts in some way. Emphasis is on active participation on the part of the learners. Learning outcomes may emphasize compliance in responding, willingness to respond, or satisfaction in responding (motivation).	Completes homework, obeys rules, participates in class discussion, shows interest in subject, enjoys helping others. Gives a presentation. Questions new ideals, concepts, models, in order to fully understand them. Knows safety rules and practices them. "By the end of the lesson, students will be able to perform a quick check on their team participation performance.."	Acclaims, aids, answers, applauds, approves, assists, complies, conforms, discusses, greets, helps, labels, performs, practices, presents, reads, recites, reports, selects, tells, writes, Volunteers.

Level	Category	Description	Examples	Action Verbs
3	Valuing	<p>The worth a student attaches to a particular object, phenomenon, or behavior. Ranges from acceptance to commitment (e.g., assumes responsibility for the functioning of a group). Attitudes and appreciation.</p> <p>Valuing is based on the internalization of a set of specified values, while clues to these values are expressed in the learner's overt behavior and are often identifiable.</p>	<p>Demonstrates belief in democratic processes, appreciates the role of science in daily life, shows concern for others' welfare, demonstrates a problem-solving approach.</p> <p>Is sensitive towards individual and cultural differences (value diversity). Shows the ability to solve problems. Proposes a plan to bring about social improvement and follows through with commitment. Informs management on strongly felt matters.</p> <p>"By the end of the program, students will be able to demonstrate the scientific approach when resolving physical issues.</p>	<p>Assists, completes, debates, demonstrates, denies, differentiates, explains, follows, forms, increases proficiency in, initiates, invites, joins, justifies, proposes, protests, reads, relinquishes, reports, selects, shares, studies, supports, works.</p>
4	Organization	<p>Brings together different values, resolving conflicts among them, and starting to build an internally consistent value system--comparing, relating and synthesizing values and developing a philosophy of life.</p> <p>Organizes values into priorities by contrasting different systems. The emphasis is on comparing, relating, and synthesizing values.</p>	<p>Recognizes the need for balance between freedom and responsible behavior, understands the role of systematic planning in solving problems; accepts responsibility for own behavior.</p> <p>Explains the role of systematic planning in solving problems. Accepts professional ethical</p>	<p>Accommodates, adheres, alters, arranges, balances, combines, compares, completes, defends, explains, formulates, generalizes, identifies, integrates, modifies, orders, organizes, prepares, relates, synthesizes.</p>

Level	Category	Description	Examples	Action Verbs
			<p>standards. Creates a life plan in harmony with abilities, interests, and beliefs. Prioritizes time effectively to meet the needs of the organization, family, and self.</p> <p>“By the end of the environmental studies program, students will be able to organize the conservation efforts of urban, suburban and rural communities.”</p>	
5	Internalizing values: Characterization by a Value or Value Complex	At this level, the person has held a value system for a sufficiently long time to control his/her behavior, has developed a characteristic "life style." Behavior is pervasive, consistent, predictable, and most importantly, characteristic of the learner. Instructional objectives are concerned with the student's general patterns of adjustment (personal, social, emotional).	<p>Concerned with personal, social, and emotional adjustment: displays self reliance in working independently, cooperates in group activities (displays teamwork), maintains good health habits.</p> <p>Uses an objective approach in problem solving. Displays a professional commitment to ethical practice on a daily basis. Revises judgments and changes behavior in light of new evidence. Values people for what they are, not how they appear.</p>	Acts, discriminates, displays, influences, interprets, listens, maintains objectivity modifies, performs, practices, proposes, qualifies, questions, respects, revises, serves, solves, uses evidence, verifies.

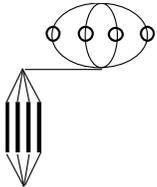
Level	Category	Description	Examples	Action Verbs
			<p>“By the end of the counseling program, students will be able to objectively interpret evidence presented by clients during a therapy session.”</p>	

<http://www.humboldt.edu/~tha1/bloomtax.html> & <http://academic.udayton.edu/health/syllabi/health/lesson01b.htm>. Accessed June 2009 Adopted from: Benjamin S. Bloom, Bertram

B. Mesia, and David R. Krathwohl (1964). Taxonomy of Educational Objectives (two vols: The Affective Domain & The Cognitive Domain). New York. David McKay

Appendix 6: SOLO Taxonomy as a Reflection of Levels of Student Performance

Structure of Observed Learning Outcome (SOLO) taxonomy is a taxonomy that indicates complexity of the cognitive learning. It is especially beneficial when setting cognitive tasks or assessment items and designing rubrics (the performance standards) for grading the task. When using this taxonomy for writing learning outcomes and grading, it informs learners and faculty staff on the criteria and the standards of answers required to show evidence of attainment at the various competency or levels of cognitive performance.

