Agensi Kelayakan Malaysia
Malaysian Qualifications Agency

GUIDELINES TO GOOD PRACTICES: PROGRAMME DEVELOPMENT AND DELIVERY

2023
EDITION

Guidelines to Good Practices: Programme Design and Delivery
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FOREWORD

The Malaysian Qualifications Agency (MQA) has published numerous quality assurance documents, such as the Malaysian Qualifications Framework (MQF), Code of Practice for Programme Accreditation (COPPA), Code of Practice for Institutional Audit (COPIA), Code of Practice for TVET Programme Accreditation (COPTPA), Code of Practice for Programme Accreditation: Open and Distance Learning (COPPA: ODL), Standards, Programme Standards (PSs) and Guidelines to Good Practices (GGP), to ensure that the programmes offered by the Higher Education Providers (HEPs) in Malaysia meet international practices. It is imperative that these documents be read together with this GGP in programme development and delivery.

This GGP outlines sets of characteristics that describe the minimum levels of acceptable practices based on the four quality assurance areas: Section 1: Introduction; Section 2: Statement of Educational Objectives of Academic Programmes and Learning Outcomes; Section 3: Programme Development: Process, Content, Structure and Teaching-Learning Methods; and Section 4: Programme Delivery.

Accordingly, the GGP covers different levels of standards leading to the award of individual qualifications prescribed in the MQF Second Edition, ranging from the level of Certificate (Level 3, MQF) to the level of Doctoral Degree (Level 8, MQF).

This GGP encourages diversity and allows programme providers to be innovative in creating their niches. HEPs should ensure that they produce graduates that meet the current and future needs of the industry and at the same time, fulfil their obligations to society. Among others, this document includes approaches to programme development and delivery in various contexts, which are intended to give clarity and not be adopted verbatim.

MQA developed this GGP in collaboration with the Ministry of Higher Education. It represents the significant contribution of the panel members from both public and private HEPs, and in consultation with various HEPs, relevant government and statutory agencies, industries, alumni and students through stakeholder workshops and online feedback. The GGP developed reflects national and international best practices to ensure programme development from the HEPs in Malaysia is on par with those in other countries.

MQA would like to express its heartfelt appreciation to all the panel members and all stakeholders for their valuable inputs and to MQA officers who have contributed to developing the GGP for Programme Development and Delivery. It is hoped that this GGP will benefit stakeholders in developing and delivering the programme for our future students to fulfil the current industry demand.

Dato' Prof. Dr. Mohammad Shatar Sabran (DIMP, DPMP)
Chief Executive Officer
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ABBREVIATIONS

BoK	Body of Knowledge
CLO	Course Learning Outcome
COPIA	Code of Practice for Institutional Audit
COPPA	Code of Practice for Programme Accreditation
COPPA:ODL	Code of Practice for Programme Accreditation: Open and Distance Learning
COPTPA	Code of Practice for TVET Programme Accreditation
CPD	Continuing Professional Development
CQI	Continual Quality Improvement
ELT	Effective Learning Time
EXCEL	Experiential Learning and Competency-Based Education Landscape
JKPT	*Jawatankuasa Pendidikan Tinggi*
JPT	*Jabatan Pendidikan Tinggi* (Department of Higher Education)
GGP	Guidelines to Good Practices
HEP	Higher Education Provider
HEIPs	High Impact Educational Practices
LMS	Learning Management System
LOC	Learning Outcome Cluster
LOD	Learning Outcome Domain
MASCO	Malaysia Standard Classification of Occupations
MOHE	Ministry of Higher Education
MOOC	Massive Open Online Courses
MPU	Matapelajaran Pengajian Umum
MQA	Malaysian Qualifications Agency
MQF	Malaysian Qualifications Framework
ODL	Open and Distance Learning
PDD	Programme Design and Delivery
PEO	Programme Educational Objective
PLO	Programme Learning Outcomes
PS	Programme Standards
QA	Quality Assurance
SBL	Substitute Blended Learning
SIM	Self-instructional Material
SLT	Student Learning Time
SMDD	Standards: Master's and Doctoral Degree

SOLO	Structure of Observed Learning Outcomes
SOP	Standard Operating Procedure
TVET	Technical and Vocational Education and Training
WBL	Work-based Learning

Section 1

Introduction

1. The Guidelines to Good Practices: Programme Design and Delivery (GGP: PDD) is a document developed to assist Higher Education Providers (HEP) to meet the standards of Programme Design and Delivery, which is Area 1 as stated in the Code of Practice for Programme Accreditation (COPPA), second edition issued in 2017 [also known as COPPA, Second Edition (2017)]. The document is part of a series of similar guidelines covering other areas in the COPPA, as well as specific themes under quality assurance of higher education. The GGPs are developed and written to guide and assist HEPs implement the standards and practices in order to conform with the listed COPPA standards. The GGP presents some good practices in which the HEP can improvise, innovate or customise further to suit its internal context, or propose its own practise which also addresses the specified standards and requirements.

2. COPPA, Second Edition (2017) is a revision of the earlier version of COPPA issued in 2008. It has seven areas of evaluation and each of them contains several sub-areas, within which the standards for programme accreditation are formulated and clustered. Area 1 of COPPA, second edition (2017) is one of the seven areas that are connected to other areas through these standards as some standards must be read or evaluated with consideration of other related standards in different areas, such as Area 2 on Assessment of Student Learning.

3. In addition, the COPPA standards should also be read with the Malaysian Qualifications Framework (MQF) Second Edition, other standard documents, such as the Code of Practice for Institutional Audit (COPIA), the Guide on Compliance Evaluation for Self-Accreditation Universities, the Standards: Master's and Doctoral Degree and the Programme Standards (PS), as well as guidelines of good practices.

4. In general, as the standards outline the principles upon which an academic programme needs to be developed, delivered and managed, COPPA, second edition (2017) covers a diversity of programmes. For programmes under specific themes, namely "open and distance learning" (ODL) programmes and "technical and vocational education and training" (TVET) programmes, the respective codes of practice are developed to take into account specific requirements for these programmes. Hence, the Code of Practice for Programme Accreditation: Open and Distance Learning (COPPA:ODL) and the Code of Practice for TVET Programme Accreditation (COPTPA) were issued for accreditation of the ODL and TVET programmes, respectively, in 2019. As both COPPA:ODL and COPTPA use the same framework of COPPA, Second Edition (2017), including its seven areas of evaluation and many of its sub-areas, it is possible to map the standards of COPPA, second edition (2017) with those of COPPA:ODL and COPTPA.

5. Furthermore, for postgraduate programmes, COPPA, Second Edition (2017) is read together with "Standards: Master's and Doctoral Degree, Second Edition" published in 2021, which covers postgraduate programmes by research, coursework and mixed

mode. Hence, the standards stipulated in the document are also referred to when formulating guidelines for the development and delivery of postgraduate programmes.

6. The GGP: PDD deals with all three sub-areas listed under Area 1 of COPPA, Second Edition (2017) on Programme Design and Delivery), which are as follows:

    i. Statement of Educational Objectives of Academic Programme and Learning Outcomes;
    ii. Programme Development: Process, Content, Structure and Learning-Teaching Methods;
    iii. Programme Delivery.

7. The layout of this document consequently reflects the three sub-areas of Area 1 in Sections 2 to 4. These sections incorporate all elements from the idea of a curriculum, the process of developing and designing the curriculum to programme delivery. The HEPs are expected to not merely copy the guidelines and the examples given in this document as appendices but to develop their own curriculum design and delivery processes which best fit the needs, specialism and requirements of the HEP and its students. In doing so, the HEPs are expected to keep abreast with the latest developments in the disciplines they offer.

8. Programme design and delivery is applied in the design of curricula and programmes as well as the modules that make up the curriculum and the programme, and reference to programmes in this document would include a reference to the courses therein.

Section 2

Statement of Educational Objectives of Academic Programme and Learning Outcomes

2.1 Overview

1. In general, the educational objectives of an academic programme refer to a set of broad statements that describe the career and professional accomplishments to be achieved by students of the programme after they graduated. Such a statement is popularly known as Programme Educational Objective (PEO) and is directly related to and linked to one or more Learning Outcome(s) of the programme, known as Programme Learning Outcome (PLO).

2. While PEOs represent graduates' accomplishments during their early working and professional life, PLO implies the outcomes to be attained by them upon completing the programme. Specifically, a set of PLOs refers to statements that describe the specific and general knowledge, skills, attitudes and abilities that they as the programme's graduates should demonstrate through their accumulated learning experience upon completion of all the courses in their programme.

3. Hence, the formulation of the PEO statements should consider job opportunities or career options for the students when they graduate with the programme's certificate or degree, and they are expected to attain the learning outcomes stated in the PLO statements upon graduation.

2.2 Programme Educational Objectives

Related COPPA Standard:

1.1.1 The programme **must** be consistent with, and supportive of, the vision, mission and goals of the HEP.

Related COPPA:ODL Standard:

1.1.1 The programme **must** be consistent with, and supportive of, the vision, mission, goals and Open and Distance Learning (ODL) policy of the HEP, in promoting democratisation of education through globalised online learning.

Related COPTPA Standard:

1.1.1 The programme educational objectives **must** be consistent with and supportive of the vision, mission and goals of the TVET Provider. Following are the suggested TVET programme educational objectives for each level. *(Refer page 6, COPTPA)*

1.2.1 The programme **must** be consistent with and supportive of the vision, mission and goals of the TVET Provider.

4. The standards stipulate that a programme must be consistent and support the vision, mission and goals of the HEP. There are several mechanisms available that can be used to objectively demonstrate the programme support for these strategic statements. A common approach is to break up the vision and mission statements into component which can be mapped to the programme educational objectives and learning outcomes. Alternatively, if the HEP develops a set of institutional goals which includes a goal for its educational process and outcomes, this also can be incorporated into the mapping.

5. The formulation of the PEO statements can be based on a number of factors within internal and external contexts, as follows:

    i. Internal contexts of the PEO and the programme can be identified within the institution, such as the mission, vision and educational goals of the institution as well as any academic policies and procedures approved by the senate or academic board of the institution.

    ii. External contexts refer to requirements stipulated by the regulators such as the Ministry of Higher Education (MOHE), the Malaysian Qualifications Agency (MQA) as the country's quality assurance agency and other relevant governmental agencies, as well as statutory and professional bodies related to graduate registration and the profession.

6. The process of formulating the statements may begin with a gap analysis of the programme, involving tools like a SWOT (strength-weakness-opportunity-threat) analysis or a strengths-weaknesses analysis. The results of such an analysis may be used to draft the preliminary version of the PEO statements. This preliminary version may be refined and finalised upon completion of the needs assessments which may verify and validate the statements.

7. There may be additional requirements or desired attributes specified by the learned associations related to the programme discipline and the graduate profession, nationally and internationally, which the programme may want to address to add value to its curriculum on top of the minimum requirements stipulated by the MQF or the Programme Standards. These internal and external contexts are summarised in Figure 2.1.

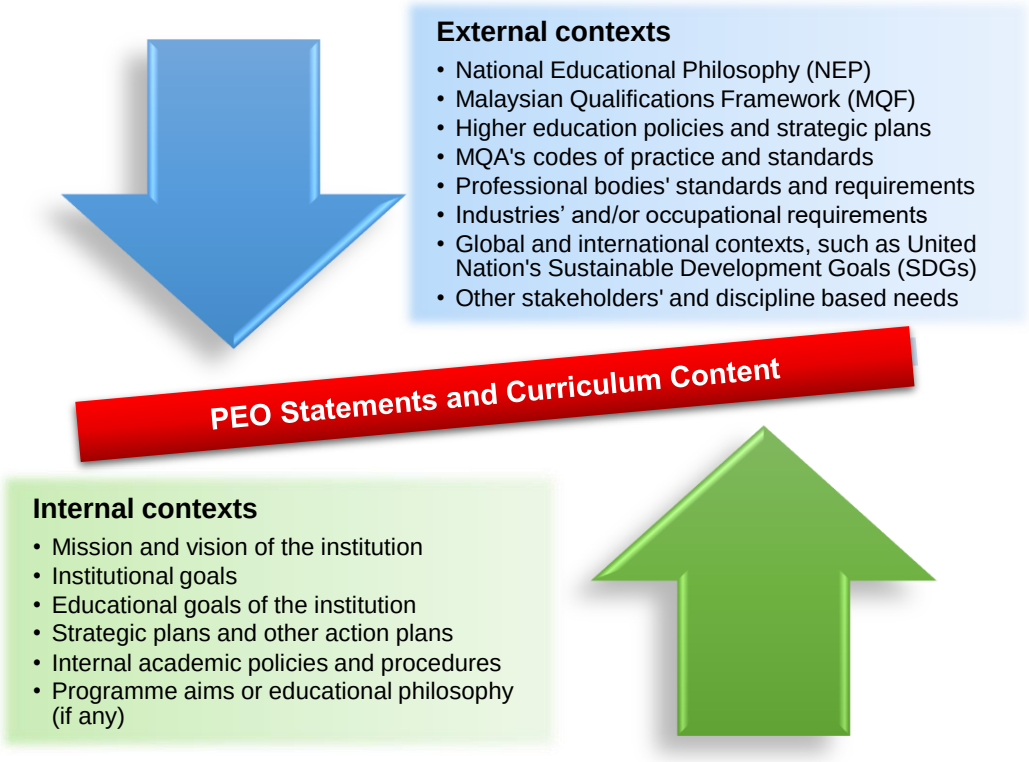

Figure 2.1: Internal and external contexts of a programme in the formulation of the PEO statements and the curriculum.

2.2.1 Linking of the Programme Educational Objective with the Institution's Educational Goals

8. In principle, the PEO statements should be aligned both with the stakeholders' needs through their desired attributes required by the profession and with the strategic direction of the HEP through desired graduate attributes. The personal and professional attributes could be gathered through mechanisms such as surveys and needs assessments (see also Section 1.2).

9. In the context of the HEP, the PEO statements need to be formulated so that the programme supports the statements of purpose of the institution, which include the mission, vision and institutional goals of the institution, particularly the goal that is related to the educational process. If the institution also defines the generic educational philosophy, a core belief, an overarching framework for its educational programmes or the generic graduate attributes at the institutional level known as educational goals, these aspects also need to be considered in the formulation of PEO statements.

10. As a HEP, one or a set of educational goals should be established at the institutional level as stipulated by the COPIA and the Guide on Compliance Evaluation for Self-Accreditation Universities. Based on these references, the education goals refer to statements that define the generic graduate attributes of an institution and shall form the basis of the academic strategic plan of the institution in addition to other institutional goals. The educational goals also describe the crucial characteristics of the outcomes

and processes of higher education that are in keeping with national aspirations and global importance and are aligned to the institution's mission and vision.

11. The goals may also take into account the National Education Philosophy and the government's aspiration as indicated in the Malaysia Education Development Plan 2015 – 2025 aiming to produce holistic, balanced and entrepreneurial graduates. Hence, it is imperative that the PEO statements should be directly related and linked to the educational goals, while embedding elements of graduate attributes desired by the stakeholders and the graduate's career opportunities.

12. Formulation of the statements is typically based on aspects of the knowledge, skills and attitudes expected from the graduates, including competence as well as interpersonal and professional behaviours, when they are in their working life and/or when performing their professional tasks. With that, the PEO can be implemented through the PLO that is also directly connected to the PEO, normally represented by a PEO-PLO map, which also later facilitates its measurement of achievement using appropriate tools and instruments. A summary of all characteristics of a set of PEO statements is listed in Figure 2.2.

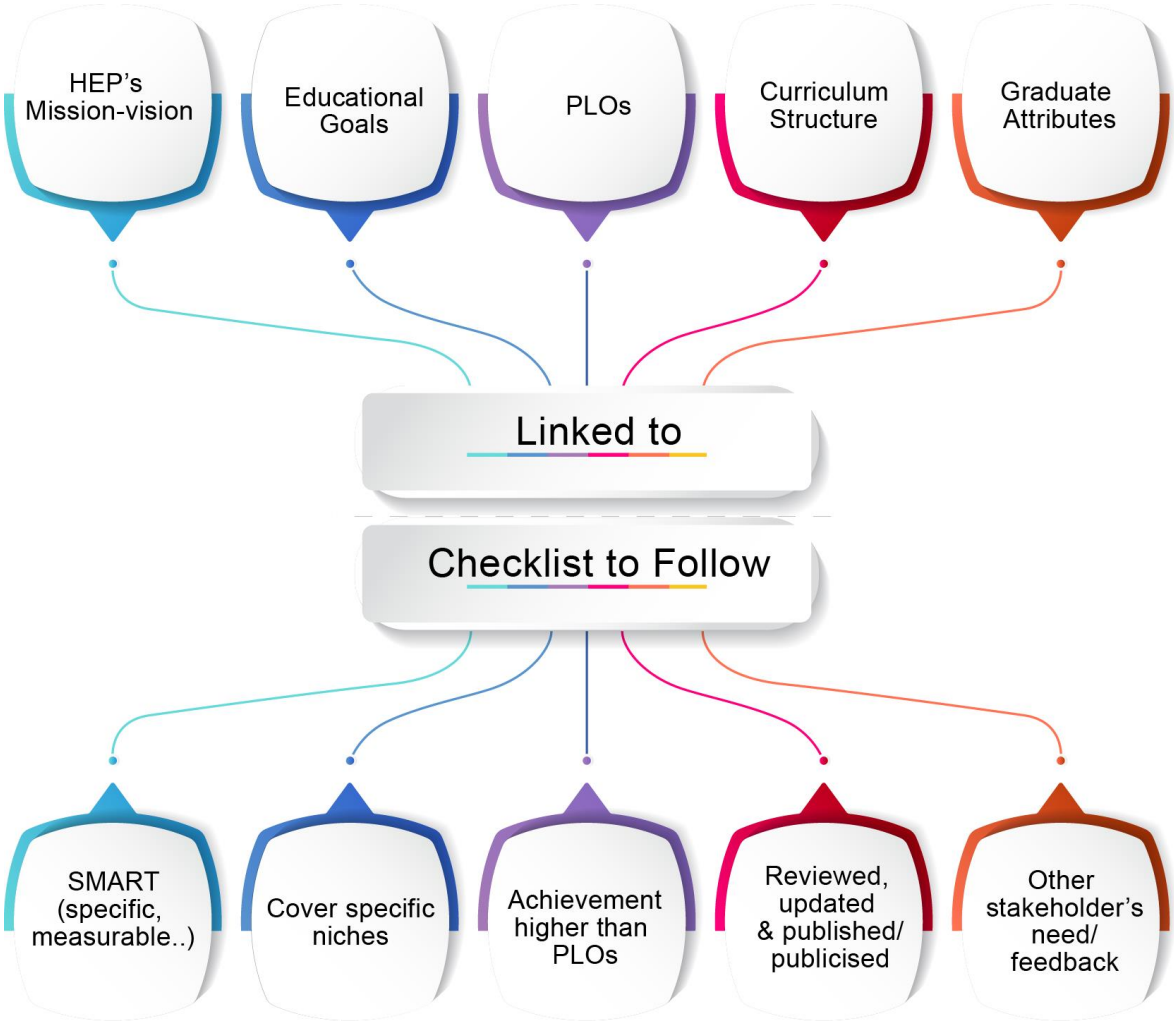

Figure 2.2: Characteristics of the PEO statements.

2.2.2 Measurement of the Programme Educational Objectives

13. The PEOs can be measured in two ways, namely directly and indirectly. For a direct measurement, the PEO statements should be formulated based on the principle that the statements need to be specific, measurable, achievable/attainable, realistic and with time-bound. This principle refers to the SMART principle (see also Section 3.3.1).

14. As the PEO can only be measured either by the graduates themselves through self-assessment or evaluated by their employers, typical instruments or mechanisms that are commonly used are surveys or engagement platforms such as focused group discussions between the programme and the graduates and employers.

15. In measuring the achievement of PEOs, direct or objective measurement may be carried out through surveys using direct questions, such as current salary, position or roles in the organisation and information about career or professional development status.

16. Perception-based or subjective questions that are related to indirect measurement may be included using the appropriate rating scale, such as a Likert scale. To increase its measurability and facilitate the analysis of its results, performance criteria in the form of indicators with targets may be defined for each PEO statement. An example of several PEO statements for a Bachelor of Computer Science (BCS) programme, with the corresponding performance indicators and targets, is illustrated in Table 2.1.

Table 2.1: Examples of PEO statements with performance indicators and targets for a Bachelor of Computer Science (BCS) programme.

PEO Statement	Domain	Performance Criteria	
		Indicator	Target*
1. Graduates who are knowledgeable and technically competent in solving real and complex problems in their successful career or professional practice in computer science.	Knowledge and skills	▪ Graduates who achieve confirmation of their position or promotion to a higher rank in the organisation. ▪ Graduates who are involved in and successfully complete at least one main project of the organisation as a key team member.	50% 30%
2. Graduates who demonstrate professional and personal leadership related to computer science, as well as commitment towards sustainable development for the benefit of society and the environment.	General attributes and attitudes	▪ Graduates who are appointed to a position with the responsibility to lead a group or team of staff. ▪ Graduates who successfully organise community service or activities that benefit society or are related to sustainable development.	30% 30%
3. Graduates who are engaging in formal or non-formal learning opportunities in order to maintain and enhance their technical competencies and professional growth in computer science and related areas.	Lifelong learning and professional development	▪ Graduates who are pursuing their study in a formal education leading to a higher degree or engaging in continuous professional development activities or courses for at least 20 hours per year. ▪ Graduates who are appraised in their organisation as an excellent person or for their exemplary personality.	50% 30%

*Measured at 2 – 5 years after graduation, which can be increased as part of the continual quality improvement process of the PEOs.

17. As the PEOs indicate attributes and qualities of the programme graduates during their early working and professional life, it is important to capture these desired graduate attributes expected by external stakeholders, such as the employers and the labour market, in which they are participating within a suitable time frame. The time frame to capture these desired graduate attributes should be within a few years after graduation, such as within 2-5 years to allow the graduates to adapt and adjust themselves to the working environments as part of their career development.

18. However, for programmes with a shorter duration of study, such as MQF Level 4 or 7 programmes, a period shorter than 2 years can be used to measure the PEO achievement as the graduates or degree holder may require lesser time to adapt into his/her working life and be able to demonstrate desired attributes envisaged by the PEOs.

2.2.3 Continual Quality Improvement of the Programme Educational Objectives

19. Similar to any other curriculum components, such as PLOs and courses, the PEO statements need to undergo the systematic and structured processes of monitoring, reviewing and continual quality improvement (CQI) as stipulated by the academic quality assurance processes or a quality management system of the institution.

20. A typical CQI cycle or a set of periodical stages of planning, implementing, monitoring, reviewing and improving can be undertaken in order to continually improve the PEO statements and their alignment with all the regulatory requirements and the stakeholders' needs. This CQI process, including the PEO measurements and achievements, is given in Figure 2.4.