SOLO category	Representation	Type of outcome	Solution to problem	Structure of essay
Unanticipated extension (Extended Abstract)		Create Synthesise Hypothesise Validate Predict Debate Theorise	Solution to problem which goes beyond anticipated answer. Project or practical report dealing with real world ill-defined topic.	Well structured essay with clear introduction and conclusion. Issues clearly identified; clear framework for organizing discussion; appropriate material selected. Evidence of wide reading from many sources. Clear evidence of sophisticated analysis or innovative thinking.
Logically related answer		Apply Outline Distinguish Analyse Classify Contrast Summarise Categorise	Elegant solution to complex problem requiring identification of variables to be evaluated or hypotheses to be tested. Well structured project or practical report on open task.	Essay well structured with a clear introduction and conclusion. Framework exists which is well developed. Appropriate material. Content has logical flow, with ideas clearly expressed. Clearly identifiable structure to the argument with discussion of differing views.

SOLO category	Representation	Type of outcome	Solution to problem	Structure of essay
Intermediate			<p>Solution to multiple part problem with most parts correctly solved but some errors.</p> <p>Reasonably well structured project or practical report on open task.</p>	<p>Essay fairly well structured. Some issues identified. Attempt at a limited framework. Most of the material selected is appropriate. Introduction and conclusion exists. Logical presentation attempted and successful in a limited way. Some structure to the argument but only limited number of differing views and no new ideas.</p>
Multiple unrelated points		<p>Explain</p> <p>Define</p> <p>List</p> <p>Solve</p> <p>Describe</p> <p>Interpret</p>	<p>Correct solution to multiple part problem requiring substitution of data from one part to the next.</p> <p>Poorly structured project report or practical report on open task.</p>	<p>Essay poorly structured. A range of material has been selected and most of the material selected is appropriate. Weak introduction and conclusion. Little attempt to provide a clear logical structure. Focus on a large number of facts with little attempt at conceptual explanations. Very little linking of material between sections in the essay or report.</p>
Single point		<p>State</p> <p>Recognise</p> <p>Recall</p> <p>Quote</p> <p>Note</p> <p>Name</p>	<p>Correct answer to simple algorithmic problem requiring substitution of data into formula.</p> <p>Correct solution of one part of more complex problem.</p>	<p>Poor essay structure. One issue identified and this becomes the sole focus; no framework for organizing discussion. Dogmatic presentation of a single solution to the set task. This idea may be restated in different ways. Little support from the literature.</p>

SOLO category	Representation	Type of outcome	Solution to problem	Structure of essay
Misses the point			Completely incorrect solution.	Inappropriate or few issues identified. No framework for discussion and little relevant material selected. Poor structure to the essay. Irrelevant detail and some misinterpretation of the question. Little logical relationship to the topic and poor use of examples.

SOLO Taxonomy (Biggs 2003). From: http://naticluster.wikispaces.com/file/view/The_SOLO_taxonomy_as_a_guide_to_setting_and_marking_assessment.doc. Accessed April 2010.

Appendix 7: Example of a Systematic Approach to Directly and Indirectly Assessing Programme Learning Outcomes

Outcome Indicators (OI) are assessment tools used to collect evidence of students' performance and attainment. The program learning outcomes (PLO) are statements of what students know and be able to do upon completion of the program and derived from the nine (9) MOHE LO domains or the eight (8) MQF LO domains. Direct evidences of knowing and abilities are assessed through quantitative and qualitative methods. Indirect evidences deal with perceptions of students on their learning experiences rather than the actual knowing and abilities. Since a few methods are required to validate inference of PLO attainment, data is collected by using more than two (2) direct evidences and data for at least one (1) indirect evidence.

PLOs Outcome Indicators/Assessment Methods		PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
OI1	Entrance Survey (such as MOHE's My3S)					✓	✓	✓			✓
OI2	Entrance Exam (such as standardized Tests)	✓									
OI3	Exit Exam (such as CLA, standardized Tests)	✓									
OI4	Exit Interview	✓	✓		✓	✓					
OI5	Exit Survey (such as MOHE's My3S and NSSE)					✓	✓	✓			✓
OI6	Course-Embedded Assessment	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
OI7	Capstone Course/Project		✓	✓	✓			✓	✓	✓	
OI8	Final Oral Presentation (Live or Videotape)	✓			✓	✓					
OI9	Portfolio		✓	✓	✓						
OI10	Peer & Self Evaluations				✓		✓				✓

Appendix 8: Example of a Systematic Approach to Assessing Programme Educational Objectives

Collecting evidences for the attainment of program educational objectives are done by using indirect outcome indicators (assessment tools). It is best to use at least two assessment tools in order to validate inferences obtained from the data collected. Indicated below is an example of outcome indicators used to collect evidences.

PEOs Indicators/Assessment Methods		PEO1	PEO2	PEO3	PEO4
OI1	Employer Survey		✓	✓	✓
OI2	Alumni Survey		✓	✓	✓
OI3	Alumni Interviews	✓			
OI4	Stakeholder Survey			✓	
OI5	Job Offers	✓			
OI6	Starting Salaries		✓		
OI7	Admission to Graduate Programs	✓			
	Admission to professional qualification				

Appendix 9: Examples of Rubrics to Assess Different Outcomes

Rubrics may be used to measure several different skills or a specific performance. The following rubric may be used to measure students' ability to gather relevant information which is part of the MQA's outcomes on information management and lifelong learning skills. Criterion being assessed is the appropriateness of literature cited.