2.2.4 Specific Considerations for Open and Distance Learning, Technical and Vocational Education and Training and Postgraduate Programmes

21. For ODL programmes, the formulation of the PEOs needs to take into account the ODL policy of the HEP. Before offering ODL programmes, the HEP needs to develop the ODL, which is aimed at promoting the democratisation of education through globalised online learning, and provide appropriate mechanisms and platforms, such as a well-equipped learning management system (LMS) and self-instructional materials (SIMs), so that the programme can be offered via the ODL mode.

22. For TVET programmes, the PEO statements should consider and be aligned with the suggested TVET's PEOs for the MQF Levels 1 – 6 listed on page 6 of COPTPA. These statements need to conform with the definition of TVET as defined by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) in 2015 and the scope of TVET as defined in COPTPA (refer to pages 1 – 2, COPTPA). Furthermore, they should be consistent with the vision, mission and goals of the TVET providers so that the programme could produce a competent workforce in related fields for the achievement of the socio and economic objectives of the country.

23. For postgraduate programmes, the PEO statements should consider and be aligned with the general goals of the postgraduate programme development as stated in "Standards: Master's and Doctoral Degree (SMDD), Second Edition" published in 2021, namely

SMDD by Research and SMDD by Coursework and Mixed Mode (Coursework and Research). In addition to being consistent with the institutional vision, mission and goals, the PEO statements should seek to challenge the candidates and graduates to contribute to the achievement of Sustainable Development Goals (SDG) for greater socio-economic impacts.

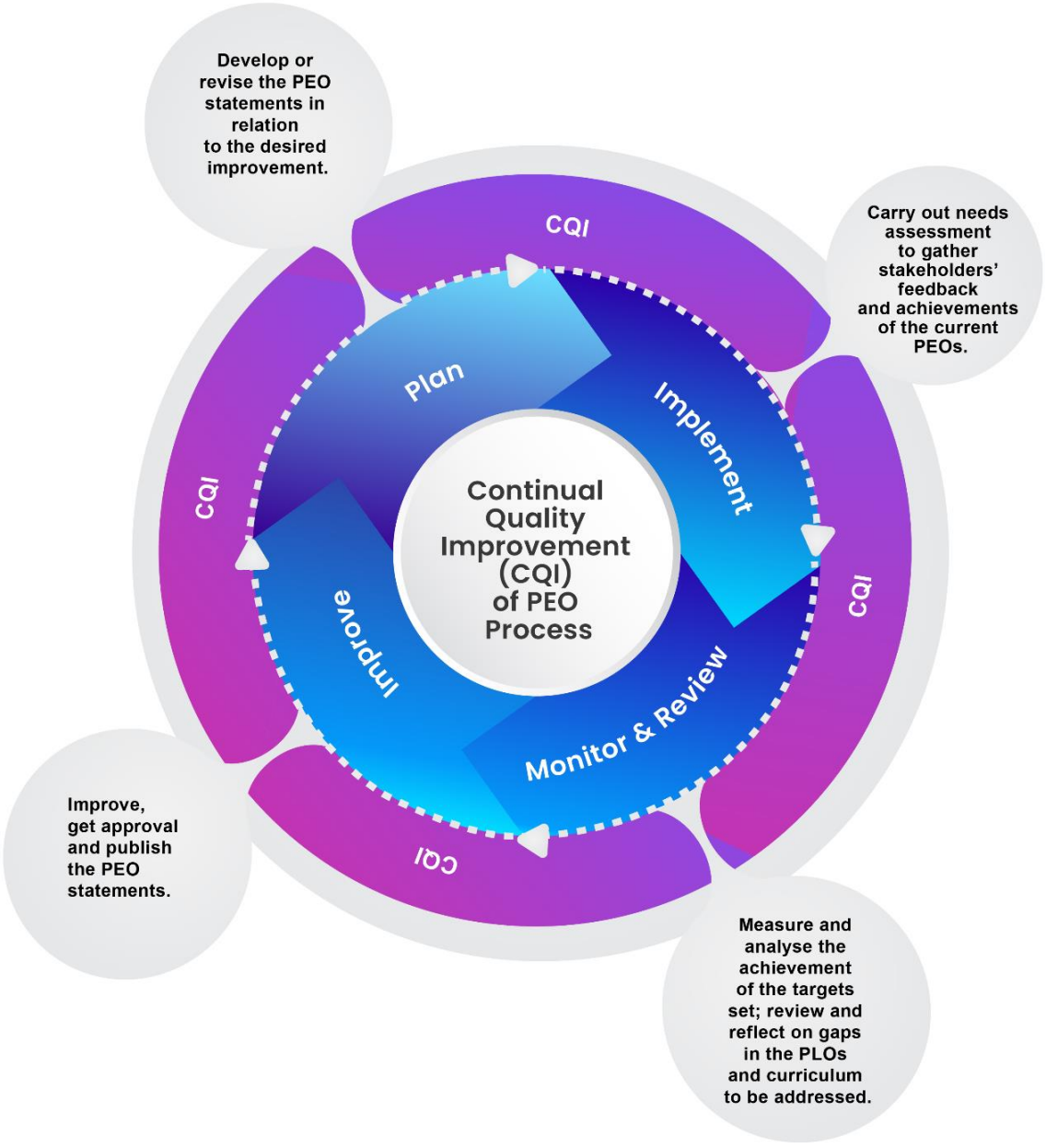

Figure 2.4: Continual quality improvement of the PEO achievements.

2.3 Needs Assessment for Programme Proposal

Related COPPA Standard:

1.1.2 The programme **must** be considered only after a needs assessment has indicated that there is a need for the programme to be offered. *(This standard must be read together with standards 1.2.2 in Area 1, page 4 and 6.1.6 in Area 6, page 38)*

Related COPPA:ODL Standard:

1.1.2 The programme **must** be considered only after a needs assessment has indicated that there is a demand for the programme to be offered via ODL mode.

Related COPTPA Standard:

1.2.2 The programme **must** be considered only after a needs assessment has indicated that there is a need for the programme to be offered. TVET Providers **must** have a formal committee system responsible for internal and external consultation, feedback, market and occupational needs analysis and employability projections of the programme in line with the new, emerging areas of technology of the programme.

24. In regards to the above standards, a needs assessment may be defined as the systematic gathering of data and analysis of all objective and subjective information necessary to define, defend and validate purposes in developing or revising the curriculum that satisfy the learning requirements of students within the context of particular institutions that influence the learning and teaching approach and assessment of students' learning outcomes.

25. The process of needs assessment can begin with the development of a survey questionnaire by the curriculum development or programme review committee to capture these needs, as well as other inputs for the curriculum and the programme, including the suitability of the PEO and PLO statements to be proposed in a new programme proposal or a programme review paper in the perspective of the programme's stakeholders as stipulated by the standards, in order to ensure currency and relevance of the curriculum.

26. The information leading to the identification of these graduate attributes and to provide inputs to curriculum development or programme review should be gathered systematically using appropriate instruments, such as surveys and questionnaires sent to the alumni and their employers. In addition, it can also be sent to other stakeholders who may know the job requirements and market trends in the field from a broader perspective. This refers to "needs assessment".

27. Building a survey may start with establishing its main objectives and target respondents, followed by the construction of relevant questions. Typically, a survey for a needs assessment may contain the following components:

    i. Introduction — a summary of the survey's purpose or objectives, together with a confidentiality statement or disclaimer, if necessary.

    ii. Demography of respondents — as respondents could be students, academic staff, graduates, alumni, employers or general stakeholders, general questions such as age group, sex and educational background can be asked to gather information on the respondent background.

iii. Questions related to elements covered in the needs assessments, such as the proposed PEOs and PLOs, graduate attributes and others related to curriculum development or programme review:

- To gather feedback on the PEO or PLO statements, each statement may be itemised to form a collection of features linked to the statement, and the respondent is requested to evaluate either the whole statement or these features using a Likert scale based on his/her agreement level.
- To gather feedback on desired graduate attributes and job requirements, more stakeholders within the spectrum related to the discipline with questions listing possible current and future skills to be acquired.
- To assess the performance of any graduate who works under his/her supervision or care in the case of programme review, the respondent can be requested to evaluate the performance level of the graduate based on a list of graduate attributes that are linked to the PEO or PLO statements using a Likert scale.

iv. Other comments — this is to capture any other comments, which might not be covered in the structured questions, to allow the respondent to give justification on certain evaluations made earlier.

28. Alternatively, similar feedback may also be gathered by using other specific methods such as the Delphi method by consulting the curriculum or discipline experts, the Tuning project initiated by the European Community by engaging in a series of structured activities to refine the PEO and PLO statements based on stakeholders and societal needs, and by employing a focus group discussion among the targeted stakeholder representatives to reach a consensus.

29. During the programme delivery, with help from the programme advisory panel, the survey questionnaire can be verified to ensure its content is suitable for stakeholders to understand and provide feedback. Then, the results are analysed using statistical methods or data analytics, which could validate and be used to improve the needs assessment prior to or concurrently with the programme review. The review process should include the CQI of the PEO and PLO statements based on internal and external stakeholders' feedback.

2.3.1 Specific Considerations for Open and Distance Learning, Technical and Vocational Education and Training and Postgraduate Programmes

30. For ODL programmes, the development of the questionnaires for needs assessments should consider that the programme is offered entirely via an ODL mode. Hence, the survey may include questions about elements appropriate mechanisms and platforms, such as a well-equipped LMS), online learning materials and SIMs.

31. For TVET programmes, the development of the needs assessments is to be overseen by a formal committee system, which is responsible for internal and external consultation, feedback, market and occupational needs analysis and employability projections of the programme in line with the emerging areas of technology of the programme.

32. For a postgraduate programme, the programme, including its PEOs and learning outcomes needs to be formulated with relevant internal and external stakeholders and be reviewed in consultation with them. The external stakeholders may be represented by the employers of the students or graduates, including the working or part-time students, as well as relevant industries, while the internal stakeholders may refer to the students and academic staff involved in the programme delivery.

2.4 Relationship between Programme Educational Objectives and Learning Outcomes

Related COPPA Standard:

1.1.3 The department **must** state its programme educational objectives, learning outcomes, teaching and learning strategies, and assessment, and ensure constructive alignment between them. *(This standard must be read together with standard 1.2.4 in Area 1, page 6)*

Related COPPA:ODL Standard:

1.1.3 The department **must** state its programme educational objectives, learning outcomes, teaching and learning strategies that focus on student engagement, and assessment, and ensure constructive alignment between them.

Related COPTPA Standard:

1.2.3 The programme **must** define its TVET objectives, learning outcomes and deliveries including learning and teaching strategies, assessments, and the constructive alignment between them.

33. For a programme to stay current and relevant and to be able to keep abreast with the latest requirements from the regulators and stakeholders' needs as well as to respond to the needs of the institution, the PEO statements need to be formulated to connect the institution's educational goals to the PLOs. These links should be demonstrated through the programme documentation approved by the senate or the academic board of the institution.

34. At the programme level, the PEOs can be deployed using a PEO-PLO map, where each of the PEOs should be directly connected to the relevant PLOs. If the PEOs and the PLOs are mapped explicitly, the map can later be used to correlate the PEO achievements with the PLO measurements using appropriate statistical tools. An example of a framework connecting educational goals, the PEOs and the PLOs of the BCS programme, where its PEOs are listed in Table 2.1, is depicted in Figure 2.5. In formulating the PEOs, PLOs and curriculum of the programme, any requirements stipulated by the government and the ministries, particularly the Ministry of Higher Education (MOHE) through appropriate blueprints, strategic plans, policies, guidelines, relevant circulars, etc., should also be considered by the HEP.

35. An example of a PEO-PLO map for the PEO statements listed in Table 2.1 is presented in Table 2.2. The PLOs are formulated based on the five learning outcome clusters of the MQF Second Edition, including all the subdomains or attributes in each respective cluster.

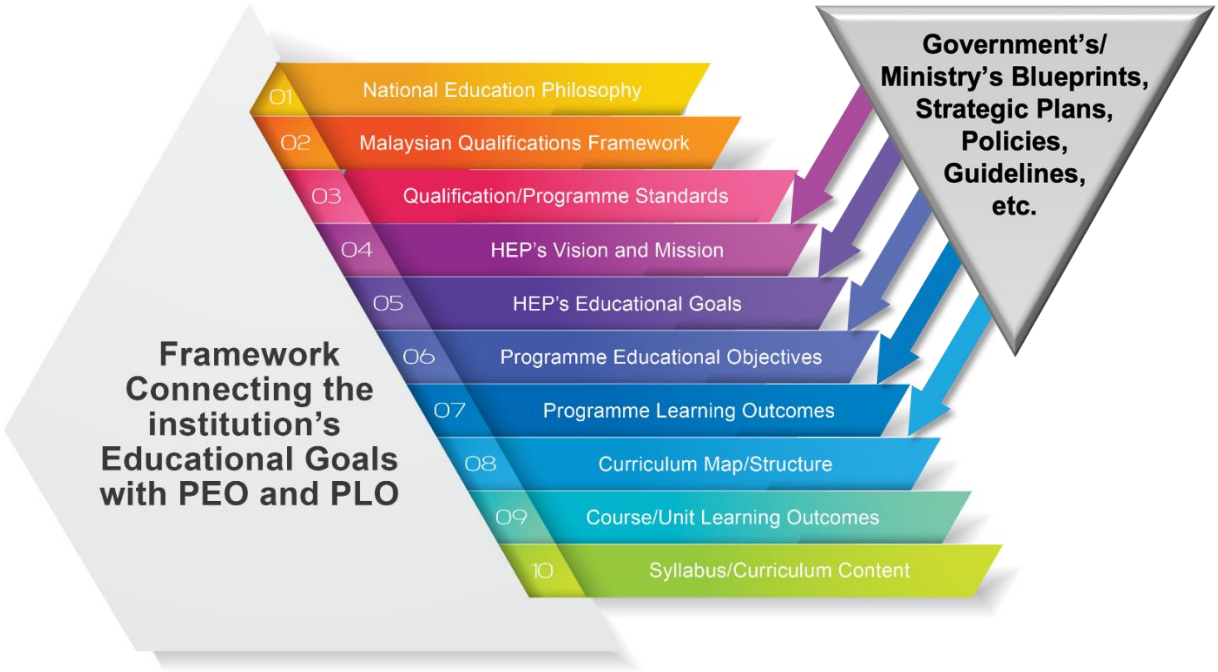

Figure 2.5: An example of a framework connecting the institution's educational goals with the PEOs and PLOs of an academic programme.

Table 2.2: An example of a PEO-PLO map based on the MQF Second Edition for the BCS programme.

PEO*	Cluster 1	Cluster 2	Cluster 3						Cluster 4		Cluster 5
	Knowledge and Understanding	Cognitive Skills	Practical Skills	Interpersonal Skills	Communication Skills	Digital Skills	Numeracy Skills	Leadership, Autonomy and Responsibility	Personal Skills	Entrepreneurial Skills	Ethics and Professionalism
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9	PLO 10	PLO 11
1	✓	✓	✓			✓	✓				
2				✓	✓			✓		✓	
3									✓		✓

*Refer to Table 2.1.

36. After establishing the map connecting the educational goals, the PEOs and the PLOs of the programme, it could be extended to form a curriculum map linking the PLOs directly to the learning outcomes at the course level, known as the course learning outcomes (CLO), through core and elective courses, and then to the lesson outcomes to connect

the CLOs with the content delivery and teaching and learning strategies of the courses that focus on student engagement. Simultaneously, each of the CLOs should be connected directly and explicitly to assessment methods and tasks through a systematic and structured documentation process to allow student assessments and student performance to be used as evidence to demonstrate their attainment on the CLOs and the PLOs.

37. If done correctly without elements of ambiguity and implicitness, the programme may put in place constructive alignment in its curriculum design, as can be demonstrated from the programme documentation. An example of a map connecting the courses and PLOs for the same programme as illustrated in Table 2.1 is depicted in Table 2.3.

38. In Table 2.3, the use of indicators, namely enabling, intermediate or reinforcing, and culminating or demonstrable learning outcomes. Alternatively, the indicators can be simplified into two categories, namely enabling and culminating outcomes, or even just a single, same indicator as depicted in Appendix 1 (see Table A3). The decision to select which model of mapping depends on how this mapping will be used during programme delivery. If it were to be used to facilitate constructive alignment during programme implementation or to act as the programme assessment plan, the mapping indicators should include one for culminating or demonstrable outcomes which will be used to determine attainment of the mapped PLOs through direct measurement from student assessments that are linked to the corresponding CLOs.

39. After putting in place all the requirements to ensure constructive alignment at the curriculum design stage, the programme can establish a programme assessment plan by connecting the PEOs, the PLOs, summarised teaching-learning activities or instructional strategies and assessment methods in all courses or selected PLO-demonstrable or culminating courses in one table as illustrated in Table 2.4. The framework or mechanisms to measure the PLO attainments may be referred to the programme standards or any other relevant documents, including its measurement intervals.

40. An examples of similar mappings and structures for a social science programme, namely the Bachelor of Education programme, is illustrated in Appendix 2. In this example, the mapping is defined in a way that there is only one mapping indicator used to represent a link between two interrelated objects. Using this mapping for the PLO-course map, it is expected that a course be explicit mapped to a PLO via one or more CLO(s), which are then aligned to appropriate teaching-learning activities and assessment tasks. The CLOs may be profiled as either enabling or culminating outcomes at the course level.

Table 2.3: An example of a PLO-Courses map for the BSC programme.

Bachelor of Computer Science (BCS) Course Name	Course Type*	Course Credit	Programme Learning Outcomes** (PLO)										
			1	2	3	4	5	6	7	8	9	10	11
YEAR 1, SEMESTER 1													
Computer Programming	Core	4	☐	☐	☐			☐					
Systems Thinking	Core	3	☐	☐					☐				
Computer Architecture and Operating System	Core	3	☐		☐			☐					
Discrete Mathematics	Core	3	☐	☐					☐				
Statistics and Probability	Common	3	☐	☐					☐				
Foundation English	Common	2				☐	☐				☐		
Total		**18**											
YEAR 1, SEMESTER 2													
Databases	Core	4	☐	☐	☐				☐				
Data Structures	Core	3	☐	☐	☐								
Computer Networking Technologies	Core	3		☐	☐			☐					
Information Technology and Modern Lifestyle	Common	3					☐	☐		☐	☐		
Academic Communication	Common	2				☐	☐				☐		
Appreciation of Ethics and Civilisation (MPU U1)	General	3				☐					☐		☐
Total		**18**											
YEAR 2, SEMESTER 1													
Advanced Databases	Core	3	⊡	⊡	⊡				⊡				
Object Oriented Programming	Core	3		⊡	⊡			⊡					
Introduction to Artificial Intelligence	Core	3	⊡		⊡				⊡				
Management of Emotion	Common	3				☐					☐		☐
Communication at Workplace	Common	2				☐	☐				☐		
Philosophy and Current Issues (MPU U1)	General	3				☐					☐		☐
Co-curriculum (elective – MPU U4)	General	1				☐							☐
Total		**18**											
YEAR 2, SEMESTER 2													
Client Server Computing	Core	3	⊡		⊡			⊡		⊡			
Human Computer Interaction	Core	3	⊡	⊡			⊡			⊡			
Software Engineering	Core	3	⊡	⊡				⊡		⊡			
Data Communication & Telecommunication	Specialisation	3	⊡	⊡			⊡						
LAN & Wireless Switching	Specialisation	3	⊡	⊡	⊡								
Basic Entrepreneurship and Innovation (MPU U2)	General	2								☐	☐	☐	
Co-curriculum (elective – MPU U4)	General	1				☐							☐
Total		**18**											
YEAR 3, SEMESTER 1													
Compiler Construction	Core	3	■	■				■					
Project Proposal	Core	2			⊡		⊡						
Network Programming	Specialisation	3	■	■	■								
Routing Concepts and Protocols	Specialisation	3	■	■	■								
Computer and Network Security	Specialisation	3	■	■	■						0.2		
Thinking Philosophy	Common	3					■			0.2	0.4		0.2
Integrity and Anti-corruption *(MPU U3)*	General	2				⊡					0.3		0.4
Total		**19**											
YEAR 3, SEMESTER 2													
Design and Analysis of Algorithm	Core	3		■			■			0.2			
Final Project	Core	6			■		■	■	■				0.1
WAN Technology	Specialisation	3	■	■				■	■				
Cluster and Cloud Computing	Specialisation	3			■			■		■	■		
Computers, Ethics and Social Responsibility	Common	3				■	■					■	■
Total		**18**											
YEAR 4, SEMESTER 1													
Industrial Training (12 weeks)	Core	6			■	■	■			■	■		■
Industrial Project (12 weeks)	Core	6		■		■	■			■		■	■
Total		**12**											
TOTAL CREDITS		121											

*General courses are MPU courses; common courses are department's courses to complement programme core and specialisation courses.
**Indicators: ☐ Enabling learning outcome (LO); ⊡ Intermediate/reinforcing LO; ■ Culminating LO or PLO-demonstrable outcome.

Table 2.4: An example of a programme assessment plan for the BCS programme.

PEO *(see also Table 2.2)*	**PLO** *(see also Table 2.4)* At the end of the Bachelor of Computer Science programme, the students will be able to:	**Recommended Instructional Strategies and Assessment Methods**	**Courses Containing CLOs for Direct Measurement of PLO**
PEO 1 on knowledge and skills	1. Describe advanced and comprehensive, theoretical and technical knowledge related to computer science, and information and communication technologies.	▪ **Instructional strategies:** Blended learning, direct and interactive instructions. ▪ **Assessment methods:** Written tests and case studies.	▪ Compiler Construction ▪ Network Programming ▪ Routing Concepts and Protocols ▪ Computer and Network Security ▪ WAN Technology
	2. Apply critical, analytical and evaluation skills to resolve complex applications and handle unpredictable issues with creative and innovative solutions in computer science.	▪ **Instructional strategies:** Interactive instruction, modelling, brainstorming and self-directed learning. ▪ **Assessment methods:** Culminating assignments and projects.	▪ Compiler Construction ▪ Network Programming ▪ Routing Concepts and Protocols ▪ Computer and Network Security ▪ Design and Analysis of Algorithm ▪ WAN Technology ▪ Industrial Project
	3. Perform a range of essential methods and procedures to solving a broad range of complex problems in computer science.	▪ **Instructional strategies:** Blended learning, augmented reality and experiential learning. ▪ **Assessment methods:** Laboratory tasks and projects.	▪ Network Programming ▪ Routing Concepts and Protocols ▪ Computer and Network Security ▪ Cluster and Cloud Computing ▪ Final Project ▪ Industrial Training
	6. Use a broad range of information, media, and technology applications to support study and/or work.	▪ **Instructional strategies:** Interactive instruction, modelling and simulation. ▪ **Assessment methods:** Case studies and projects.	▪ Compiler Construction ▪ WAN Technology ▪ Cluster and Cloud Computing ▪ Final Project
	7. Use and combine numerical, graphical and visual data for study or project work.	▪ **Instructional strategies:** Direct and interactive instructions. ▪ **Assessment methods:** Written tests and case studies.	▪ Design and Analysis of Algorithm ▪ WAN Technology ▪ Final Project
PEO 2 on general attributes and attitude	4. Work together with different people in diverse learning and working communities in computer science as well as other groups locally and internationally.	▪ **Instructional strategies:** Case based learning, discussion forum and experiential learning. ▪ **Assessment methods:** Case studies and projects.	▪ Computers, Ethics and Social Responsibility ▪ Industrial Training ▪ Industrial Project
	5. Convey ideas both in written and/or oral forms using appropriate and different forms of presentation, confidently, accurately, and coherently in appropriate context in a well-structured manner to a diversity of audiences.	▪ **Instructional strategies:** Discussion forum, experiential learning and learning with peers. ▪ **Assessment methods:** Case study or project presentations and reports.	▪ Thinking Philosophy ▪ Design and Analysis of Algorithm ▪ Computers, Ethics and Social Responsibility ▪ Final Project ▪ Industrial Training ▪ Industrial Project
	8. Work autonomously and show leadership and professionalism in managing responsibilities within broad organisational parameters.	▪ **Instructional strategies:** Independent study, experiential learning and learning with peers. ▪ **Assessment methods:** Case studies and projects.	▪ Thinking Philosophy ▪ Design and Analysis of Algorithm ▪ Cluster and Cloud Computing ▪ Industrial Training ▪ Industrial Project
	10. Demonstrate entrepreneurial competency with selected project(s).	▪ **Instructional strategies:** Case based learning, experiential learning and learning with peers. ▪ **Assessment methods:** Case studies and projects.	▪ Computers, Ethics and Social Responsibility ▪ Final Project ▪ Industrial Project
PEO 3 on lifelong learning and professional develop-ment	9. Integrate effectively in self-directed lifelong learning and professional pathways.	▪ **Instructional strategies:** Independent study and experiential learning. ▪ **Assessment methods:** Case studies and projects.	▪ Computer and Network Security ▪ Thinking Philosophy ▪ Cluster and Cloud Computing ▪ Final Project ▪ Industrial Training
	11. Identify ethical issues, make decision ethically, and act professionally within the varied social and professional environment and practice as well as local and global issues relating to science, technology, business, social and environmental issues.	▪ **Instructional strategies:** Case based learning, discussion forum and experiential learning. ▪ **Assessment methods:** Case studies and projects.	▪ Thinking Philosophy ▪ Computers, Ethics and Social Responsibility ▪ Final Project ▪ Industrial Training ▪ Industrial Project

2.4.1 Specific Considerations for Open and Distance Learning, Technical and Vocational Education and Training and Postgraduate Programmes

41. For ODL programmes, the relationship and constructive alignment linking PEOs, PLOs, CLOs, teaching and learning activities and assessment methods as depicted in Figure 2.6 and Table 2.3 should take into account that the programme is delivered entirely via an ODL mode.

42. For TVET programmes, the relationship and constructive alignment linking PEOs, PLOs, CLOs, teaching and learning activities and assessment methods as depicted in Figure 2.6 and Table 2.3 should consider the nature and scope of a TVET programme as defined in COPTPA, including related occupational/industry standards, stipulated learner's competencies and criteria on competency-based assessment.

43. For postgraduate programmes, the relationship and constructive alignment connecting PEOs, PLOs, CLOs, teaching and learning activities and assessment methods as depicted in Figure 2.6 and Table 2.3 may still be applicable directly or with some adaptation for coursework and mixed-mode programmes. However, for a full research programme, with no or inconclusive mechanism to demonstrate the attainment of PLOs through CLOs, Figure 2.6 and Table 2.3 may be improvised, such as, by mapping the research progress and supervision activities and assessments directly to the PLOs.

2.5 Programme Learning Outcomes and Malaysian Qualifications Framework Compliance

Related COPPA Standard:

1.1.4 The programme learning outcomes **must** correspond to an MQF level descriptors and the five clusters of MQF learning outcomes (*see the list below*):

Related COPPA:ODL Standard:

1.1.4 The programme learning outcomes **must** correspond to an MQF level descriptors and the five clusters of MQF learning outcomes (*see the list below*):

Related COPTPA Standard:

1.2.4 The programme learning outcomes **must** correspond to an MQF level descriptors and the five clusters of MQF learning outcomes (*see the list below*):

Five clusters of MQF learning outcomes:

i. Knowledge and understanding
ii. Cognitive skills
iii. Functional work skills with focus on:
    a. Practical skills
    b. Interpersonal skills
    c. Communication skills
    d. Digital skills
    e. Numeracy skills
    f. Leadership, autonomy and responsibility
iv. Personal and entrepreneurial skills
v. Ethics and professionalism.

44. PLOs are statements that describe the specific and general knowledge, skills, attitudes and abilities that the graduates should demonstrate upon graduation. The graduates are expected to acquire the outcomes upon the completion of all the courses in their programme. Explicit and transparent PLO statements indicate the programme's disciplinary identity.

45. The department should make sure that threshold academic standards are met in their awards by aligning PLOs with the relevant qualification descriptors in the national frameworks for higher education qualifications, i.e., the MQF. The HEP, together with the department, are responsible for ensuring the successful delivery of the PLOs, as well as monitoring and reviewing them on a regular basis to guarantee their relevance, clarity and specificity.

2.5.1 Malaysian Qualifications Framework Level Descriptors

46. The MQF level descriptors define the expected knowledge, capabilities and/or competencies of learners on successful completion of the learning programmes that are translated and contextualised by the specific subject or discipline, technical and vocational, and professional fields. The level of descriptors differentiates the depth,

breadth and complexity of knowledge, skills and values. The descriptor for each qualification type is more specific to underpin consistency in graduate outcomes for the qualification type regardless of the discipline.

47. To accommodate the variety of learning contexts, such as academic, professional, technical, and vocational settings, as well as the workplace, level descriptors (refer to Appendix 3, MQF Second Edition, 2017) provide guidance to curriculum developers when writing learning outcomes at various levels and qualifications.

2.5.2 Five Clusters of Malaysian Qualifications Framework Learning Outcomes

48. Changes in the educational landscape, the need for employability skills, meeting market expectations, the widespread use of educational technologies, and the need for standards in the TVET sector are among the reasons for revising the first edition of the MQF issued in 2005 (referred to as the MQF First Edition).

49. In the MQF First Edition, eight domains of generic learning outcomes and 16 specific learning outcomes were established and operationalised. These MQF eight domains have been clustered, re-profiled, and retained in accordance with the National Education Philosophy (1996), Malaysia Education Blueprint (2013 – 2025) and Malaysia Education Development Plan (2015 – 2025) (Higher Education).

50. The new edition of the MQF was benchmarked against the ASEAN Qualifications Reference Framework (AQRF), which specifies four domains of applied competencies, including cognitive, functional, personal and ethical competencies, as well as two domains of level descriptors: Knowledge and Skills; Application and Responsibility.

51. The five clusters of learning outcomes in the MQF Second Edition are as follows:

    i. Knowledge and Understanding
    ii. Cognitive Skills
    iii. Functional Work Skills with a focus on:
        a. Practical Skills
        b. Interpersonal Skills
        c. Communication Skills
        d. Digital Skills
        e. Numeracy Skills
        f. Leadership, Autonomy and Responsibility
    iv. Personal and Entrepreneurial Skills
    v. Ethics and Professionalism

52. The transition from the MQF First Edition to the MQF Second Edition is outlined in Figure 2.6. This may involve re-analysing and synthesising the learning outcome domains (LODs) of the MQF First Edition and all the respective sub-domains into a list of skills and competences to be considered for transition to the MQF Second Edition learning outcome clusters (LOCs), together with new or redefined skills and competences based on current scenarios, such as those related to SDGs and the fourth industrial revolution. The development of the required skills and competences has to be guided by the programme standards and any discipline requirements. Finally, the required skills and competences are then consolidated and re-clustered into the MQF Second Edition LOCs as outlined in Paragraph 51.

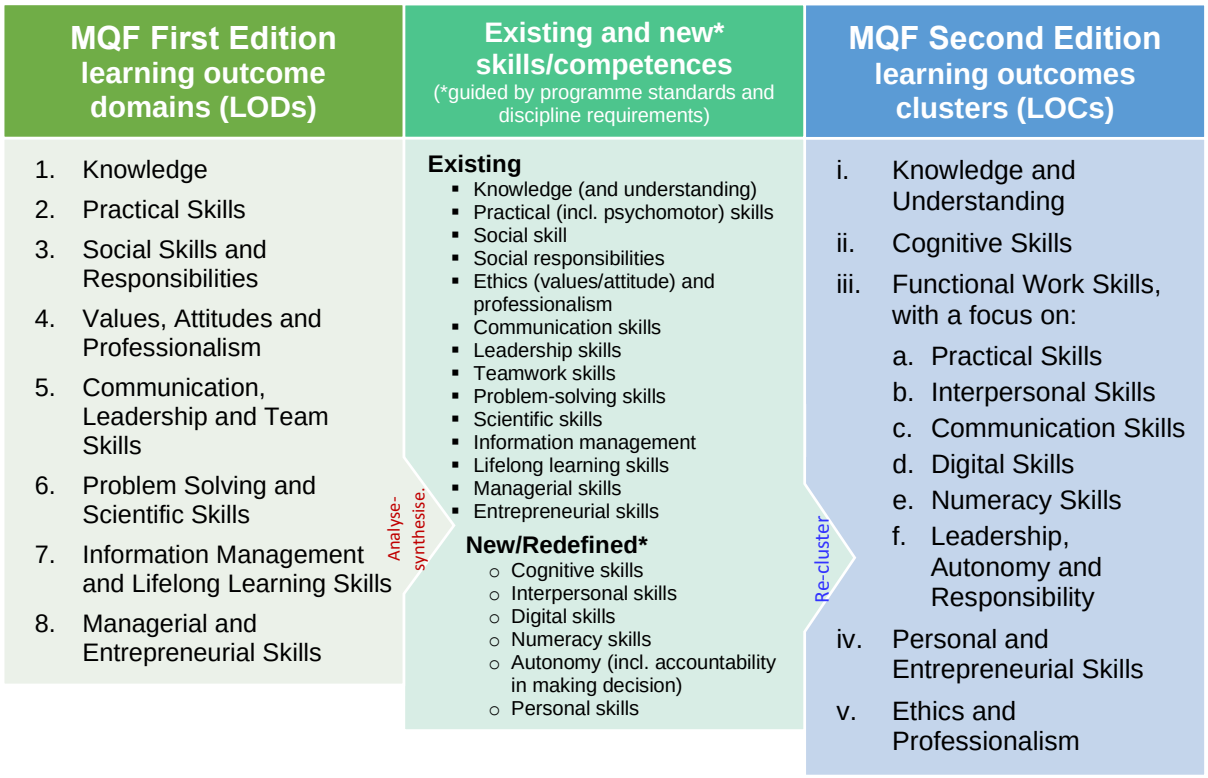

Figure 2.6: An example of a transition process from the MQF First Edition to the MQF Second Edition for an existing curriculum.

53. Cognitive competence consists of two learning outcomes domain: knowledge and understanding and cognitive skills. The difference between these is: knowledge and understanding refer to a systematic understanding of concepts, theories, technical knowledge, etc.; cognitive learning outcomes refer to the ability to apply knowledge and skills.

54. The MQF Second Edition has expanded the definition and scope of practical skills to include work skills and operational skills that are relevant in a common workplace, as well as discipline-specific or occupation-related work skills and professional practices.

55. Digital and numeracy are among the skills emphasised in the MQF Second Edition to prepare graduates with new skill sets for the future. Digital skills are not limited to the ability to use information/digital technologies. In one of the MOHE playbooks, "Quick Reference: 5 Clusters of Learning Outcomes MQF 2.0" (MOHE-2020), the five derivatives skills are digital design, social media, device and apps, digital collaboration and digital ethics and etiquette.

56. Possessing personal and interpersonal attributes is an advantage for graduates so that they have strong and good inner characters, as well as be able to interact with people from various backgrounds and cultures. The key difference between the two is that personal skills are the abilities that an individual possesses which are his or her strengths, whereas interpersonal skills are the collection of abilities that a person requires to communicate with others positively and effectively.

57. All programmes across disciplines should cumulatively address the five clusters of learning outcomes and eleven learning outcomes domain appropriately for the different levels of qualification to develop individuals with balanced and holistic skill sets.

2.5.3 Formulation of Programme Learning Outcomes

58. PLOs should be constructed in a way that strategically corresponds to CLOs, with data from CLOs informing PLOs both quantitatively and qualitatively. The learning outcomes are explicit statements that explain the needed learning attainment which reflects the complexity of the level, which must be fulfilled upon graduating to ear the degree.

59. Commonly, a PLO statement begins with, "*At the end of the Bachelor in/of XXXXX, the students will be able to …*" for an undergraduate programme. Vice versa, a CLO statement begins with, "*At the end of the course/learning duration, the students will be able to …*". Practically, these initial phrases may also be omitted in a listing of PLOs or CLOs without losing their meanings.

60. The LO statements should utilise the 'action verb' to specify the desired student performance, followed by a specific description of the course-specific content target ('content area') with the appropriate SMART characteristics. It is advisable to keep the statement brief and focus on one single outcome.

61. The HEP needs to refer to the programme standards by disciplines or field of study, which also explain the learning outcomes in accordance with the need of the discipline or field of study. Examples of PLO statements for different MQF levels based on descriptors are shown in Appendix 3 (extracted from the MQF Second Edition, 2017).

2.5.4 Mapping Programme Learning Outcomes to Clusters of Malaysian Qualifications Framework Learning Outcomes

62. Table 2.5 and Table 2.6 illustrate the alignment framework of the PLOs to an MQF level descriptors and the five clusters of MQF learning outcomes.

Table 2.5: Alignment of the Programme Learning Outcomes to the MQF level descriptors and the five clusters of the MQF learning outcomes.

	Programme Learning Outcomes	MQF LO Clusters
1.	Describe advanced and comprehensive, theoretical, and technical knowledge (and demonstrate relevant skills in a specialised field, or of a multidisciplinary nature) related to (the field of study, work and/or practice).	Cluster 1: Knowledge and understanding
2.	Apply critical, analytical and evaluation skills to resolve complex applications and handle unpredictable issues with creative and innovative solution (in the field of study/work/practice).	Cluster 2: Cognitive Skills
3.	Perform (a range of essential methods and procedures to solve a broad range of complex problems) in (the field of study, work and/or practice).	Cluster 3: Practical Skills

4.	Work together with different people in diverse learning and working communities (in the field of study) as well as other groups locally and internationally.	Cluster 3: Interpersonal skills
5.	Convey ideas both in written and/or oral forms using appropriate and different forms of presentation, confidently, accurately, and coherently in an appropriate context in a well-structured manner to a diversity of audiences.	Cluster 3: Communication skills
6.	Use a broad range of information, media, and technology applications to support study and/or work.	Cluster 3: Digital Skills
7.	Use and combine numerical and graphical/visual data for study/work.	Cluster 3: Numeracy Skills
8.	Work autonomously and show leadership and professionalism in managing responsibilities within broad organisational parameters.	Cluster 3 Leadership, Autonomy and Responsibility
9.	Integrate effectively in self-directed lifelong learning and professional pathways.	Cluster 4: Personal Skills
10.	Demonstrate entrepreneurial competency with selected project(s).	Cluster 4: Entrepreneurial Skills
11.	Identify ethical issues, make decisions ethically, and act professionally within the varied social and professional environment and practice as well as local and global issues relating to science, technology, business, society and environment.	Cluster 5: Ethics and Professionalism

Table 2.6: Mapping of PLO statements against the eleven LODs and five MQF clusters.

PLO	Cluster 1	Cluster 2	Cluster 3						Cluster 4		Cluster 5
	Knowledge and understanding	Cognitive Skills	Practical Skills	Interpersonal Skills	Communication Skills	Digital Skills	Numeracy Skills	Leadership, Autonomy and Responsibility	Personal Skills	Entrepreneurial Skills	Ethics and Professionalism
1	✓										
2		✓									
3			✓								
4				✓							
5					✓						
6						✓					
7							✓				
8								✓			
9									✓		
10										✓	
11											✓

2.5.5 Continual Quality Improvement of the Programme Learning Outcomes

63. The HEP must have clear policies and appropriate mechanisms for regular programme and curriculum monitoring and reviewing, including the PLO attainment, to ensure its currency and relevance. The monitoring and review process can be achieved through constructive engagement with stakeholders, including alumni and employers, as well as external experts whose views are considered for the CQI. This is illustrated in Figure 2.7.

64. The department should explore the linkages between courses and their PLOs after completing assessment cycles to offer adequate and useful data from both. This practice is part of a monitoring system that helps to improve the quality of the student experience by allowing ongoing evaluation, identifying areas for improvement and taking necessary and timely responses.

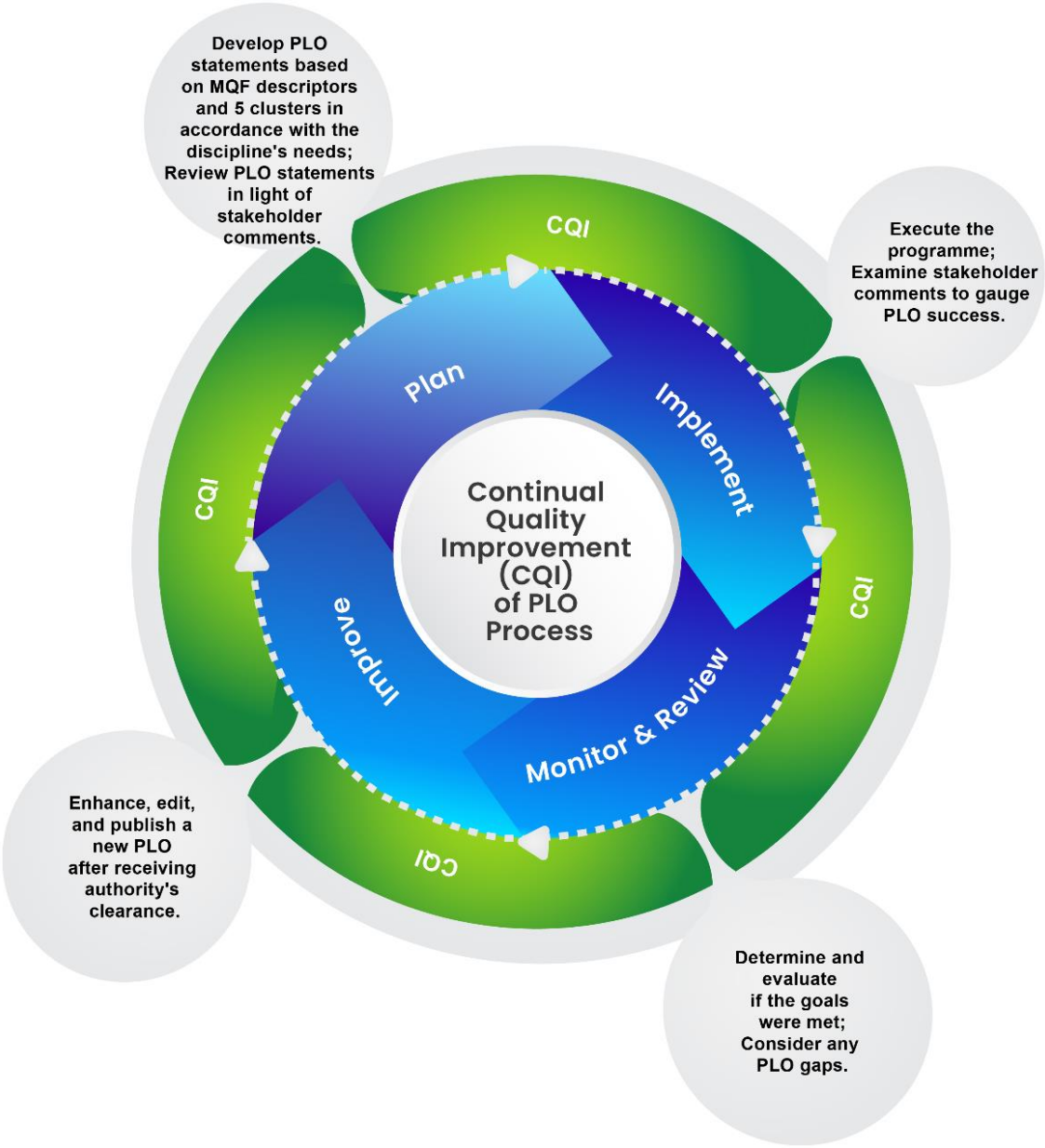

Figure 2.7: Continual quality improvement of the PLO achievements

65. Among the inputs to measure the PLO statements are the analyses of students' performance on the mid-term and final examinations, assignment scores, scores in projects, final marks, summary and analysis of each PLO, and whether targeted performance has been achieved. This data helps determine the programme's effectiveness and ensures that students acquire the programme's intended learning outcomes/competencies.

66. Among the supporting documents that reflect the alignment of PLOs to the five clusters of MQF learning outcomes are working papers on curriculum development and curriculum review approved by the HEP's Senate or Academic Board, supported by the corresponding meeting minute and MOHE/JKPT's approval.

2.5.6 Specific Considerations for Technical and Vocational Education and Training and Postgraduate Programmes

67. A TVET programme needs to refer to COPTPA during the construction of the learning outcomes and competency statements since it requires special attention to technical knowledge and industry occupational standards. Hence, the TVET providers need to align the scope of learning outcomes with the respective programme standards and the COPTPA as a minimum requirement for different qualification levels, as indicated in the TVET Learning Outcomes (refer to COPTPA, pages 9 – 15).

68. Postgraduate programmes need to refer to SMDD during the development of the learning outcomes statements as stipulated in Section 1.2 of the SMDD Second Edition, 2021. Depending on the mode of the programme learning outcomes for a postgraduate programme can be formulated by re-clustering the MQF learning outcomes listed in Table 2.4 to the ones listed on pages 2 – 3 of the SMDD by Research or on pages 28 – 29 of the SMDD by Coursework and Mixed Mode. The mappings of the postgraduate programme's learning outcomes stipulated by SMDD against the MQF learning outcomes can be referred to in Appendix 4.

2.6 Career and Further Studies Options

Related COPPA Standard:

1.1.5 Considering the stated learning outcomes, the programme **must** indicate the career and further studies options available to the students on completion of the programme.

Related COPPA:ODL Standard:

1.1.5 Considering the stated learning outcomes, the programme **must** indicate the career and further studies options available to the students on completion of the programme.

Related COPTPA Standard:

1.2.5 Considering the stated learning outcomes, the programme **must** indicate the career and further studies options available to the students on completion of the programme.