Example 1: Rubric to Assess a Component of Information Management and Lifelong Learning Skills

Standard	Mark (Max 20)	Required Performance
Very poor	0 - 1	No literature cited.
Poor	2 - 4	Some literature cited, only some references to argument.
Marginal	5 - 6	Literature cited is appropriate, no citations at some crucial points.
Adequate	7 - 8	Literature cited is appropriate and covers all crucial points; however, it is limited to references supplied by the teaching staff.
Good	9 - 10	Literature cited is appropriate and covers all crucial points, includes some references found by the students independent of the teaching staff.

Source: <http://www.tedi.uq.edu.au/downloads/Criteria.pdf>

The following rubric is an example of assessment guideline for a research proposal. It can be used as an indication of attainment of writing skills and critical thinking skills.

Example 2: Rubric to Assess Research Proposal

Criteria for Evaluation	Incompetent-----Highly competent					
INTRODUCTION						
1. Identifies research problems and key issues.		1	2	3	4	5
2. Appropriateness of objectives/purpose given the purpose, design and methods of study.		1	2	3	4	5
3. Appropriateness of research problems/hypotheses.		1	2	3	4	5
4. Clarity of operational definitions for all variables studied.		1	2	3	4	5
LITERATURE REVIEW						
5. Provides comprehensive analysis of literature.	0	1	2	3	4	5
6. Demonstrates ability to critically evaluate past literature.	0	1	2	3	4	5
7. Shows ability in presenting literature review and forming themes.	0	1	2	3	4	5
8. Provides a strong theoretical framework of study.	0	1	2	3	4	5
METHODOLOGY						
9. Appropriateness of research design.	0	1	2	3	4	5
10. Appropriateness of target population and selection of samples.	0	1	2	3	4	5
11. Appropriateness of sample size and sampling procedure for the research questions and methodology.	0	1	2	3	4	5
12. Appropriateness of instruments/methods for gathering data.	0	1	2	3	4	5
13. Validity of instruments.	0	1	2	3	4	5

14. Reliability of instruments.	0	1	2	3	4	5
15. Appropriateness of data gathering procedures.	0	1	2	3	4	5
16. Appropriateness of data analysis.	0	1	2	3	4	5
OVERALL						
17. Utilizes appropriate language and grammar.	0	1	2	3	4	5
18. Citation structure and format follow acceptable protocols.	0	1	2	3	4	5
19. Viability of study.	0	1	2	3	4	5
20. Coherence of purpose, questions, interventions, data gathering methods, and data analysis methods.	0	1	2	3	4	5
TOTAL MARKS						

The following rubric, in the form of mark band may be used to measure attainment of entrepreneurial skill. A description on performance expected for a range of scores is usually provided.

Example 3: Example of Entrepreneurial Skill

Mark Band	Criteria	Range of scores
Mark Band 1	<ul style="list-style-type: none"> • Very little, if any, successful attempt to analyse or evaluate information before making decisions. • Limited ability to apply the skills of enterprise to the identification of a suitable project or activity. • No variety in the methods of communication employed, or the • communication was not suitable for the intended audience. • Some knowledge of enterprise concepts and terminology 	1-4
Mark Band 2	<ul style="list-style-type: none"> • Some attempt to analyse information before making decisions. • Reasonable ability to apply the skills of enterprise to the identification of a suitable project or activity. • A variety of communication methods employed, but not completely suitable for the audience 	5-7
Mark Band 3	<ul style="list-style-type: none"> • Ability to analyse information and evaluate courses of action before making decisions. • Good ability to apply the skills of enterprise to the identification of a suitable project or activity. • A variety of communication methods employed, fully suitable for the audience. 	8-10

Mark Band 1 : 1 to 4 marks

Work at this level is likely to be incomplete. The candidate may present only one of the two required pieces or two partially completed pieces of work. The work presented may be written notes rather than the formats requested. To gain marks in this task, however, there must be some use of relevant business concepts and terminology.

To achieve 4 marks candidates must show some evidence of identification of a suitable project. Therefore candidates who present only the wall chart are unlikely to gain higher than 3 marks as they will not be demonstrating this aspect.

Mark Band 2 : 5 to 7 marks

Work at this level will provide evidence that both required tasks have been attempted. The wall chart/information leaflet and report will not be entirely suitable for the audience – there may be errors in layout, spelling or language used. There will be evidence to show how the problem or need was identified and evidence of some attempt to evaluate their own entrepreneurial skills.

Mark Band 3 : 8 to 10 marks

To achieve Mark Band 3, candidates must produce evidence for both of the required tasks. In the report they will consider both the advantages and disadvantages of each project before making a decision. Candidates at this level will have used relevant terminology from the syllabus in their evidence and will have presented their materials using the required layouts. The language and layouts chosen will be suitable for the chosen audiences.

Source: http://www.cie.org.uk/docs/qualifications/new_qualifications/enterprise/0454%20Enterprise%20Teacher%20Guide.pdf