69. At the early stage of the curriculum development, especially before the PEO statements construction, the department must identify the appropriate National Education Code (NEC, 2020) to facilitate students, graduates, academia and industry in job matching involving various programmes and employment. The new NEC-2020 is also mapped to the Malaysia Standard Classification of Occupations (MASCO), which is a national occupational standard that aims to categorise occupational structures and job titles in the present market in line with Malaysia's economic growth, new technology and organisational changes.

70. A programme needs to indicate the career and further study options available after the completion of the programme. The PLOs should depict careers and further studies that are relevant to the discipline's current and emerging demands. This may be

accomplished by collaborating with key stakeholders, such as employers and/or linked industries.

71. The HEP or department needs to evaluate expected knowledge and skills, as well as competencies (particularly for TVET programmes), at the end of the programme with what is required by the related industry or market demand and the possibility to pursue higher studies.

72. In addition, the HEP or department needs to consult relevant stakeholders, industries or employers, including alumni, to ensure a relevant and prevalent career pathway. A list of job opportunities should be made available or published to the students during new students' orientation week, in the programme prospectus or the HEP's website.

73. The education pathway should indicate the sequence of qualifications that allow learners to move from one level to another vertically and should be published to the students upon the completion of the programme. This can be done through students' engagement sessions or made available at the department or the HEP's website or other official media.

74. Entrepreneurship can be featured as a career route for students in some academic programmes, especially in entrepreneurship-related degree.

75. The HEP or department may consider the following to ensure the curriculum design or learning outcomes are career-related:

    i. Incorporate career planning topics, case studies, projects or simulation-based learning into the curriculum to make it more relevant to students.

    ii. Allow students to explore career paths relevant to the course content by developing or practising employability skills or future abilities required in related professions.

76. The HEP may refer to relevant departments to better understand the student career route and professionalism pathway. The suggested department that can be referred to such as service and staffing schemes by referring to *Jabatan Perkhidmatan Awam* (JPA) and/or *Jabatan Pembangunan Kemahiran* (JPK) as well as to MASCO.

77. Figure 2.8 illustrates the conceptual approach to determining graduate attributes during curriculum development. Understanding the fundamental ideas, including work/task competencies, a list of careers relevant to the discipline, a list of potential employers and new developing trends after graduation, can help curriculum developers achieve this. Additionally, it is critical for the HEP or department to comprehend how effective graduates are in advancing their careers and professional growth, regardless of whether they go on to earn a higher degree or seek employment.

78. The HEP need to ensure that information about students' career and further study options is made available to students upon the completion of the programme. Student's academic handbook is one of the examples which can be in the form of an official brochure or made available on the HEP's website.

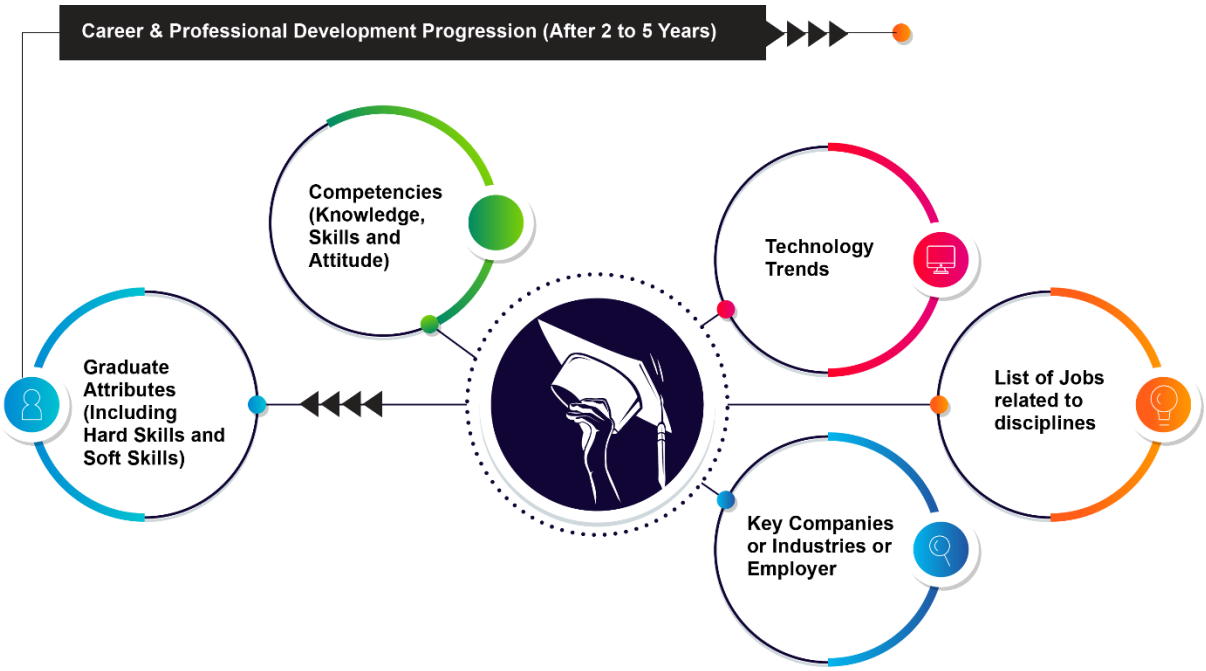

Figure 2.8: Conceptual approach to determining graduate attributes during curriculum development.

Section 3

Programme Development: Process, Content, Structure and Teaching-Learning Methods

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3.1 Overview

1. Programme development requires an appropriate process to meet stakeholders' needs and ensure the programme design with its content, structure, teaching-learning method and assessment meets standard quality.

2. This section provides some guidelines for good practices on the process, content, structure, and teaching and learning method that suit the standard and best practices.

3.2 Programme Level Autonomy

Related COPPA Standard:

1.2.1 The department **must** have sufficient autonomy to design the curriculum and to utilise the allocated resources necessary for its implementation. (*Where applicable, the above provision must also cover collaborative programmes and programmes conducted in collaboration with or from, other HEPs in accordance with national policies.*)

Related COPPA:ODL Standard:

1.2.1 The department **must** have sufficient autonomy to design the curriculum and to utilise the allocated resources necessary for its implementation. (*Where applicable, the above provision must also cover collaborative programmes and programmes conducted in collaboration with or from, other HEPs in accordance with national policies.*)

Related COPTPA Standard:

1.3.4 TVET Providers **must** have the autonomy to design the curriculum and to utilise the allocated resources necessary for its implementation as per the occupational/ industry standards requirements.

3. The department needs to have sufficient autonomy to design the curriculum and utilise the allocated resources necessary for its implementation. Autonomy is seen from three perspectives, which are:

   i. The institution or HEP [the institution is expected to have sufficient autonomy over academic matters. Internal documents of the institution (such as the policy on collaborative programmes) should spell out the way in which institutional autonomy is maintained. Legal binding contracts between collaborative HEPs (for collaborative programmes) should highlight the roles and responsibilities of each institution];

   ii. The department that develops the programme (the same documents may specify the role of the academic division in the design and delivery of programmes if the institution has such a division);

   iii. The staff involved in the design and delivery of the programme (individuals must be given sufficient autonomy in the design and delivery of the programme and focus on areas of individual expertise. Individuals who deliver the courses need to be given sufficient autonomy in the grading and allocation of marks subject to the policy of the institution).

3.2.1 Specific Considerations for Technical and Vocational Education and Training Programmes

4. For effective implementation of a TVET programme, TVET providers need to have autonomy, which enables them to fulfil the occupational/industrial standards and requirements as stipulated by COPTPA. The level of autonomy may be different depending on the hierarchical level of the unit or department or the staff within the institution, as described in paragraph 3(i) – (ii).

3.3 Curriculum Development Process

Related COPPA Standard:

1.2.2 The department **must** have an appropriate process to develop the curriculum leading to the approval by the highest academic authority in the HEP. (*This standard must be read together with Standard 1.1.2 in Area 1 and 6.1.6 in Area 6.*)

Related COPPA:ODL Standard:

1.2.2 The department **must** have an appropriate process to design and develop the curriculum leading to the approval by the highest academic authority in the HEP.

Related COPTPA Standards:

1.3.5 TVET Providers **must** have an appropriate process to develop the curriculum leading to the approval by the related TVET authority.

5. A formal curriculum is defined as a series of planned events that are intended to have educational outcomes. It plans a sequence in which the content of a particular

programme is delivered, whether through conventional or non-conventional modes and the books and materials that are to be used. It also lays down the educational objectives and learning outcomes of the programme.

6. A curriculum can be designed either for a whole programme or a particular unit of study (described as a subject, module or course as the usage in individual cases dictates) in a programme.

7. The availability of staff and the institution's physical and financial resources to support the programme must be considered when planning a programme. The institution must ensure sufficient resources are available in proportion to the student population and needs of the programme and to ensure sustainable execution.

8. The designed programme needs formal approval from the highest academic authority in the HEP. The HEP must set out its own process to obtain the approval of programmes taking into consideration existing MQA and MOHE requirements.

9. Whilst it is not possible to capture the variations in the processes, Figure 3.1 shows a typical hierarchy of academic authority in a learning institution for the purpose of the curriculum approval process.

Figure 3.1: Typical Internal Academic Authority and Process.

3.3.1 Curriculum Committee

10. A formal process of curriculum design involves a curriculum committee consisting of representatives that may include the academic and administrative staff of the HEP, government agencies, professional bodies, industries and other stakeholders.

11. The primary role of the committee is to design and prepare the curriculum and relevant programme documents.

12. The committee should be familiar with the regulations for programme structures and admission requirements connected with the discipline or field of study set by the MQA and other relevant regulators.

13. Where a programme is designed to obtain professional recognition, the HEP is encouraged to have a representative from such a body at the design stage.

14. HEPs that acquire programmes from external institutions or professional bodies may not have control over the design of the curriculum. However, the HEP needs to ensure that the curriculum development processes are met.

3.3.2 Curriculum Development Process

15. The curriculum development of an academic programme may follow the following process:

    Step 1: Perform a stakeholders' needs analysis.

    Step 2: Study the requirements of the discipline.

    Step 3: Formulate PEOs, PLOs and CLOs.

    Step 4: Plan for the appropriate learning and teaching method (more detail in Section 3.6).

    Step 5: Plan for co-curricular activities.

    Step 6: Plan for a curriculum structure (composition and sequence) and delivery strategies.

Step 1: Perform a stakeholders' needs analysis (see Section 3.4 for further details)

i. The purpose of stakeholders' needs analysis is to align the curriculum with market supply and demand; professional, occupational or industry requirements and best practices; as well as issues and trends at the regional, national and international levels.

ii. A more detailed discussion of the stakeholder needs analysis can be found in Section 3.4.

Step 2: Study the requirements of the programme (see Section 3.5 for further details)

i. A more detailed study of the requirements of the programme follows the stakeholder needs analysis.

ii. The main purpose of the study is to determine the graduate characteristics and competencies.

iii. Competency refers to the ability to perform a task successfully using a set of knowledge, skills, and attitudes (also referred to as the KSA domains).

iv. Graduate characteristics and competencies could be determined from Programme Standards or/and Occupational/Industry Standards and Practices (OISP) developed by professional bodies, as well as related agencies and departments. The standards list the Body of Knowledge (BoK), skills and required attitudes in detail.

v. Programme developers could also perform job and task analysis to determine graduate competencies. This is particularly important for profession/TVET based programmes to stay relevant with competencies required in a particular profession. Refer to "*Garis Panduan Reka Bentuk dan Penyampaian*

Kurikulum TVET" published by the Department of Higher Education (Jabatan Pendidikan Tinggi, JPT) in 2021 for further information.

vi. The competencies form the basis of the programme's curriculum structure consisting of categories of modules, i.e., compulsory HEP modules and discipline core modules with their minimum credit requirement.

vii. Programme standard highlights the credit assignment for each of the modules and the minimum total graduating credit of a particular field at a particular level. Table 3.1 shows an example from COPTPA Second Edition, 2020.

Table 3.1: An example of Qualification Level, Curriculum Structure and Minimum Credit.

Qualification Level	Curriculum Structure		Minimum Credit
Bachelor's Degree Level 6	Compulsory Modules	MPU/Core Abilities/Social Skills and Values + Provider's Modules	8
	Discipline Core Modules	50% of which must be practical oriented including Final Project	80
	Industrial Training	6 months	12
	Subtotal Credit		100
	Minimum Total Graduating Credit*		120
	*To complete the minimum graduation credit requirement, the remaining credits can be from any of the categories above.		

Step 3: Formulate PEOs, PLOs and CLOs

i. As discussed in Section 2, the definition of PEO, PLO and CLO are as follows:

- Programme educational objective (PEO) – A statement to describe the educational purpose of the offering of the programme in the form of expected careers or capabilities of the profession.
- Programme learning outcome (PLO) – Desired ability or abilities needed to meet the PEOs, including abilities to apply knowledge, skills and attitudes.
- Course learning outcome (CLO) – Desired ability or abilities needed to meet the PLOs (Note: Listing all course outcomes is too lengthy to represent a programme. Hence, CLOs are more conveniently mapped to the PLOs instead).

ii. How to write an educational objective (PEO) statement?

- Step 1 – Write a condition (e.g., "*The educational objective is to produce graduates after 5 years of graduation…*").

- Step 2 – Write the expectation to match the career (e.g., *"… pursue career in 'XXX' profession*") OR the expected graduate capabilities (e.g., *"… will demonstrate technical competency and leadership to become professional 'XXX' …*").
- Step 3 – Write the criterion for success indicating the scope or level of the attainment of the objectives in terms of career achievement (e.g., "*… at a senior level position*") OR (e.g., "*… leading to a successful career*").

iii. How to write a learning outcome statement?

- Step 1 — Write a condition (e.g., "*After completing a programme/course/ lesson, a graduate/student should be able to …*")
- Step 2 — Write a specific and measurable action verb based on the original or revised version of Bloom's families of cognitive, psychomotor and affective (CPA) taxonomy domains, e.g., "*…investigate…*". These taxonomies are commonly referred to as Bloom's, Simpson's and Krathwohl's taxonomies, respectively and their selection should be based as the Body of Knowledge (BoK), skills and attitudes to be measured for the particular learning outcomes. Alternatively, if the learning outcome is related to certain competency that is written based on the desired knowledge, skills, attitude (KSA) domain as required by the programme standards or the occupational standards, the selected KSA domain should match the required competency from the referred standards.
- Step 3 — Write the subject matter related to the CPA or KSA domain, whichever appropriate (e.g., "*… complex engineering problem …*")
- Step 4 — Write the criterion for success indicating the scope or level of the attainment of the learning outcomes (e.g., "*… using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions*.")

iv. Follow the principle of SMART objectives and learning outcomes, and check whether they are specific, measurable, achievable, relevant, and time-bound (SMART). Document in detail how they are measured, their relevancy to stakeholders needs, and the target time to achieve them.

- How to ensure that the objectives and outcomes are 'measurable'?
  - Use action verbs so learners' achievement can be directly observed from written, verbal and non-verbal communication. Avoid abstract verbs that cannot be directly measured such as 'understand', 'appreciate', 'know about', 'become familiar with', 'learn about', and 'become aware'.
- How to ensure that the objectives and outcomes are 'achievable'?
  - One aspect to be considered is by considering prerequisites to learn new knowledge, skills, and attitudes. This can be achieved by producing a sequence of learning progression by linking the

learning outcomes (i.e., student attributes or competencies) between courses.

- How to ensure that the objectives and outcomes are 'relevant'?
    - The objectives and outcomes should be relevant if they could be mapped 'justifiably' to the stakeholders needs as the following:
        - Map the PEOs to the HEP's vision and mission and educational objectives, and ensure the PEOs support the vision and mission. Programme developers may also map the PEOs to other national and global agenda.
        - Map the PLOs to the PEOs, the PLOs listed in the programme standard as well as the MQF learning outcome domains and clusters.
        - Map the CLOs to the PLOs.
        - Map the lesson outcomes to the CLOs.
- The best practice is to have a one-to-one mapping between a lower-level item and a higher-level item (e.g., CLO is a lower-level item with respect to PLO) and avoid mapping one lower-level item to many higher-level items. This is so that the lower-level item has direct relevance/correlation to the higher-level item, hence easier to measure the attainment of the higher-level item (e.g., PLO) based on the attainment of the lower-level item (e.g., CLO) and consequently make necessary action and improvement.

Step 4: Plan an appropriate teaching-learning method.

i. Planning for the appropriate teaching-learning method should follow the principles of constructive alignment. In constructive alignment, teachers must take great care in making the assessment and delivery (teaching and learning) explicitly conform to the teacher's intention to ensure learning takes place. A more detailed discussion of the appropriate teaching-learning method can be found in Section 3.6.

ii. The planning for the appropriate teaching-learning method should include the planning for its Student Learning Time (SLT) based on the credit values of a course. SLT should be based on the statements on academic load according to MQF Second Edition as shown in Box 3.1.

iii. The purpose of the planning is to ensure the number of learning activities is worth the credits assigned to a course while at the same time, not overburdening the students and disturbing other course activities.

Box 3.1: MQF Second Edition's statements on academic load

Malaysian Qualifications Framework Second Edition (Para 66.i, ii, iii.):

i. The MQA Act 2007 defines a credit as 'a representative measure to reflect the academic load'. Within the MQF (2007), 'credit is a quantitative measure that represents the volume of learning or academic load to attain the set of learning outcomes.' It is a measure of the total academic/learning load or volume of learning a student must undertake to achieve a defined group of learning outcomes.

ii. In this aspect, 'academic load' is a quantitative measure of all the learning activities required to achieve a defined set of learning outcomes: lectures, tutorial, seminar, practical, clinical practice, self-study, retrieval of information, studio work, research, field work, WBL as well as preparing and sitting for an examination.

iii. The Malaysian credit value is 1 credit equivalent to 40 Notional Learning Hours (NLHs). This took into consideration the semester system and assumption of availability of learning hours of average students, various learning activities, guided or independent learning and non-face to face learning.

iv. Student learning time can consist of guided learning, independent learning as well as assessment activities:

- Guided learning is structured learning with a set of outcomes and delivery methods set by an instructor. Activities considered in Guided Learning include:
  a) Face-to-face activities, such as lectures, tutorials and practical sessions.
  b) Non-face-to-face activities, such as online learning.
  c) Blended learning and others, such as project-based learning, discovery learning, practicum, industrial training, and others.
- Independent learning is non-structured learning but related to the outcomes, delivery, and assessment of a course, voluntarily conducted by students for preparation of the guided learning activities, revision of past lessons and for other purposes.

v. The planning should begin with the estimation of semesterly and weekly SLT hours based on the total number of credits of a module/course. The planning should consider the MOHE semester system policy (see Box 3.2).

Box 3.2: MOHE's policy on semester system

JKPT's Policy Compilation 2009-2020 MQA Section 1: Curriculum Design and Development, Item 85 Semester System:

1. *1 study year = maximum 43 weeks.*
2. *Maximum number of session/semester in a study year is 3 semesters.*
3. *Maximum study load for a student in a study year is 50 credits.*
4. *The maximum credit for a semester is 20 credits*.*
5. *Student intake session is based on the number of session/semester in a year.*
6. *The minimum programme period is based on MOHE policy. If there is no policy for a particular level of qualification, the minimum programme period is based on Student Learning Time (SLT).*

**except for foundation and master's courses.*

**Note: The calculation of 20 credits maximum per semester is based on an SLT calculation of a 17-week study in one (1) semester. The maximum credit will be less if the HEP uses a semester system that is less than 17 study weeks.*

vi. The number of credits for a module/course can be determined from the programme standard, or based on the level of importance and difficulty, stakeholders' input and benchmarking exercises. A typical long semester has 17 weeks, comprising 14 learning weeks, one study week and two exam weeks, with a maximum credit of 20 credits. A 3-credit hour module/course would have:

In a semester : 3 credits × 40 hours / 1 semester = 120 hours
In a week : 3 credits × 40 hours / 17 weeks ≃ 7 hours

vii. A programme can set up its own principle to estimate SLT based on any best practices that is suitable to the field and discipline. For example, the SLT can be estimated based on the guide in Table 3.2. Activities other than lecture, tutorial, lab or practical can be estimated based on its requirements and implementation. For example, for student-centred learning activities such as problem-based learning, the programme can allocate 1 hour to 2 hours of independent learning per hour of guided learning depending on the complexity of the problem given.

Table 3.2: Example of Delivery and Assessment SLT estimation guide.

Activity	Estimated Student Learning Time*	
	Guided Learning Time	Proposed Independent Learning Time (ILT) for Guided Learning Activities
Lecture	1 hour	1 - 2 hours / Lecture Hour
Tutorial	1 hour	1 - 2 hours / Tutorial Hour
Laboratory or practical	1 hour	0 - 2 hours / Practical Hour
Online Learning (Synchronous, Asynchronous)	1 hour	1 - 2 hours / Online Activity

Activity	Estimated Student Learning Time*	
	Assessment	Independent Learning Time (ILT) for Assessment Activity
Examination (Mid Term, Final etc) Tutorial	1 hour *	3 - 5 hours / exam hour*
Continuous (Coursework/ Assignment)	1 - 2 hours per page or 400 words count*	

*Depending on the weightage of the CLO, level of difficulties and assessment type.

viii. Courses with online implementation can further refer to a detailed guide on SLT estimation for online courses in JPT's Online Teaching and Learning Playbook.

ix. Work-based learning (WBL) courses can consider the effective learning time (ELT) of the students at their workplace to be between 50% and 80% of the delivery of the theory, industrial guidance (IG) and workplace assessment as shown in the example below. A detailed guide on WBL can be found in MQA's GGP: Work-Based Learning.

- ELT = (Theory + Industrial Guidance + Assessment) × (50% to 80%)
  - **Example 1:** Industrial Automation Course (50 hours' worth 1 credit)
    ELT = (150 hours) × 80% = 120 hours (i.e., 3 credits)
  - **Example 2:** Industrial Training Course (80 hours' worth 1 credit)
    ELT = (80 hours) × 50% = 40 hours (i.e., 1 credit)

Step 5: Plan Co-Curricular Activities

i. A more detailed discussion of the planning for co-curricular activities can be found in Section 3.7.

Step 6: Plan a Curriculum Structure and Delivery

i. At this stage, a list of compulsory HEP modules and discipline core modules should have been identified to form the basis of the curriculum structure.

ii. The curriculum is the sum of all planned learning experiences in a learning institution. In outcome-based education, the learning outcomes will drive the design of the curriculum.

iii. The planned learning experience can be packaged into modules or courses.

iv. A curriculum structure is the way in which the courses are organised (i.e., concurrent and sequential arrangement of courses) and composed (i.e., composition of core courses and elective courses).

v. The composition of compulsory HEP modules and core modules needs to be considered according to the minimum requirement of the programme standard.

vi. The programme developer can plan in a manner so that the curriculum is more flexible to meet current needs by maximising the credit for the elective components. Elective components could be part of the percentage of compulsory modules or the discipline core modules.

vii. Curriculum developers can consider the organisation and composition of the fundamental and applied courses/modules in the curriculum structure as shown in Figure 3.2. Various strategies can be used, such as arranging fundamental components first, followed by applied components. Other alternatives include arranging them concurrently to let learners have a more hands-on experience. Electives are commonly part of applied courses, and they can also be part of complementary knowledge and skills to produce a holistic graduate.

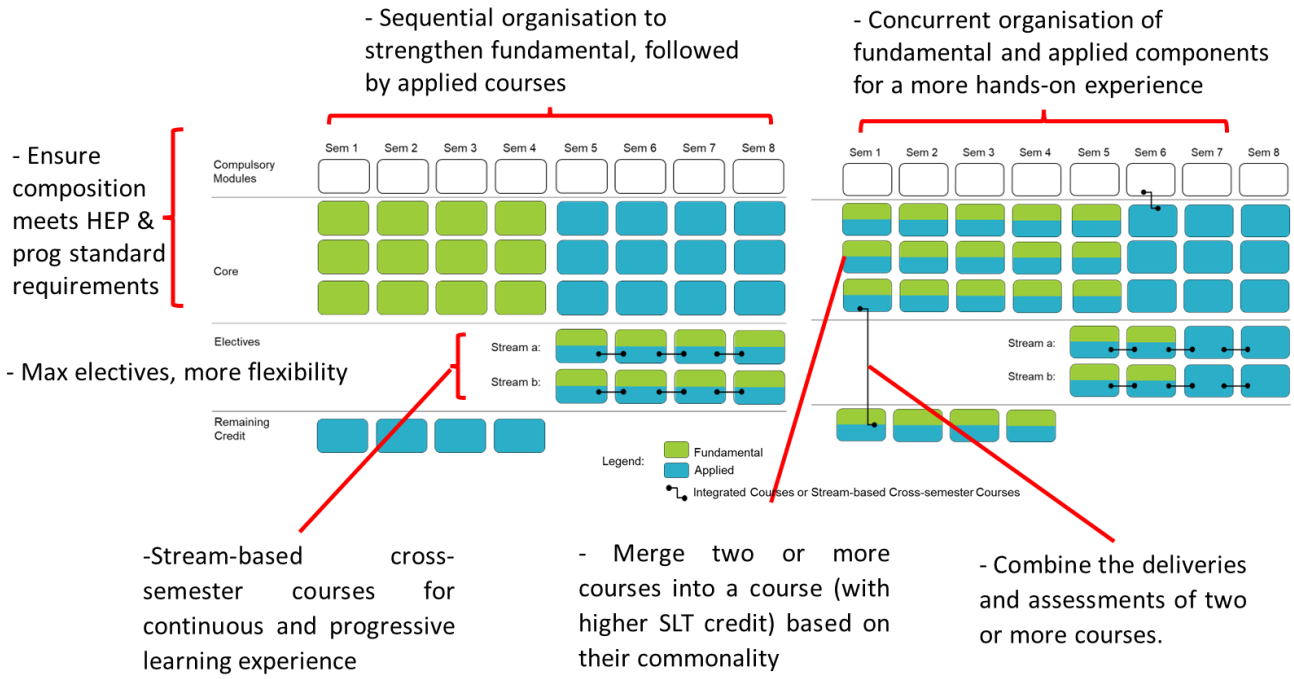


Figure 3.2: Examples of various strategies to organise a curriculum.

viii. The relation between modules or courses needs to be considered, whether they need to be offered sequentially as one is a prerequisite to the other, or they can be arranged concurrently to support the implementation strategy.

ix. Integrated courses in Figure 3.2 refer to the cohesive and interconnected curriculum that incorporates various disciplines or subject areas. It emphasises the integration of knowledge, skills, and concepts from different fields of study rather than teaching subjects in isolation. This can be done by determining how different subject areas can be interconnected and finding meaningful ways to integrate them. For example, the Engineering Design course can be integrated with the Project Management course by:

   i. Combining the deliveries and assessments of both courses in a design project activity.
   ii. Merging the courses into one course with a higher SLT credit.

x. Stream-based cross-semester courses as highlighted in Figure 3.2 are courses that are designed to span multiple semesters or academic terms, allowing students to engage in a continuous and progressive learning experience. In stream-based courses, the curriculum is divided into different streams or modules, each building upon the knowledge and skills acquired in the previous stream. For example, a programme might have elective streams for students to choose from, whereby each stream focuses on a specialised work competency, i.e., to be a scientist or a technologist.

xi. Curriculum developers can also consider the optimisation of resources (the staff and learning facility schedules) when arranging the modules and courses.

3.4 Stakeholders' Needs Assessment in Curriculum Development

Related COPPA Standard:

1.2.3 The department **must** consult the stakeholders in the development of the curriculum including educational experts as appropriate. (This standard must be read together with Standard 7.1.4 in Area 7.)

Related COPPA:ODL Standard:

1.2.3 The department **must** consult the stakeholders in the development of the curriculum including education and ODL experts.

Related COPTPA Standards:

1.3.6 TVET Providers **must** consult the stakeholders in the development of the curriculum.

16. Stakeholders are individuals or groups that have an interest in any decision or activity of the curriculum development process.

17. Stakeholders include employers, professional bodies, agencies that represent national interest, students (or potential students), alumni and education experts.

18. Consultation of the stakeholders is made for the purpose of aligning the curriculum with market supply and demand, professional requirements and professional or industry best practices, as well as issues and trends at the regional, national, and international levels.

19. Primary data from stakeholder's consultation can be gathered using qualitative methodologies such as interviews and focus group discussions. This is sometimes followed by a quantitative methodology such as using surveys to get feedback from a larger audience. Secondary data that is published by relevant sources including the Department of Statistics, relevant ministries and agencies, as well as local and international institutions should also be used.

20. Relevant sources of information may include:

    i. Alumni surveys;
    ii. Tracer studies;
    iii. Exit surveys;
    iv. Employer surveys;
    v. Future trends;
    vi. External examiner/assessor reports;
    vii. National needs – government blueprints;
    viii. International experts;
    ix. Student performance data;
    x. Programme standards and guidelines.

21. Different types of needs assessments and analysis should be conducted including market supply and demand analysis as well as issues and trends at regional, national and international levels.

3.4.1 Specific Considerations for ODL Programmes

22. For ODL programmes, in addition to industrial stakeholders, educational and/or subject-matter experts, the consulted stakeholders should include ODL experts with experience in delivering and assessing ODL courses, as well as designing and managing ODL curricula and programmes.

3.5 Discipline Requirements and Good Practices in the Field

Related COPPA Standard:

1.2.4 The curriculum **must** fulfil the requirements of the discipline of study, taking into account the appropriate programme standards, professional and industry requirements as well as good practices in the field.

Related COPPA:ODL Standard:

1.2.4 The curriculum **must** fulfil the requirements of the discipline of study, taking into account the appropriate programme standards, professional and industry requirements, good practices as well as future needs in the field.

Related COPTPA Standards:

1.3.1 The TVET programme **must** be considered only if occupational/industry standards are used as a basis for curriculum development.

1.3.2 The curriculum **must** fulfil the requirements of particular occupational/industry standards and practices and where applicable, professional and industry requirements as well as good practices in the new, emerging field of technology.

23. The curriculum needs to fulfil the requirements of the discipline of study by considering the appropriate programme standards, professional and industry requirements as well as good practices in the field as stipulated in COPPA, COPPA:ODL and COPTPA.

3.5.1 Discipline Requirements and Programme Standards

24. Discipline is defined as a branch of learning or scholarly instruction. The commonly accepted criterion of a discipline is the BoK. The requirement of the discipline mainly refers to matching the body of knowledge of the discipline. The BoK can be found by referring to programme standards and/or occupational and industrial standards and practices.

25. Programme standards are developed by panel members in consultation with various public and private HEPs, relevant government and statutory agencies, professional bodies, related industries and students. These standards, if followed closely and wisely, enable the development and sustenance of quality programmes in Malaysia, subsequently improving the quality of graduates and their employability and mobility. The programme standards contents are consolidated into seven COPPA/COPPA:ODL/ COPTPA areas, namely:

i. Programme Development and Delivery;
ii. Assessment of Student Learning;
iii. Student Selection and Support Services;
iv. Academic/Teaching Staff;
v. Educational Resources;
vi. Programme Management; and
vii. Programme Monitoring, Review and Continual Quality Improvement.

26. Programme Standards provide a guideline on the minimum levels of acceptable practices in designing and offering programmes at the tertiary and post-secondary levels prescribed in the MQF based on different modes of study. They also provide specific requirements on the body of knowledge of various core areas and address the importance of aligning programmes with the direction of the Sustainable Development Goals (SDG) and Industrial Revolutions.

27. The programme standard document should be read together with other quality assurance documents and policies issued by MQA and other related agencies which include, (but are not limited to) the following:

a) Malaysian Qualifications Framework (MQF), Second Edition, 2017;
b) Code of Practice for Programme Accreditation (COPPA), Second Edition, 2017;
c) Code of Practice for Programme Accreditation: Open and Distance Learning, Second Edition, 2019 — for ODL programmes;
d) Code of Practice for TVET Programme Accreditation (COPTPA), Second Edition, 2020 — for TVET programmes;
e) Code of Practice for Institutional Audit (COPIA);
f) Guide on Compliance Evaluation for Self-Accreditation Universities, 2020 — for self-accreditation institutions only;
g) Standards: Master's and Doctoral Degree (SMDD), Second Edition, 2021 — for postgraduate programmes;
h) Relevant industry/occupational standards; and
i) Relevant guidelines to good practices (GGPs).

28. Programme areas that do not have a programme standard may refer to the nearest programme standard of broader or similar fields, professional conduct and practice, and industry requirements. Occupational standard can also be referred to as it is a list of competencies consisting of the required knowledge, skills and attitudes for a certain occupation/profession.

3.5.2 Good Practices in the Field

29. The curriculum should include good practices in the field. These are practices that increase the efficiency or effectiveness of a certain process.

30. Good practices are adaptable across industries. For example, in the manufacturing field, good manufacturing practices (GMPs) recommend that standard operating procedures (SOPs) are created, enforced and validated. Having SOPs means work processes can be improved over time. In another example in the information technology field, Information Technology Infrastructure Library (ITIL) is a set of detailed practices for IT activities, such as IT Service Management (ITSM) and IT Asset Management (ITAM) that focus on aligning IT services with the needs of the business.

31. Some of the good practices can be referred to in the programme standard, although a bit limited, since the main purpose of a standard is to list the minimum requirements. More information on the good practices can be found from benchmark activities with other programmes and industrial practices, from the latest publications by learned and professional societies, as well as from publications by local and global organisations.

3.5.3 Good Practices in Programme Development

32. Good practices may be gathered in the areas related to the design and development of the programme itself. Programme developers should consider looking into current and latest trends and issues, as well as value-adding features, in the curriculum design and development through effective mechanisms like benchmarking.

33. In guiding programme developers, MQA has published several GGPs based on selected areas in COPPA, as well as certain areas of interest, such as guidelines on WBL, Accreditation of Prior Experiential Learning (APEL), Massive Open Online Courses (MOOCs) and Micro-credentials (MCs). These documents can be found and are downloadable through the following link:

    https://www2.mqa.gov.my/qad/v2/ggpnew.cfm

34. One of the popular guidelines issued by the MQA is about Work-Based Learning (WBL). WBL combines academic learning and real-world learning applications in the workplace. It refers specifically to the achievement of 'planned learning outcomes' derived from the experience of performing a work role or function. Thus, WBL hopes to enhance the student learning experience by expanding industry collaboration in the design and delivery of programmes, increasing the use of experiential and service learning to develop 21st century skills and leveraging technology-enabled models to enable more personalised learning to meet the objectives of holistic, talented, and balanced graduates.

35. In the advent of digital transformation, WBL can also be done virtually (online or remotely). Such arrangement could provide benefits such as access to global opportunities, flexible hours and optimize resources. Virtual internship for example, can be conducted in work settings where normal employees are allowed to work remotely using suitable technology, if there is appropriate work environment, work culture and quality mentoring that support the arrangement.

36. Experience in an active and constructive manner can improve the desired attributes, especially self-confidence, innovation and creativity, professionalism, and graduate communication skills. In addition, functional skills of graduates such as critical thinking, problem solving, teamwork, social skills, emotional intelligence, and negotiation skills can be improved. Figure 3.3 provides an insight into different generic models associated with WBL and their typical attributes.

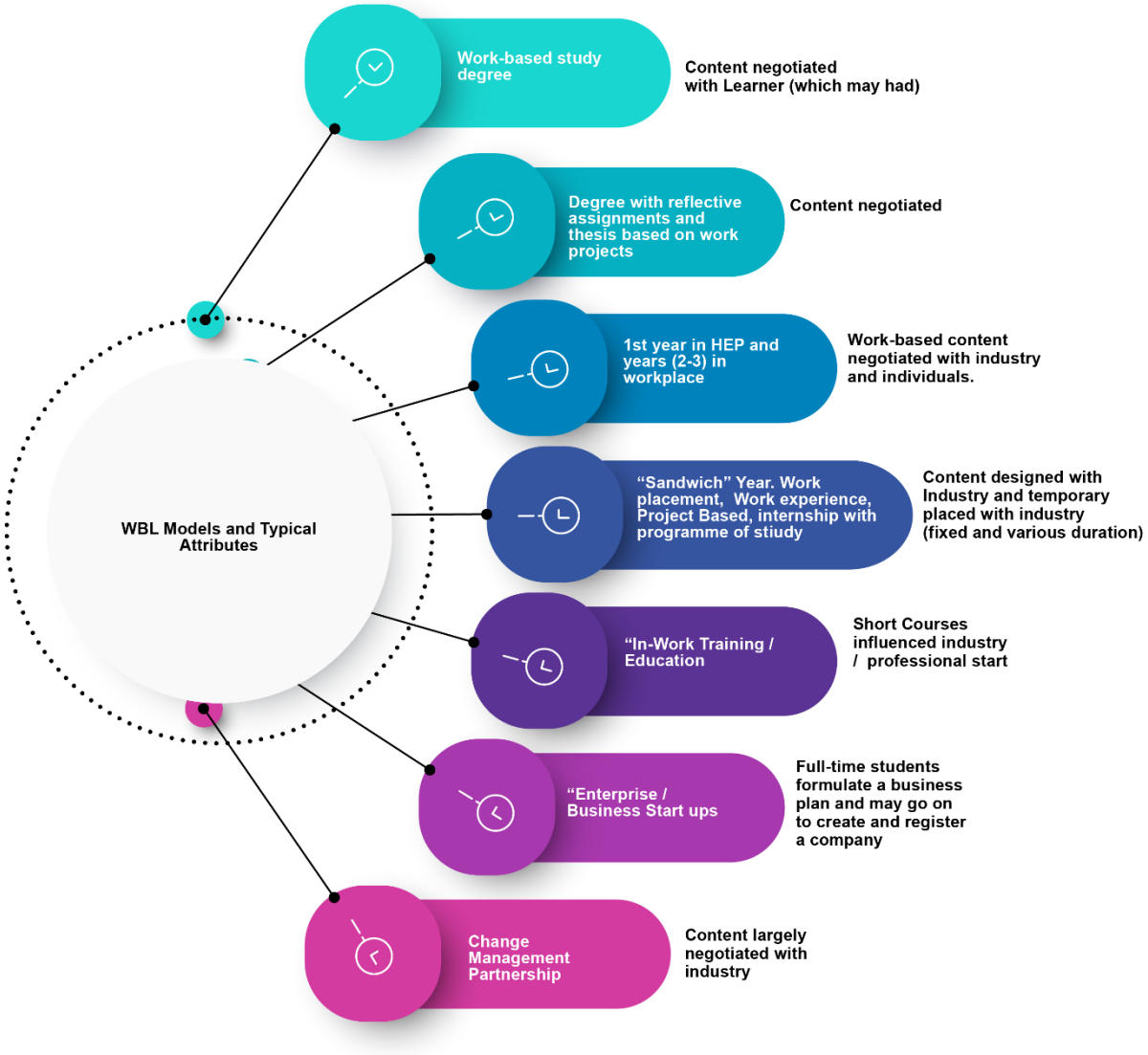


Figure 3.3: WBL models and typical attributes.

37. In addition to MQA's documents, the curriculum developers may also refer to a following collection of related documents and guidelines published by the Department of Higher Education (JPT), MOHE which address good practices in programme development:

i. Experiential Learning and Competency-Based Education Landscape (EXCEL);
ii. *Garis Panduan Rekabentuk dan Penyampaian Kurikulum TVET* (Guidelines on Curriculum Design and Delivery in TVET);
iii. Guideline to Good Practices for Bachelor's Degree Apprenticeship Implementation;
iv. High-Tech High-Value (HTHV) Programme Development Framework;
v. A Report on Digitalization of Teaching and Learning in Higher Education: A Reality Check;
vi. Transdisciplinary Makerspace;
vii. Alternative Assessment in Higher Education;
viii. Service-Learning Malaysia;
ix. High Impact Educational Practices (HIEPs);
x. *Garis Panduan Perlaksanaan Pembelajaran Teradun Gantian (Pembelajaran Dalam Talian)*; and
xi. MOHE Guide to Entrepreneurship Integrated Education.

38. Some digital copies of JPT's documents and guidelines can be found through the following link: https://jpt.mohe.gov.my/portal/index.php/ms/penerbitan and highlights on some of the documents and guidelines can be found in APPENDIX 3.

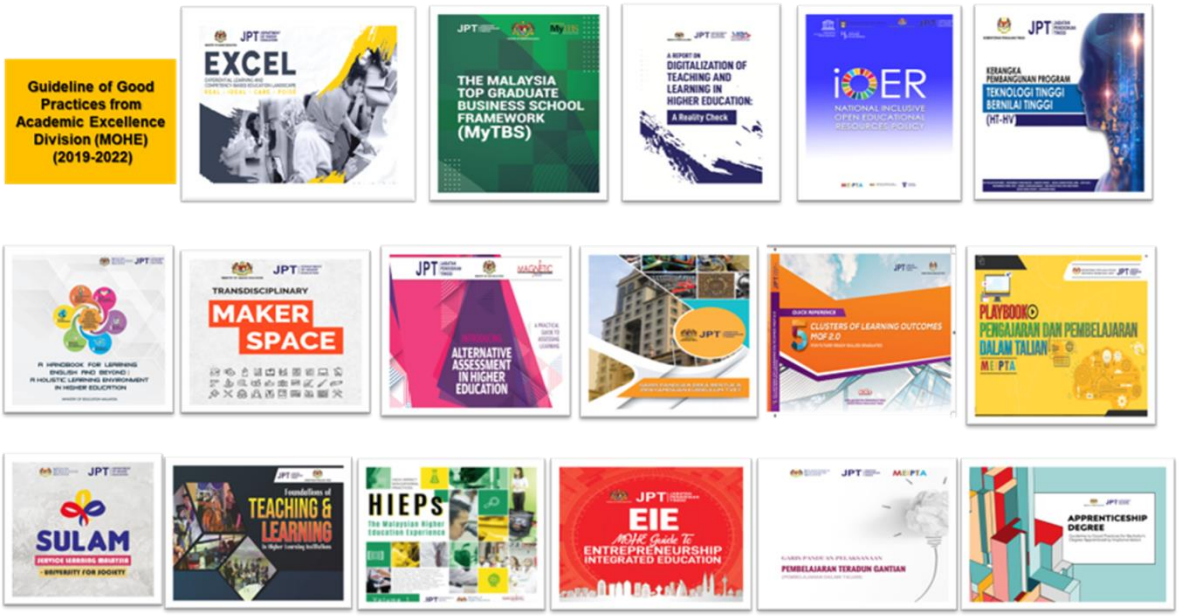


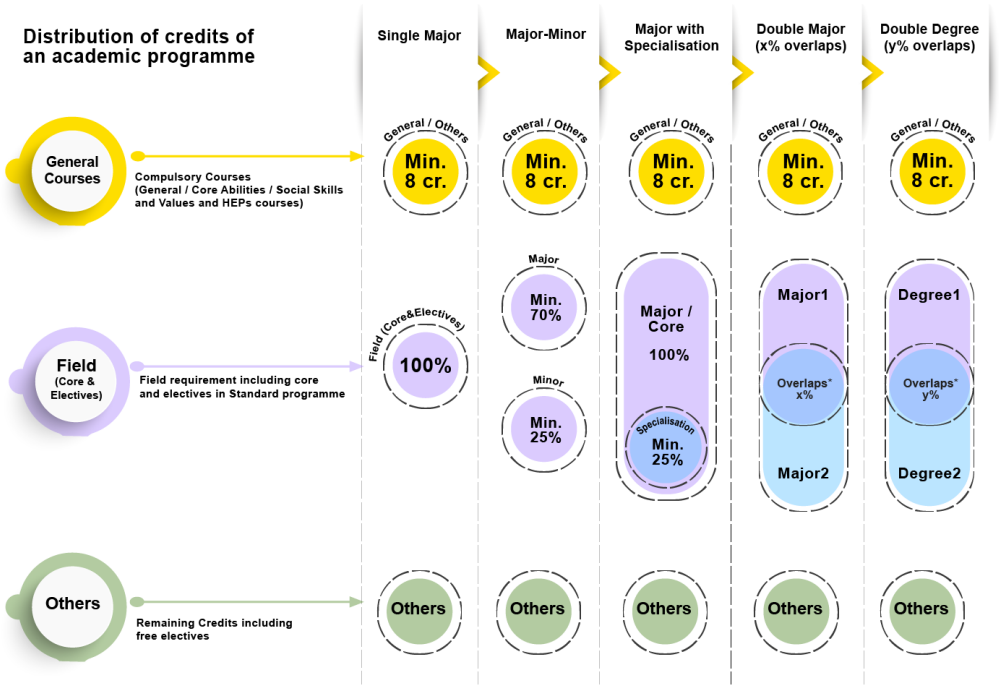
Figure 3.4: Examples of documents and guidelines published by the Department of Higher Education, MOHE.

39. MQA, together with JPT, supports all forms of collaborations between programme degrees within and beyond borders to extend students' learning experience, introduce Malaysian higher education to others, share expertise and develop collaboration in other spheres. Programme developers may consider programmes of study in collaboration with one or two institutions in the development and programme offer which lead to the awarding of degrees. The differences between Joint Degree, Dual Degree, and Double Degree are explained in Table 3.3.

Table 3.3: Joint Degree, Dual Degree, and Double Degree Definition.

	Joint Degree	Dual Degree	Double Degree
Number of Academic Programmes	One Programme	Two Programmes	Two Programmes
Number of degree granting Institution	Two or more institution	Two or more institutions	Same or two different institution
Field of Study	Not Applicable	Same or Similar Field	Different Fields
Degree Awarded	One Degree and One Scroll	Two Scroll by institutions involved	Two Scroll by institutions involved
Naming of the programme	Based on the naming of the new program / current program that goes through the conversion agreed by the institution concerned	Based on the designation of existing programs that have received full accreditation	Based on the designation of existing programs that have received full accreditation
Minimum Period of Study	Meet the minimum duration of the MQF level	Meet the minimum duration of the MQF level	Meet the minimum period of MQF level with an additional period of study to fulfill part of the second study followed
Curriculum Structure	Developed jointly	Determined by both institutions jointly	Meet the minimum period of MQF level with an additional period of study to fulfill part of the second study followed

40. Figure 3.5 illustrates how the credit is distributed in different type of programme structure including those of collaborative programmes. The field requirement shows different percentages of overlapping credits between different majors and specialisations. Note that electives are part of the percentage of general studies, fields and other courses. For major with specialisation, specialisation can be part of core courses or electives. For double major programmes, electives can come from both Major 1, Major 2 and their overlapping courses. The overlapping courses in double major and double degree programmes can include components in general courses. The percentage of overlapping courses depends on the similarity between courses in both field of study. The Guidelines on Nomenclature of Malaysian Higher Education Programme provides the principles for naming a programme, including those with various structures as shown in the example in the Figure 3.5.



(a)

Programme Type	Single Major	Major with Specialisation	Major-Minor	Double Major (same field)	Double Major (different fields)	Double Degree
Example	Bachelor in Business Administration	Bachelor in Business (Entrepreneurship)	Bachelor in Marketing with Information Technology	Bachelor in Marketing and Human Resource Management	Bachelor in Management and Information Technology	Bachelor in Management / Bachelor in Information Technology
General Course	8	8	8	8	8	8
Field 1 (Field Core 1)	36	36	36	36	36	36
Field 1 (Common Core)	42	42	42	42	42	42
Field 1 (Specialisation)		26				
Field 1 (Field Core 2)				36		
Field 2 (Field Core)			26		81	81
Electives and remaining credits	34	14	10	0	0	0
Total	120	126	122	122	167	167

(b)

Figure 3.5: (a) Distribution of credits of academic programmes with (b) working examples based on Programme Standards: Business Studies (2021 Edition) and Programme Standards: Computing (2015 Edition).

3.5.4 Specific Considerations for Technical and Vocational Education and Training Programmes

41. For TVET programmes, the TVET curriculum needs to fulfil the requirements of the occupational/industrial standards that are related to the field of study since the graduate will need to be skilful and competent to perform the given tasks as soon as they enter into employment and join an industry workforce relevant to their field. In keeping abreast with current development and technological technologies in the field, certain courses covering these aspects and relevant good practices in the field should be considered to be included in the curriculum.

3.6 Teaching and Learning Methods

Related COPPA Standard:

1.2.5 There **must** be an appropriate teaching and learning methods relevant to the programme educational objectives and learning outcomes.

Related COPPA:ODL Standard:

1.2.5 There **must** be appropriate teaching and learning methods relevant to the programme educational objectives and learning outcomes which covers the following:

i. The department **must** establish a mechanism/system where all forms of interaction and delivery are integrated.
ii. The programme **must** involve the provision of appropriate self-instructional materials (SIM) for self-directed learners.
iii. There **must** be a unit or section devoted to the design and development of SIM.
iv. SIM for the ODL programme **must** be provided in the following ways: adopting existing materials; adapting existing materials; or creating original materials or any other appropriate approaches. The department should consider having intellectual property rights and licensing policies for learning materials, learning objects and innovations. Copyright laws and best practices must be in place and observed.
v. The department **must** provide an electronic/online learning platform to conduct teaching and learning activities.
vi. The department **must** decide on the nature of interaction between learners and instructors* which may be synchronous or asynchronous or a combination of both. Some of the interaction **must** be carried out through face-to-face sessions which can be physically or electronically mediated communication.

Related COPTPA Standard:

1.3.1 The TVET programme must be considered only if occupational/industry standards are used as a basis for curriculum development.

42. The teaching method refers to the broader techniques or strategies used for classroom instruction to help students achieve learning outcomes. Meanwhile, the learning activity is the activity done by the student during the learning process when the teaching method

is implemented. The purpose of selecting an appropriate learning and teaching method is to enable students to engage with a facilitator to learn the knowledge and skills to achieve the programme educational objectives and learning outcomes.

43. Learning taxonomies. Programme developers may consider suitable teaching and learning methods based on the taxonomy of learning types. Scholars characterised and classify types of learning differently. Among the widely used taxonomy is Bloom's cognitive, psychomotor and affective domain taxonomy, as well as the Structure of Observed Learning Outcomes (SOLO) taxonomy. There are others like Webb's Depth of Knowledge Framework, Fink's Taxonomy of Significant Learning, Marzano and Kendall Taxonomy, UbD's Six Facets of Understanding and the *TeachThought* Learning Taxonomy. Programme developer can explore the various taxonomy of learning types before deciding on the most suitable for the programme or individual course. APPENDIX 4 further elaborates on some of the learning taxonomies.

44. A learning and teaching activity enables students to engage with a facilitator to learn the knowledge and skills to achieve the learning outcomes. Choosing the appropriate delivery method will bring instruction to life while encouraging students to actively engage with content and develop their knowledge and skills (refer to APPENDIX 5).

3.6.1 Constructive Alignment in Curriculum Design

45. A constructive alignment is an approach to curriculum design where all aspects of teaching and assessment are tuned to support and encourage a higher-order learning process. The key to the constructive alignment principle is that the components in the teaching system, especially the teaching methods used and the assessment tasks, are aligned with the learning activities assumed in the intended outcomes.

46. According to Biggs (2003), constructive alignment has two aspects. Constructive aspects refer to the idea that students construct meaning through relevant learning activities. It is something learners have to create for themselves. The alignment aspects refer to what the teacher does, which is to set up a learning environment that supports the learning activities appropriate to achieving the desired learning outcomes.

47. Bigg's framework of constructive alignment is represented in Figure 3.6, which involves the following processes:

    i. Identify the intended learning outcomes;
    ii. Design assessment tasks to measure the attainment of the learning outcomes;
    iii. Plan learning activities to enable students to develop the skills, knowledge and understanding described in the intended learning outcomes and measured by assessments; and
    iv. Choose the content (topics/examples/resources/materials) required to support the learning activities.

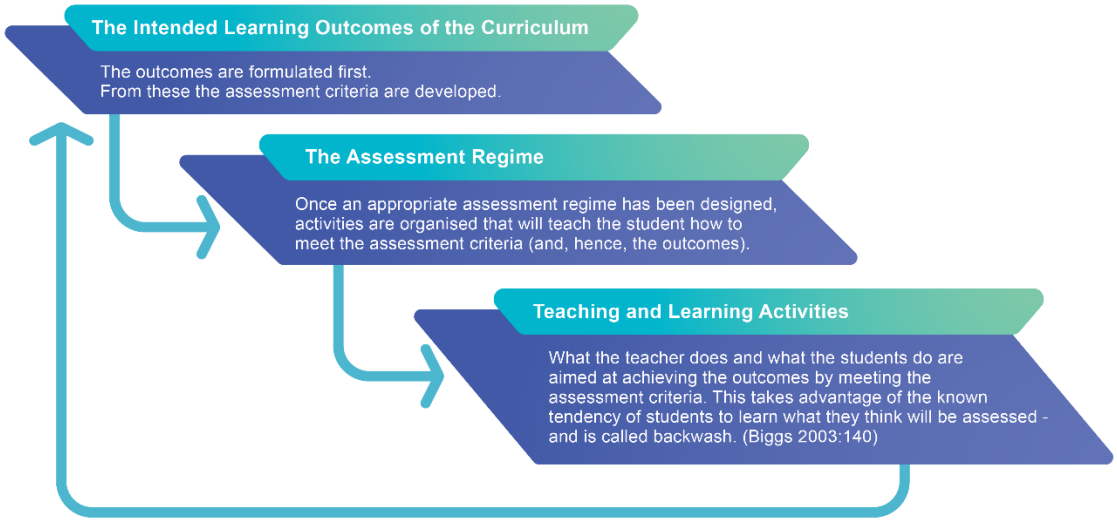


Figure 3.6: Bigg's constructive alignment framework.

48. The constructive alignment process involves the following elements as illustrated in Figure 3.7, that need to be aligned with and mapped to accordingly:

    i. A targeted MQF learning outcome cluster (LOC) or subcluster;
    ii. A PLO, that is mapped to the MQF LOC in (i);
    iii. A CLO, that is mapped to the PLO in (ii);
    iv. Formative and summative assessment items, that are mapped to the CLO in (iii);
    v. Learning activities, that are mapped to match the assessment items in (iv);
    vi. Weightage of summative assessments, that are determined to loosely correlate to the amount of learning and assessment activities in (v) and (iv); and
    vii. SLT of the combined assessment and learning activities is determined to verify the weightage in (vi).

Figure 3.7: Alignment of learning and teaching elements.

49. The programme developer should identify the learning and teaching methods that will properly support a particular learning outcome. Its effectiveness depends on constructive alignment. The weightage and SLT for both the delivery and assessment should reflect the emphasis of the CLO. If the CLO is important and difficult to learn, more percentage is given to the total marks, and more time is allocated for the delivery. Figure 3.8 shows examples of a constructive alignment table in documenting the mapping process.

Field of study : Social Science
Programme : Tourism
Course : Product Innovation in Tourism and Hospitality

Course Learning Outcome (CLO)	MQF LO Cluster	Delivery Method	Assessment Method	Specific Task	SLT
CLO1 - Identify the concepts and practice on product innovation in tourism and hospitality industry	1	Cases study	Quiz: 5% Final exam: 10%	Students are given a case on tourism and hospitality industry to identify the concepts and practice on product innovation	18 hours
CLO2 – Apply innovation principles in tourism and hospitality industry product innovation task	2	Project	Assignment: 20%	Students are given a task to propose new product for tourism and hospitality given a certain context.	24 hours

Figure 3.8: Example of a constructive alignment table.

3.6.2 Teaching and Learning Methods in Hybrid and Virtual Environment

50. Teaching methods for a virtual learning environment are much different from classroom instructions. These methods demand more independence for students to be able to learn at least some of the materials when instructors are not available. These methods attract a larger share of out-of-region and non-traditional students, including working students, parents and military personnel. Instructors must prioritise learning objectives before technology in their instructional planning, including synchronous and asynchronous instructions. Programme developers may consider the use of technology tools for learning and teaching, such as:

    i. Digital learning platforms
    ii. Collaborative interactive applications
    iii. Learning Management Systems (LMS)

51. There are many ways of encouraging appropriate learning activities other than face-to-face, such as blended, hybrid and online learning. The term ‘blended’ refers to mostly face-to-face learning that also incorporates a few class sessions’ worth of online instruction. The technology is used to facilitate activities, the delivery of content and/or students assessments. Meanwhile, ‘hybrid’ refers to when online and face-to-face instructions are integrated, with a substantial amount of seat time in the traditional classroom substituted with internet-based activities. It may or may not include face-to-face orientation or proctored examination(s).

52. In blended learning (see Figure 3.9), asynchronous learning that is commonly facilitated by media, such as e-mail and discussion boards, supports work relations among learners and teachers, even when participants cannot be online at the same time. It is, thus, a key component of flexible e-learning. Synchronous learning, commonly supported by media like videoconferencing and chat, has the potential to support students in the

development of learning communities. Learners and teachers experience synchronous learning as more social and avoid frustration by asking and answering questions in real-time.

53. Programme developers may also implement substitute blended learning (SBL) to ensure an online learning pedagogy immersed in teaching deliveries and assessment methods. SBL is an approach that combines online learning mode and face-to-face mode in the range of 30% – 80% of the SLT. The formula for the three elements is 40:40:20. 40% for learning materials, 40% for learning activities and 20% for learning assessments. These three elements have direct relationships with the learning outcomes of the related course (refer to Table 3.5).

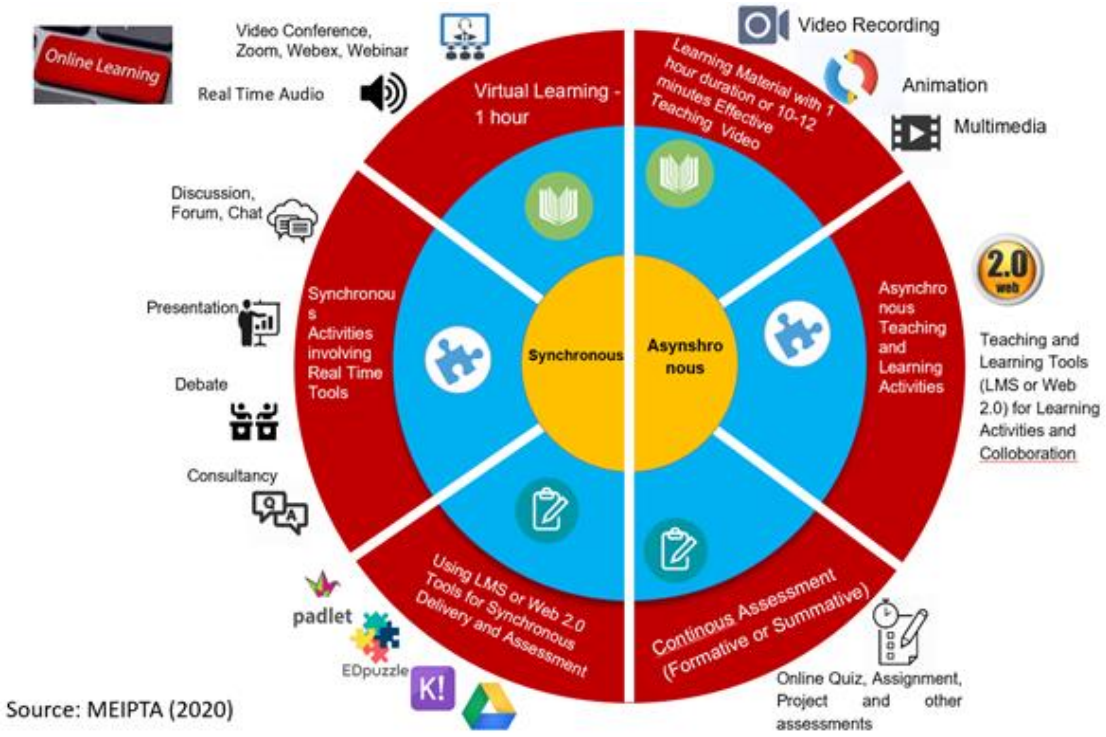


Figure 3.9: Blended learning framework.

Table 3.5: Elements of substitute blended learning (SBL).

Elements	Percentage Ratio	Detailed Information
Learning Materials	40%	Use of learning materials: • Video & Audio & Screen recording • Presentation in the form of narration • Animation and web2.0 software • Simulation or Virtual Reality, or broad reality or Combined Reality • Lecture in or out of class • Interactive Content • Internship Video and Lab
Teaching Activities	40%	Implementation of online activities using Web 2.0 tools or other methods: • Kahoot • Padlet

		• LMS (e.g., forum, chatting, etc.) • and others that are appropriate
Assessment	20%	Online assessment: • Quiz • Test • Examination • Assignment • Reflection • and others that are appropriate
The specified weights (40%, 40%, 20%) for the three elements can be modified with percentages or other measurement methods that are appropriate for the needs of the respective HEPs and it needs to be accompanied by a clear, measurable justification and get confirmation from the respective HEP governors.		

54. The simulation of SLT in online learning, covering teaching and learning materials, teaching and learning activities, and assessments in SBL is demonstrated in Table 3.6.

Table 3.6: Simulation of SLT for substitute blended learning.
[Source: *Garis Panduan Pembelajaran Teradun Gantian (Pembelajaran dalam Talian)*, MOHE]

Syllabus		Student Learning Time (Conventional)						Student Learning Time (Online Learning)		
Week	Chapter	Lecture	Tutorial	Lab	Self-Learning		Assessment	TnL Material	TnL Activities	Assessment
					Guided	Non-Guided				
1	Introduction to Problem Solving				2	2				
2	Introduction to Programming	2		2	2	1				
3	Identifier, Variable Assignment					1		4	2	8
4	Input & Output Statements					1		2	2	
5	Operator & Expression					2		3	2	
6	Control Statements Test 1	2			2	3	2			
7	Control Statements	2		2	2	1				
8	Arrays					1		3	4	
9	Arrays Mini Project					2	6	2	4	
10	Modular Programming	2		2	2	1				
11	Modular Programming	2		2	2	1				
12	Pointer	2		2	2	1				
13	File Processing Test 2	2			2	3	2			
14	Mini Project Presentation					1	1			
15	Final Exam					9	3			
	Total	14	0	10	16	30	14	14	14	8
		SLT for Conventional Learning					84	SLT for Online Learning		36
		Overall SLT						120		

55. Programme developers may also explore new forms of teaching, learning and assessment for an interactive world and productive innovation. From a list of pedagogical innovations reported in the literature, it can be summarised into ten new innovative pedagogies as below (refer to Innovating Pedagogy 2022 Report):

i. Hybrid models;
ii. Dual learning scenarios;
iii. Pedagogies of micro-credentials;
iv. Pedagogy of autonomy;
v. Watch parties;
vi. Influencer-led education;
vii. Pedagogies of the home;
viii. Pedagogy of discomfort;
ix. Wellbeing education; and
x. Walk and talk.

3.6.3 Specific Considerations for Open and Distance Learning, Technical and Vocational Education and Training and Postgraduate Programmes

56. For ODL programmes, the HEP and/or department needs to develop SIMs for all courses delivered through an ODL mode and there should be at least 60% of ODL courses in the curriculum for a programme to be eligible as an ODL programme. In preparation for offering an ODL programme, the HEP needs to establish a special unit at the institutional level to facilitate and coordinate with the department delivering the ODL programme, including the design and development of SIM modules. In addition, the HEP and/or department needs to set up and maintain an online LMS as a virtual platform to deliver the ODL programme.

57. When applying for the Provisional Accreditation (PA) of the ODL programme, the SIM modules for all courses in Semester 1 of the programme need to be completed. Furthermore, the SIM modules for all first-year ODL courses of the programme need to be completed before the commencement of the programme upon obtaining approval from *Jawatankuasa Pendidikan Tinggi* (JKPT). Eventually, the SIM modules of all the ODL courses need to be completed before applying for the Full Accreditation (FA) of the ODL programme.

58. The contents of SIMs should include:

i. Introduction about the course, which may include the course title, course code, course coordinator, core reading materials and student learning time;
ii. Course overview that consists of course synopsis, course learning outcomes, weekly modules/topics and assessment methods;
iii. Self-learning content and activities, including an introduction to the modules, module learning outcomes, module outline, details of modules, activities of modules, self-assessment and reflection activities, a summary of key points and references;
iv. Content of learning materials with title, purpose, summary, related tasks, feedback and time allocation of activity;
v. Discussion platform with title, purpose, summary, tasks, feedback and time allocation of activity; and
vi. Any other contents deemed relevant for an ODL course.

(Disclaimer: the items listed are not exhaustive.)

59. SIMs developed should be learner-friendly and written in a conversational writing style using simple language. It should arouse the interest of learners and be engaging and interactive because it is developed for learner use.

60. The HEP needs to have an electronic learning platform for learning and teaching activities. The electronic learning platform should: (i) have a user-friendly interface and clear instructions for ease of navigation; (ii) be compatible with a wide range of devices for access to learning materials, learning activities and assessments anytime and anywhere; (iii) encourage interaction between learners and instructors via chats, discussion forums and real-time collaborations and discussions; (iv) consist of self-assessment methods for learners to track their progress and performance; (v) be secured and compliant with data protection regulations; and (vi) be supported with maintenance services and software updates.

61. The HEP may have a checklist of SIMs and the LMS to ensure the systematic planning and organisation of ODL courses/programmes. The checklist will outline the contents to be included in SIMs and/or the LMS.

62. For TVET programmes, HEPs can consider teaching and learning methods that support the development of work competencies as stated in the occupational/industrial standard and practices such as work-based learning or other practice and application-oriented approaches.

63. For postgraduate programmes, specifically research-based programmes and the research component in the mixed mode programmes, the teaching and learning activities should include activities to monitor students' progression in research works, supervision activities, as well as semesterly, yearly and final assessments. All these activities and assessments need to be aligned with and planned to achieve the PEOs and PLOs, even in the absence of CLOs.

3.7 Co-Curricular Activities

Related COPPA Standard:

1.2.6 There **must** be co-curricular activities to enrich student experience, and to foster personal development and responsibility. (*This standard may not be applicable to Open and Distance Learning [ODL] programmes and programmes designed for working adult learners.*)

Related COPTPA Standard:

1.3.7 There **must** be activities to enrich student experience and to foster personal development and responsibility. (*This standard may not be applicable to Open and Distance Learning (ODL) programmes and programmes designed for working-adult learners.*)

64. Co-curricular are activities conducted outside the classroom that may or may not form part of the credits. These activities are an extension of the formal learning experiences in a course or academic programme. The purpose of co-curricular activities is to enrich the student experience and foster personal development and responsibility.

65. On the other hand, extracurricular activities may be offered but may not be explicitly connected to academic learning.

66. There are different types of co-curricular activities, which are:

    i. Physical development
    ii. Psychomotor development
    iii. Cultural development
    iv. Intellectual development
    v. Social development
    vi. Leisure-related co-curricular activities

67. There are two types of co-curricular activities as follows:

    i. Co-curricular with credit allocation in General Studies Courses (MPU) under the group designation of MPU-U4 cluster – Society Management Skills. The MPU-U4 cluster includes practical-based engagements and community management skills, such as community services and co-curriculum courses.

    ii. Co-curricular without credits allocation in the form of student activities, which are normally organised and coordinated under specific HEP units in charge of student affairs or clubs, such as entrepreneurship incubators, and any leisure-related co-curricular activities.

3.7.1 Specific Considerations for Postgraduate Programmes

68. For postgraduate programmes, the co-curricular component can be embedded in the curriculum, either explicitly through specific courses or implicitly via certain postgraduate activities or events, as stipulated by the relevant standards SMDD, Second Edition. For a research-based programme, the type of co-curricular component can be in the form of academic activities related to personal development targeted to achieve generic PLOs. On the other hand, for coursework and mixed-mode programmes, this component may be delivered through courses with community engagement projects and/or service learning with aims to achieve certain generic PLOs.

3.8 Continual Quality Improvement in Programme Development

69. A curriculum design cycle should follow the CQI principle as illustrated in Figure 3.10 below. Each cycle consists of planning, implementation, monitoring and reviewing and improvement stages as follows:

    i. During the planning stage, the stakeholders' needs are analysed in order to determine the graduate competencies and learning outcomes, as well as the concerns and areas of improvement from the previous cycle. The curriculum will follow the desired learning outcomes.

    ii. In the implementation stage, learning and teaching take place and an assessment is conducted.

iii. Next, in the monitoring and reviewing stage, the results of the assessment are analysed, and feedback and evaluation of students and faculty members are considered.

iv. In the improvement stage, if the learning outcomes are achieved, the curriculum design, teaching and learning, as well as assessment practices are standardised. Area of improvement is identified and is implemented in the next PDCA cycle.

Figure 3.10: CQI Approach in Curriculum Design and Development.

70. CQI is a management approach for improving and maintaining the quality, which emphasises internally driven and relatively continuous assessments of potential causes of quality defects, followed by actions aimed either at avoiding a decrease in quality or correcting it at an early stage. A constructive alignment is an approach to curriculum design where all aspects of teaching and assessment are tuned to support and encourage higher-order learning processes to support CQI.

Section 4

Programme Delivery

4.1 Overview

1. COPPA, COPPA:ODL and COPTPA standards emphasise on planning for the effective delivery of programmes. Effective delivery of a programme involves monitoring the programme at various levels by the department, sharing information with the relevant stakeholders, having a conducive environment and innovations in teaching, learning and assessment approaches to enhance student learning experiences and contribute to student success, and establishing linkages with relevant stakeholders for students' engagement and potential employability. CQI of the programmes should be embedded in the planning.

4.2 Effective Delivery of Programme

Related COPPA Standard:

1.3.1 The department **must** take responsibility to ensure the effective delivery of programme learning outcomes.

Related COPPA:ODL Standard:

1.3.1 The department **must** take responsibility to ensure the effective delivery of programme learning outcomes.

Related COPTPA Standard:

1.4.1 TVET Providers **must** take responsibility for ensuring the effective delivery of programme learning outcomes.

2. The department should ensure the effective delivery of the PLOs. The department needs to plan the learning and teaching activities and assessment approaches to align with CLOs. This is to ensure that constructive alignment is in place and students' attainment is measured. (Please refer to the relevant components in Section 2: Statement of Educational Objectives of Academic Programme and Learning Outcomes and Section 3: Programme Development: Process, Content, Structure and Teaching-Learning Methods.)

3. The monitoring process should be in place to ensure the effective delivery of the PLOs, which may involve three levels:

i. Programme level;
ii. Department level, which may include or refer to centre, department, institute, school, faculty; and
iii. HEP level.

4. The department should establish a CQI mechanism as shown in Figure 4.1 to identify and resolve the issue(s) of the programme. This can be done by identifying the root cause(s) to improve the structure of the programme, PEOs, PLOs, CLOs and contents; learning and teaching activities and SLT; assessment methods; and corrective actions. The department should ensure all plans are aligned to improve the attainment of the PEOs and the PLOs of the programme. (Refer to Guidelines to Good Practices: Monitoring, Reviewing and Continually Improving Institutional Quality (MR-CIIQ) and any other relevant guidelines.)

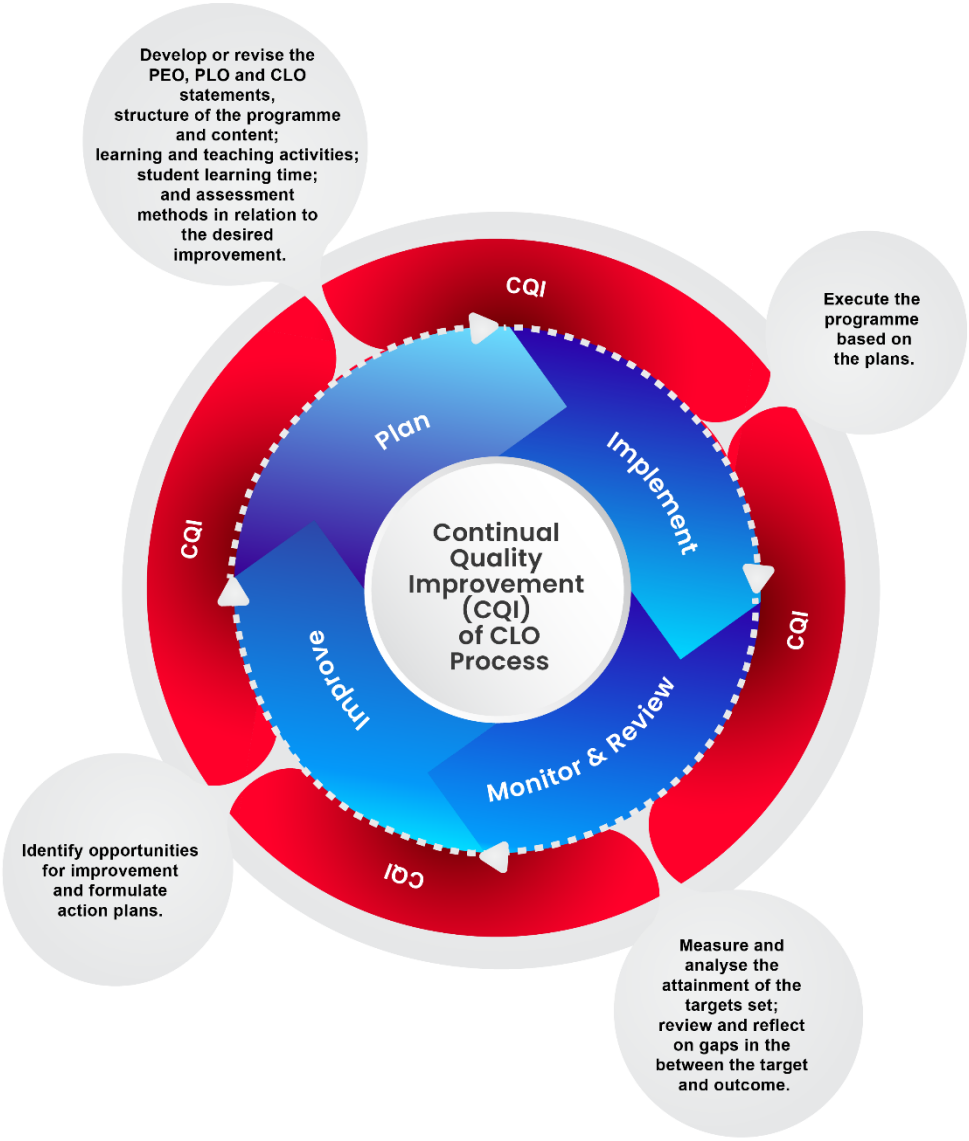


Figure 4.1: Continual quality improvement in programme delivery.

5. All evidence on effective delivery of the programme comprising learning outcomes, contents, learning and teaching activities and SLT; assessment methods; corrective actions; and plan(s) of action and assessment process and/or any revision(s) to the programme delivery need to be kept properly by the department.

4.3 Information about the Programme

Related COPPA Standard:

1.3.2 Students **must** be provided with, and briefed on, current information about (among others) the objectives, structure, outline, schedule, credit value, learning outcomes, and methods of assessment of the programme at the commencement of their studies

Related COPPA:ODL Standard:

1.3.2 Students **must** be provided with, and briefed on, current information about (among others) the objectives, structure, outline, schedule, credit value, learning outcomes, and methods of assessment of the programme at the commencement of their studies. This information can be made available in the learning portal and/or learning management system.

Related COPTPA Standard:

1.4.2 Students **must** be provided with, and briefed on, current information about (among others) the objectives, structure, outline, schedule, credit value, learning outcomes, and methods of assessment of the programme at the commencement of their studies.

6. Based on the COPPA, COPPA:ODL and COPTPA standards related to the programme information to be disseminated to students, the department must ensure that the students be provided with and briefed on current information about the programme at the beginning of their studies.

7. The department should have designated personnel to support the implementation of the programme and related activities as well as to respond to students' inquiries, including information about the programme delivery and other academic matters.

8. The department should provide information about the programme and the courses to students. Besides, the department should also be able to provide information about the attainment of CLOs and the progress of students' studies. All evidence should be kept for the necessary length of time by the department.

4.3.1 Student Handbook or Study Guide

9. A student handbook or study guide, serves as a reference for the programme. Figure 4.2 shows important information about the programme that could be included in the handbook.

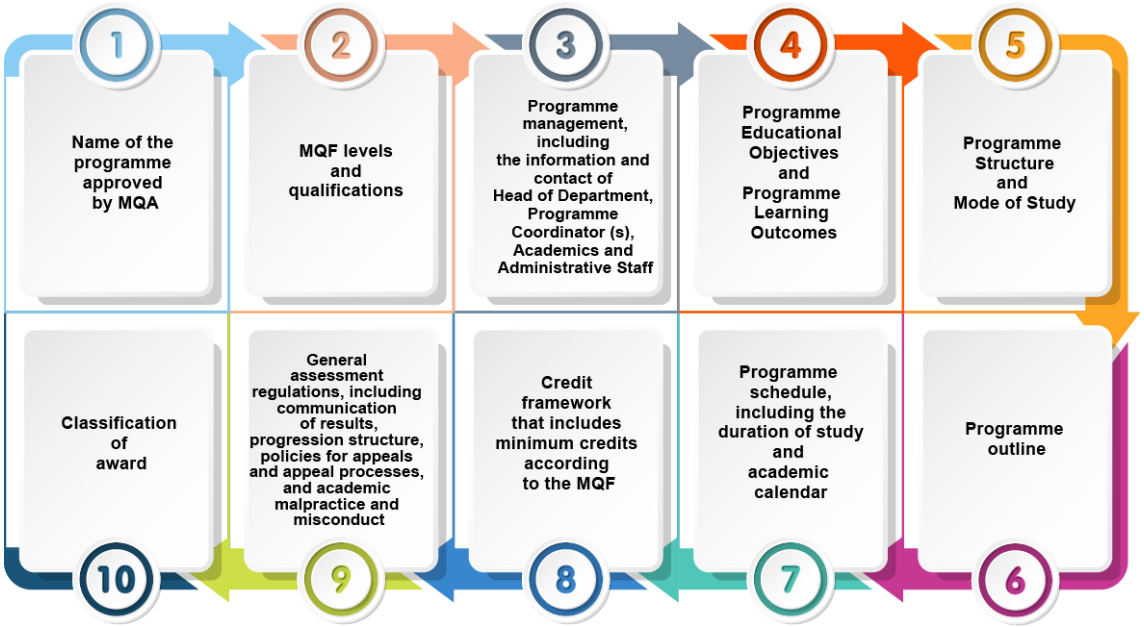


Figure 4.2: The information in the student handbook or study guide.
(Disclaimer: the items listed are not exhaustive.)

10. The student handbook or study guide should be updated regularly, and this document must be made available for students' reference, either in hardcopy or softcopy.

11. A student orientation should be held to provide students with concise and accurate information and to create and enhance students' familiarity with the HEP's regulations and academic standards. This also promotes communication between the HEP and the new students for their academic success. The orientation programme can be held via a virtual platform or physical interaction, whichever is deemed possible.

4.3.2 Course Outline

12. The course outline serves as a guide about the course content and should be made available, either in hardcopy or softcopy, at the beginning of the course. This should include:

    i. Course code and name;
    ii. Course synopsis;
    iii. Name of academic staff;
    iv. Semester and year offered;
    v. Credit value;
    vi. Prerequisite and/or co-requisite;
    vii. Course learning outcomes;
    viii. Mapping of CLOs to PLOs;
    ix. Learning and teaching methodologies;
    x. Methods and criteria of assessment and weightage;
    xi. Assessment submission deadline(s) and the format required (either hardcopy and/or electronic or any other format specified);

xii. Transferrable skills;
xiii. Weekly course topics, activities and/or learning resources;
xiv. Student learning time;
xv. References; and
xvi. Other special requirements for the course, if any.
(Disclaimer: the items listed are not exhaustive.)

13. The course outline should be updated regularly, and this document must be made available for students' reference, either in hardcopy or softcopy.

4.3.3 Specific Consideration for Open and Distance Learning Courses/ Programmes

14. For ODL courses/programmes, academic staff and academic support staff should explain the expectations for the ODL programme to students. This includes the nature of the delivery of the programme, the minimum technical requirements to access the LMS, SIMs, schedule for the delivery of the courses/programme, learning materials, learning activities and engagement, assessment of students' work, learning resources available, information on the support services and any contingency plan(s) in the event that the design of the ODL mode of delivery has failed.

4.4 Programme Leadership

Related COPPA Standard:

1.3.3 The programme **must** have an appropriate full-time coordinator and a team of academic staff (e.g., a programme committee) with adequate authority for the effective delivery of the programme. *(This standard must be read together with related Programme Standards and Guidelines to Good Practices, and with Standards 6.1.1 and 6.2.2 in Area 6)*

Related COPPA:ODL Standard:

1.3.3 The programme **must** have a full-time programme leader/coordinator and a team of course coordinators and/or instructors with adequate authority for the effective delivery of the programme. *(This standard must be read together with related Programme Standards and Guidelines to Good Practices, and with Standards 6.1.1 and 6.2.2 in Area 6)*

Related COPTPA Standard:

1.4.3 The programme **must** have an appropriate full-time coordinator and a team of TVET staff (e.g., a programme committee) with adequate authority for the effective delivery of the programme.

15. It is crucial that the HEP provides clear guidelines and directions to ensure appropriate leadership, teaching excellence and good scholarship in learning and teaching. Sufficient autonomy should also be granted to the department for the implementation of the programme and related activities in line with the national aspiration, policies and strategies.

16. At the departmental level, it is crucial to have collective leadership to:

    i. Provide clear directions, strategies and guidelines;
    ii. Build relationships amongst the different constituents based on collegiality and transparency;
    iii. Manage resources with accountability;
    iv. Forge partnerships with stakeholders in educational delivery; and/or
    v. Promote teaching excellence and scholarship of learning and teaching.

17. The department should have an appropriate full-time programme leader and a team of academic staff to assist governance that reflects the collective leadership of the HEP and programme.

18. An appropriate programme leader is necessary for the success and sustainability of a programme. The programme leader should have passion, determination, creativity and dynamism, and be able to work with a team of academic staff and an administration/support team in managing the programme effectively.

19. The criteria for the selection of a programme leader and the responsibilities should be made clear and transparent. (Refer to the respective programme standards for selection of a qualified programme leader.)

20. Programme leader should engage in the tasks shown in Figure 4.3, with the support of the team of academic staff.

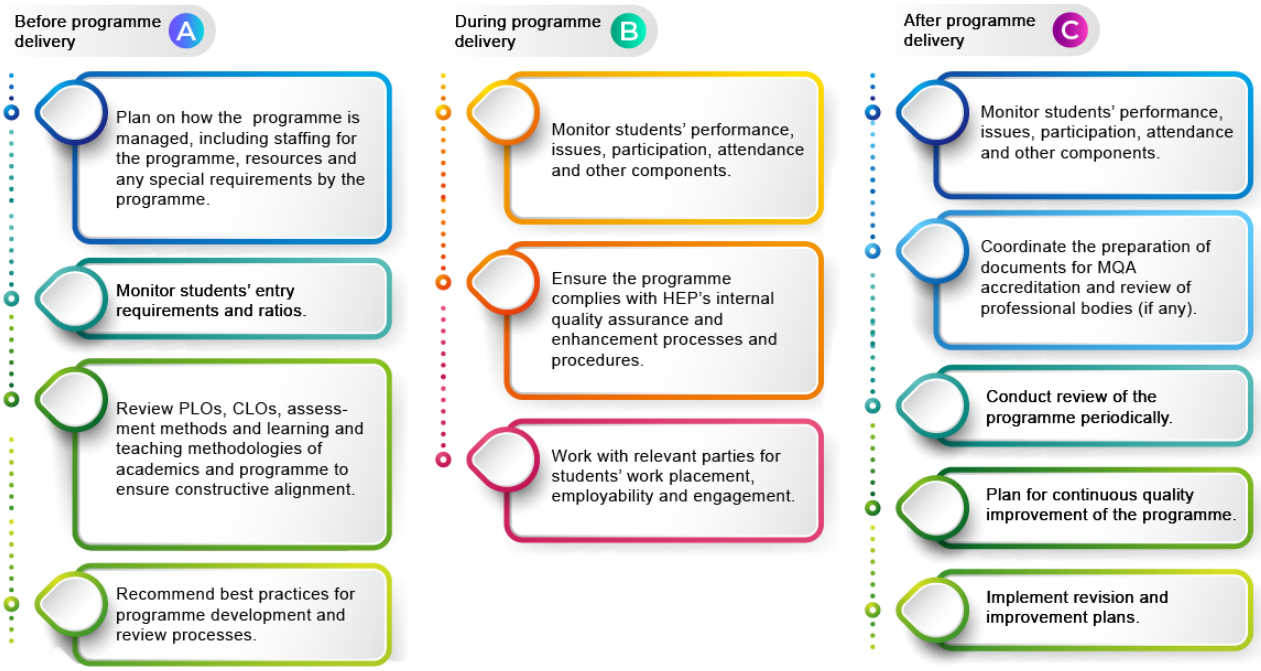


Figure 4.3: Example of tasks of a Programme Leader.
(Disclaimer: This list of tasks is not exhaustive)

21. Where necessary, a course coordinator may be appointed together with a team of course instructors to manage certain types of courses, such as project-based courses or courses containing many inter- and cross-discipline modules which require a variety of

expertise to teach or course with a large student number that needs to be separated into smaller classes.

22. Qualified administration/support staff should be made available to support the implementation of the programme and related activities.

23. Proper training should be provided to equip the programme leader, the team of academic staff and the administration/support team with knowledge and skills and competencies to support the implementation of the programme.

4.5 Conducive Learning Environment

Related COPPA Standard:

1.3.4 The department **must** provide students with a conducive learning environment. *(This standard must be read together with Standard 5.1.1 in Area 5)*

Related COPPA:ODL Standard:

1.3.4 The department **must** provide students with a conducive learning environment and proper facilities for the execution of practical based training in line with the requirement of the programme. *(This standard must be read together with Standard 5.1.1 in Area 5)*

Related COPTPA Standard:

1.4.4 TVET Providers **must** provide students with a conducive learning and training environment. (*This standard must be read together with standard 5.1 in '5.0 Educational Resources'*)

24. A conducive learning environment provided by the department includes the provision of learning space(s) that is/are physical and/or virtual to support conventional, blended, hybrid, online, flexible or open and distance learning delivery. This includes environments to support relevant learning and teaching activities and research activities.

25. In the case of physical learning environments, a conducive environment should include the following items to support optimal delivery (and where applicable):

    i. Physical learning space(s);
    ii. Furniture and furnishing (e.g., colours, ergonomically designed furniture);
    iii. Audio visual equipment, IT hardware and software, and public address (PA) and sound system;
    iv. Writing and projection surfaces;
    v. Specialised facilities (e.g., multimedia studios, laboratories, equipment and machines); and/or
    vi. Others, if any.

    (Refer to the related programme standard for the relevant equipment required by the programme.)

26. In the case of virtual learning environments, a conducive environment should include the following considerations to support optimal delivery, and the department/HEP may provide some assistance to support students' learning needs:

i. Hardware (e.g., computer, notebook, tablet and drawing device);
ii. Software (e.g., licensed video conference software and tools, applications software, social media, Wi-Fi and applications);
iii. LMS, virtual learning platforms, cloud storage and facilities, social media platforms; and
iv. Others, if any.

(Refer to the related programme standard for the relevant equipment required by the programme.)

27. The library or resource centre, physical or virtual, should have adequate and up-to-date reference materials and online repositories for various academic programmes and research purposes. The library or resource centre needs to comply with the relevant laws and regulations.

28. The setting up of the environment and equipment should comply with the relevant safety laws and regulations. Standard operating procedures should be developed to ensure the safe running of the equipment and experiment(s), if any. The environment and equipment should be maintained periodically with proper record-keeping.

29. A conducive environment on campus should include a favourable surrounding or an environment that gives a positive feeling to the students. This includes the provision of proper facilities for practical-based training, depending on the requirements of the programme. For specialised programmes or ODL and TVET programmes, creating a conducive learning environment may be crucial to enable students to attain the learning outcomes of the programme.

4.5.1 Specific Considerations for Open and Distance Learning Programmes

30. For ODL programmes, the department should have quality SIMs for students to support their learning needs. These should contribute to the attainment of the learning outcomes within the context of constructive alignment. These materials should be made available to students.

31. The HEP should also have an effective LMS. This serves as a centralised learning platform where students could access various learning materials (such as course contents, video recordings, reading materials and others) and engage in learning activities, assessments and engagement activities effectively. The LMS can also provide valuable insights to academic staff into learners' behaviour, progress and performance which information can be used to improve the quality of the ODL course/programme. (Refer to the relevant components in Section 3: Programme Development: Process, Content, Structure and Teaching-Learning Methods)

4.6 Innovations in Teaching, Learning and Assessment

Related COPPA Standard:
1.3.5 The department **must** encourage innovations in teaching, learning and assessment.

Related COPPA:ODL Standard:
1.3.5 The department **must** encourage innovations in teaching, learning and assessment and include tools (i.e., analytics) to monitor student learning activities.

Related COPTPA Standard:
1.4.5 TVET Providers **must** encourage innovation in TVET delivery and assessment such as work-based learning, problem-based learning, blended learning, online learning, apprenticeship, project work, and others.
1.4.7 TVET Providers must always engage with industries to enhance TVET delivery.

32. Academic staff are encouraged to engage in innovations in teaching, learning and assessment in line with national initiatives and global trends to enhance the learning performance of students.

33. The department should develop and implement policies, procedures and frameworks to support the implementation of innovative teaching, learning and assessment practices to improve students' learning performance. The department should work hand-in-hand with the HEP to provide relevant resources to encourage innovation in teaching, learning and assessment.

34. To support the above, the department and/or HEP could establish a unit that focuses on producing quality teaching, learning and assessment skills among the academic staff. Among others, the unit will:

    i. Create a dynamic learning environment that students will enjoy and benefit from;
    ii. Embed learning analytics to ensure student success; and
    iii. Provide training to academic staff to become trained educators.

35. There should be accessibility to adequate infrastructure for the implementation of good and innovative practices. This may include the provision of personal devices, support for data plans, and provision of licensed software and social media applications.

36. New academic staff should undergo an onboarding programme as early as possible as part of a readiness programme. The department should also promote innovative practices in teaching, learning and assessment to new academic staff.

37. Academic staff should embark on continuing professional development (CPD) programmes where a minimum number of CPD points is to be achieved annually.

38. The performance measurement of academic staff should include education, research, and service as core interrelated academic activities. It is recognised that the degree of engagement of academics in these areas varies among the HEP.

39. The HEP should ensure a fair and equitable distribution of work. There should be a robust and open system of proper recognition and reward that acknowledges and appreciates excellence, especially for the purpose of promotion, salary determination and other incentives.

40. The HEP and department should encourage and embrace the use of Generative Artificial Intelligence (AI) tools for teaching, learning and assessment practices. The HEP and department should also develop guidelines about the use of Generative AI tools in an ethical and responsible way.

41. Strategic guidelines are to be published or shared among the HEP, department and academic staff.

4.6.1 Promoting Culture of Innovation in Teaching, Learning and Assessment

42. It is vital to promote a culture of innovation in teaching, learning and assessment. Hence, the following initiatives are recommended:

    i. Gain feedback from students, such as using student satisfaction survey and/or learning experiences to gain feedback on their learning journey.
    ii. Use of other feedback channels among peers and other stakeholders including self-reflection.
    iii. Analyse student attainment and review/take the relevant corrective action for CQI.
    iv. Govern the teaching, learning and assessment practices through a Quality Assurance/Enhancement Office, Learning and Teaching Committee, and events or activities to share good practices.
    v. Establish a Community of Practice (COP) to enculturate good and innovative practices.
    vi. Support and recognise the Scholarship of Teaching and Learning (SoTL) activities amongst academic staff, such as sharing best practices, coaching others or participating in conferences, competitions, exhibitions and other initiatives.
    vii. Recognise and award academic staff for good and innovative practices through teaching and learning events.
    viii. Encourage academic staff with innovative teaching, learning and assessment practices to apply for the national/international teaching award.

4.6.2 Specific Considerations for Open and Distance Learning Programmes

43. For ODL programmes, it is recommended that each HEP have the following items to perform their tasks. This may include:

    i. A design and development studio where academic staff can get support to create educational resources; or
    ii. A design and development team (e.g., may consist of instructional design and technology specialists, multimedia designers and video editors) from whom academic staff may seek advice or services.

44. HEP should have ODL and educational experts, ODL consultants and/or ODL advisers for HEP and academic staff to seek advice on ODL practices.

45. Academic staff and academic support staff (new and existing full-time/part-time) who are engaged in the delivery of ODL courses should undergo training in ODL teaching,

learning and assessment approaches. This includes training associated with technologies and pedagogies.

4.7 Stakeholders' Role in Programme Delivery Improvement

Related COPPA Standard:
1.3.6 The department **must** obtain feedback from stakeholders to improve the delivery of the programme outcomes.

Related COPPA:ODL Standard:
1.3.6 The department **must** obtain feedback from stakeholders to improve the delivery of the programme outcomes.

Related COPTPA Standard:
1.4.6 TVET Providers **must** obtain feedback from the stakeholders to improve the delivery of the programme outcomes.

46. The HEP should have policies, procedures and mechanisms for regular review and update of their structures, functions, strategies and core activities to ensure CQI.

47. The department should have systematic quality assurance (QA) functions to handle the QA issues and should work hand-in-hand with the HEP's QA unit in executing the policies/procedures of periodic monitoring, the review process, timeline and programme delivery feedback from stakeholders. (This section should be read together with Area 7 of COPPA, COPPA:ODL and COPTPA: Programme Monitoring, Review and Continual Quality Improvement.)

48. The department should establish assessment instruments and mechanisms to assess the graduates' capabilities and employability, regularly monitoring and reviewing the programme to ensure its currency and relevance.

49. Programme delivery approaches would be more effective when the methods of delivery of the curriculum and programme structure are kept abreast with the most current developments in its field of study.

50. Information on the programme has to be updated and available to all students and related parties. Thus, feedback and input from related stakeholders through continuous consultation should be obtained for the improvement of the programme delivery.

4.7.1 Types of Stakeholders for Improvement on Programme Delivery

51. The relevant stakeholders may include:

    i. Internal stakeholders (see Figure 4.4):
        - Students
        - Academic staff

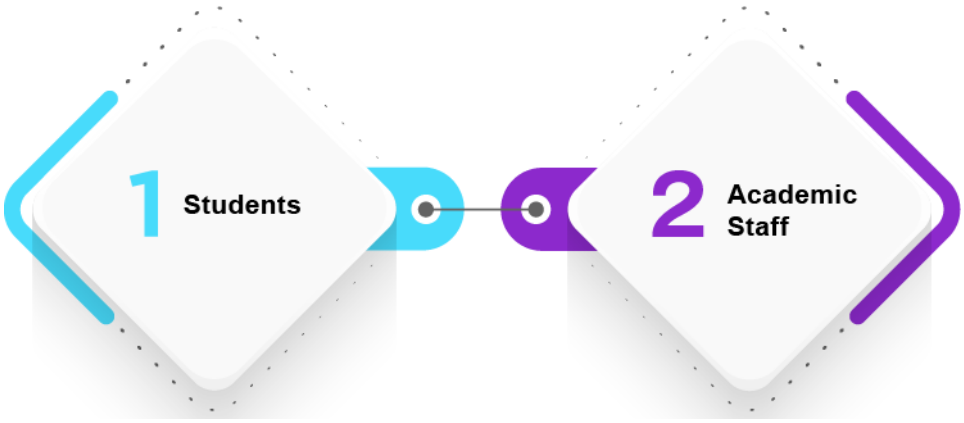


Figure 4.4: Relevant internal stakeholders.

ii. External stakeholders (see Figure 4.5):
- Alumni;
- Professional bodies;
- Government and funding agencies;
- External examiners/assessors;
- Industrial and societal organisations;
- Employers; and/or
- Others, if any.

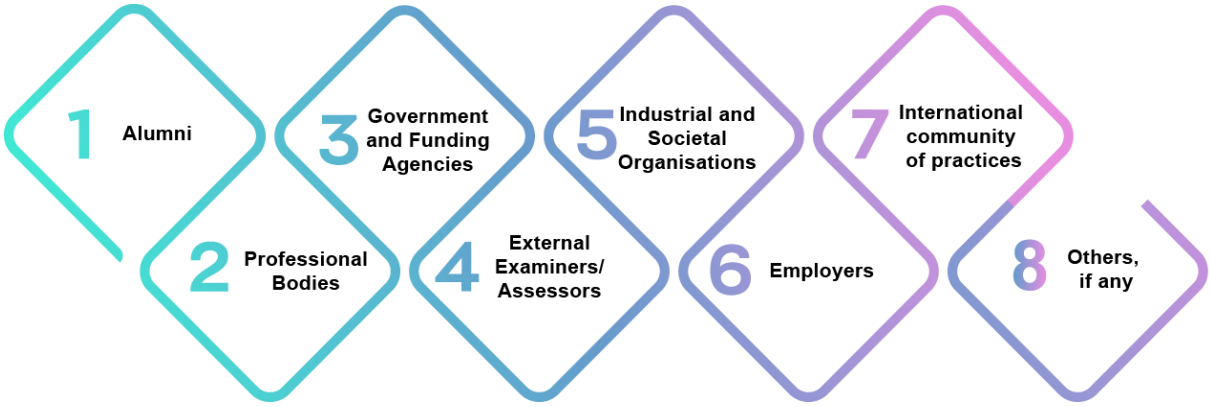


Figure 4.5: Relevant external stakeholders.

4.7.2 Feedback and Instruments on Programme Delivery

52. Feedback items from the stakeholders could be included, such as those illustrated in Figure 4.6.

Figure 4.6: Proposed Instruments for Feedback.
(Disclaimer: The list is not exhaustive)

53. The feedback should be discussed with the related authority, such as the programme review committee, academic committee, faculty/department/unit or senate and others. The committee may suggest action plans for programme improvement and/or revision.

54. All relevant documents should be disseminated to the relevant parties for their action and implementation. Evidence should be indicated in the action plan and reviewed accordingly (see Table 4.1 for possible respondents of the feedback and surveys and the respective instruments that can be employed).

Table 4.1: Potential instruments and documents by the relevant stakeholders.
(Disclaimer: The list of instruments and documents is not exhaustive.)

Stakeholders	Potential instruments and documents
Students	• Students' evaluation • Tracer study • Exit report • Any other feedback documents
Academic staff	• Academic related meeting • Faculty/School/Department/Unit minutes of meetings • Any other related reports
Alumni	• Alumni meeting and reports • Any alumni related reports
Professional bodies, government and funding agencies	• Programme monitoring reports • Audit report • Circulars • Memo • Instructions • Any other related documents
External Examiners/assessors	• External Examiners/Assessors reports • External Examiners/ Assessors minutes of meeting • Any other related documents
Industrial and societal organizations	• Industry advisory minutes of meeting • Industry advisory reports • Any other related documents
Employers	• Internship reports • Industry attachment reports • Any feedback from employers
Other related stakeholders	• Any related documents

4.7.3 Specific Considerations for Open and Distance Learning and Technical and Vocational Education Training Programmes

55. For ODL programmes, students should be given opportunities to provide formal feedback about their experience of the ODL courses/programmes. This may include the ODL course/programme structure, SIMs, learning materials, learning activities and assessments, learning resources, access to the LMS and any other matters. This is to enhance the quality of the courses/programme.

56. For TVET programmes, the COPTPA standard requires the TVET Providers to meet the industrial and occupational standards and industry practices when designing and delivering the TVET curriculum. Hence, it is imperative that the stakeholders from relevant industries be involved in the delivery of the programme, including in the teaching-learning activities and the assessment process. This practice may reduce the gap in the graduates' practical skills and competencies when they enter employment after graduation.

APPENDIX 1 EXAMPLES OF PEO AND PLO

EXAMPLES OF TABLE A1, TABLE A2, TABLE A3 AND TABLE A4 FOR A GENERIC CURRICULUM FOR THE BACHELOR OF EDUCATION PROGRAMME

Table A1: Examples of PEO statements with performance indicators and targets for the Bachelor of Education (B.Ed.) programme.

PEO statement*	Domain	Performance Criteria	
		Indicators	Target**
1. Education practitioners who are knowledgeable with practical skills capable of using appropriate numerical techniques in solving real and complex problems in the educational settings. (Knowledge, cognitive, practical & numeracy)	Knowledge and skills	▪ Graduates who achieve confirmation of their position or promotion to a higher rank in the organisation. ▪ Graduates who are recognized as excellent teacher or subject matter expert teacher.	50% 30%
2. Education practitioners who practice effective communication, dynamic academic leaders that involved in decision making in the field of education through technological advancement for the benefit of the society and the environment. (Communication, leadership, interpersonal, digital skills)	General attributes and attitude	▪ Graduates who are appointed to a position with responsibility to lead a group or team of staff. ▪ Graduates who successfully organise community service or activities that benefit a society or are related to sustainable development.	50% 30%
3. Education Practitioners with positive attitude, entrepreneurial mind set and sustainable practices in enhancing their career. (Ethic and professionalism, entrepreneurial, personal)	Lifelong learning and professional growth	▪ Graduates who are pursuing their study in a formal education leading to a higher degree or engaging in continuous professional development activities or courses for at least 20 hours per year. ▪ Graduates who run their own business or company.	40% 20%

*The establishment of PEOs and PLOs for education practitioners is primarily based on *Standard Guru Malaysia* (SGM), which consists of four major components: knowledge orientation, instructional, community involvement, and personal quality.

*Measured at 3 – 5 years after graduation, which can be increased as part of the CQI process of the PEOs.

Table A2: An example of a PEO-PLO map based on the MQF Second Edition for a generic B.Ed. programme.

PEO*	Cluster 1	Cluster 2	Cluster 3						Cluster 4		Cluster 5
	Knowledge and understanding	Cognitive Skills	Practical Skills	Interpersonal Skills	Communication Skills	Digital Skills	Numeracy Skills	Leadership, Autonomy and Responsibility	Personal Skills	Entrepreneurial Skills	Ethics and Professionalism
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9	PLO 10	PLO 11
1	✓	✓	✓				✓				
2				✓	✓	✓		✓			
3									✓	✓	✓

*Refer to Table A2.1.

Table A3: An example of a PLO-Courses map for the B.Ed. Sc. (Chemistry) programme.

Bachelor of Science Education (Chemistry) Course Name	Course Type*	Course Credit	Programme Learning Outcomes (PLO)										
			1	2	3	4	5	6	7	8	9	10	11
YEAR 1, SEMESTER 1													
General Chemistry	Core	4	✓	✓	✓								
Calculus	Core	3	✓	✓					✓				
History and Development in Education	Core	2	✓			✓					✓		
Philosophy and Current Issues (MPU)	Core	3	✓			✓				✓			
Foundation English	Common	2				✓	✓						
Co-Curriculum I (MPU)	Common	1								✓	✓		
Total		**15**											
YEAR 1, SEMESTER 2													
Organic Chemistry	Core	4	✓	✓	✓								
Science, Technology and Society	Core	3						✓		✓		✓	
Instructional Technology	Core	3						✓				✓	✓
English For Professional	Common	3				✓	✓						✓
Co-Curriculum II (MPU)	Common	1								✓	✓		
Values and Civilization (MPU)	General	3									✓		✓
Total		**17**											
YEAR 2, SEMESTER 1													
Multimedia for Teachers	Core	3				✓		✓				✓	
Analytical Chemistry	Core	4	✓	✓	✓								
Educational Psychology	Core	3				✓					✓		✓
Entrepreneurship (MPU)	Common	3								✓	✓	✓	
Co-Curriculum III (MPU)	Common	1								✓	✓		
Third Language I	General	2											
Total		**16**											
YEAR 2, SEMESTER 2													
Physical Chemistry	Core	4	✓	✓	✓								
Assessment	Core	3	✓	✓									✓
Curriculum And Instruction	Core	3	✓			✓	✓						
School Science	Core	3	✓	✓	✓								
Third Language II	General	2				✓	✓						
Total		**15**											
YEAR 3, SEMESTER 1													
Inorganic Chemistry	Core	4	✓	✓	✓								
Research Methodology	Core	3		✓		✓							✓
Methods of Teaching Chemistry (Microteaching)	Core	3		✓	✓						✓		
STEM Education	Core	3	✓	✓				✓					
Third Language III	General	2				✓	✓						
Total		**15**											
YEAR 3, SEMESTER 2													
Polymer Chemistry	Core	4	✓	✓	✓								
Industrial Chemistry	Core	2	✓	✓									
Counseling for Educators	Core	2	✓		✓	✓							
Innovation in Chemistry Teaching	Core	3		✓				✓				✓	
Problem Solving in Chemistry	Core	3		✓					✓			✓	
Data Analysis	Common	3		✓				✓	✓				
Total		**17**											
YEAR 4, SEMESTER 1													
Environmental Chemistry	Core	4	✓	✓	✓								
Gamification	Core	3	✓			✓		✓					
Sustainable Development Goals: Quality Education	Common	3	✓	✓			✓						
Research Project	Common	4	✓	✓				✓					✓
Inclusive Education	Common	3	✓			✓						✓	
Total		**17**											
YEAR 4, SEMESTER 2													
Practicum	Core	8	✓	✓	✓	✓							✓
Total		**8**											
TOTAL CREDITS		120											

Table A4: An example of a programme assessment plan for the B.Ed. programme.

PEO *(see also Table 2.2)*	**PLO** *(see alsoTable 2.4)* At the end of the Bachelor of Education programme, the students will be able to:	**Recommended Instructional Strategies and Assessment Methods**	**Courses containing CLOs for Direct Measurement of PLO**
PEO 1 on knowledge and skills **(Knowledge, and cognitive, practical and numeracy skills)**	1. Apply advanced knowledge and understanding of theories, concepts, and principles to the structure, content, and methodology in education to address the challenges of a dynamic curriculum. (Knowledge and Understanding)	▪ **Instructional strategies:** Blended learning, direct and interactive instructions. ▪ **Assessment methods:** Written tests and case studies.	Any course from the five components of the core body of knowledge in as follows: ▪ The education foundations component ▪ The professional practice component ▪ The school subject content component ▪ The educational electives component ▪ The education specialisation component
	2. Integrate analytical skills in analysing and solving complex problems related to teaching practices and organisational performance. (Cognitive)	▪ **Instructional strategies:** Interactive instruction, case study, project, group work. ▪ **Assessment methods:** Written test, presentation, essay, report.	▪ Courses related to content and specialisation ▪ Specific theoretical subject
	3. *Demonstrates practical skills in* using *current teaching* techniques *in different educational settings. (Practical skills)*	▪ **Instructional strategies:** Blended learning, experiential learning, practical (studio, laboratory and field based). ▪ **Assessment methods:** Laboratory task/report, product-based, skill-based.	▪ Microteaching course ▪ Professional practice / school practicum ▪ Aquatic ▪ Any courses related to skill or competency based
	4. Use quantitative and qualitative tools and reasoning techniques. (numeracy)	▪ **Instructional strategies:** Interactive instruction, case study, group work. ▪ **Assessment methods:** Written test, essay, report.	▪ Research method ▪ Quantitative and qualitative related course ▪ Final Project
PEO 2 on general attributes and attitude **(Communication, leadership, interpersonal and digital skills)**	5. Practice effective communication skills in oral and written using appropriate approach, methods and strategies. (Communication)	▪ **Instructional strategies:** Interactive instruction, case study, project, group work. ▪ **Assessment methods:** Case studies, projects, presentation.	▪ Literacy / Languages ▪ Courses related to comparative, international and global education. ▪ Academic writing ▪ Final Project
	6. Demonstrate leadership with responsibility and autonomy in all educational setting. (Leadership)	▪ **Instructional strategies:** Case Study, Project, Group Work, Discussion. ▪ **Assessment methods:** Case studies and projects.	▪ Product development related courses ▪ Education Management ▪ Classroom management ▪ Event, Leadership and Recreation Management
	7. Demonstrate interpersonal skills in delivering educational services to stakeholders (Interpersonal)	▪ **Instructional strategies:** Interactive instruction, Case Study, Project, Tutorial, Group Work, simulation. ▪ **Assessment methods:** Presentation, project.	▪ Microteaching ▪ Professional practice / school practicum ▪ Project-based course
	8. Competently use a wide range of suitable digital technologies and appropriate software in different educational settings. (Digital)	▪ **Instructional strategies:** Interactive instructions, group work, case study. ▪ **Assessment methods:** Project, portfolio, presentation.	▪ Product development related courses ▪ Integrated STEM education ▪ Animation and art production ▪ Instructional technology ▪ Final Project
PEO 3 on lifelong learning and professional growth **(Ethic and professionalism, and personal and entrepreneurial skills)**	9. Uphold professionalism and ethics to fulfil professional teaching standards at all times. (Ethic and professionalism)	▪ **Instructional strategies:** Case based learning, discussion forum and experiential learning, forum. ▪ **Assessment methods:** Case studies and projects.	▪ Professional practices / practicum ▪ Academic exercises ▪ Education psychology ▪ Final project
	10. Exhibit entrepreneurial mind-set in response to the changing world of education and for career progression. (Entrepreneurial)	▪ **Instructional strategies:** Project, Group Work, Industrial engagement, Discussion. ▪ **Assessment methods:** Case study or project presentations and reports.	▪ Final Project ▪ Field experience related courses ▪ Creative teaching ▪ Entrepreneurial courses
	11. Exemplify self-advancement and a positive attitude and commitment through continuous academic and professional development. (Personal)	▪ **Instructional strategies:** Case study, project, group work. ▪ **Assessment methods:** Case studies, project, portfolio (individual).	▪ Academic exercise ▪ Classroom management ▪ Final year project

APPENDIX 2 MQF LEVEL DESCRIPTOR

Cluster 1: Knowledge and Understanding

Certificate Level 3	Descriptor Knowledge and Understanding Describe basic principles, theories and skills, within a significant range of knowledge in a subject and discipline to address well-defined, varied and routine tasks/work. PLO Knowledge and Understanding **Describe basic principles, theories and skills, within a significant range of knowledge** in a (subject and discipline) **related to** (routine tasks/work).
Diploma	Descriptor Knowledge and Understanding Demonstrate systematic comprehension (understanding) of a broad range of complex technical and theoretical knowledge and skills to undertake varied, complex, routine and non-routine tasks/ study within a field/discipline. PLO Knowledge and Understanding **Demonstrate systematic knowledge and understanding of a** (broad range of complex technical and theoretical knowledge and skills) **related to** (the field of study, work and/ or practice).
Degree	Descriptor Knowledge and Understanding Describe advanced and comprehensive, theoretical and technical knowledge and demonstrate relevant skills in a specialized field, or of a multidisciplinary nature related to the field of study, work and/or practice. PLO Knowledge and Understanding **Describe advanced and comprehensive, theoretical, and technical knowledge** (and demonstrate relevant skills in a specialized field, or of a multidisciplinary nature) **related to** (the field of study, work and/or practice).
Masters	Descriptor Knowledge and Understanding Demonstrate originality and independence in undertaking analytical and critical evaluation, and synthesis of complex information, specialized concepts, theories, methods, and practice in a field(s) of study/practice as a basis for research. PLO Knowledge and Understanding Demonstrate originality and independence in undertaking analytical and critical evaluation, and synthesis of (discipline-based) in a field(s) of (field of work/study/practice related to research).

Cluster 3: Practical skills

Certificate	Descriptor practical skills Organise, operate and complete, using information appropriate methods, tools, technologies, materials to solve/ address routine and some non-routine tasks/problems within an area of work and/or study under supervision. PLO practical skills Operate (according to field related to routine and some non-routine tasks/problems) within (an area of work and/or study under supervision).
Diploma	Descriptor practical skills Apply a limited range of practical skills, essential tools, methods and procedures to perform required tasks/work. Reflect and make adjustments to practices and processes, as necessary, related to routine or nonroutine tasks. PLO practical skills Perform (a limited range of practical skills, essential tools, methods and procedures to perform required tasks/work including reflecting and adjust practices and processes, as necessary, related to routine or nonroutine tasks) in (the field of study, work and/or practice).
Degree	Descriptor Practical Skill Apply a range of essential methods and procedures to solving a broad range of complex problems. Review, make adjustments and supervise related practices and processes concerning field of specialisation. PLO Practical Skill Perform (a range of essential methods and procedures to solving a broad range of complex problems) in (the field of study, work and/or practice).
Masters	Descriptor Practical Skill Conduct standard and specialized research methods/ approaches and/or apply practical skills, tools or investigative techniques which are informed by knowledge at its forefront and the latest development in the subject/discipline. PLO Practical Skill Conduct specialized/independent research (related field/ discipline) at its forefront and the latest development in the (subject/discipline).

APPENDIX 3 INITIATIVES UNDER MINISTRY OF HIGHER EDUCATION

1. There are various initiatives introduced by the Ministry of Higher Education (MOHE) to encourage HEI to adopt the best practices in higher education. In this section, some of the initiatives are highlighted.

2. The Experiential Learning and Competency-Based Education Landscape (EXCEL) framework is aimed at transforming academic programmes to produce lifelong learners, innovative and adept entrepreneurs, creative practitioners, and change-makers. EXCEL is grounded on the elements of fluid and organic curriculum and immersive experiential learning, and it is formulated based on The Malaysian Higher Education Blueprint, and an extension of The Future Focused Curriculum and MyHE 4.0. The four core 'thrusts' of EXCEL are:

    i. Real (Research Infused Experiential Learning);
    ii. Ideal (Industry Driven Experiential Learning);
    iii. Care (Community Resilience Experiential Learning);
    iv. Poise (Personalised Experiential Learning).

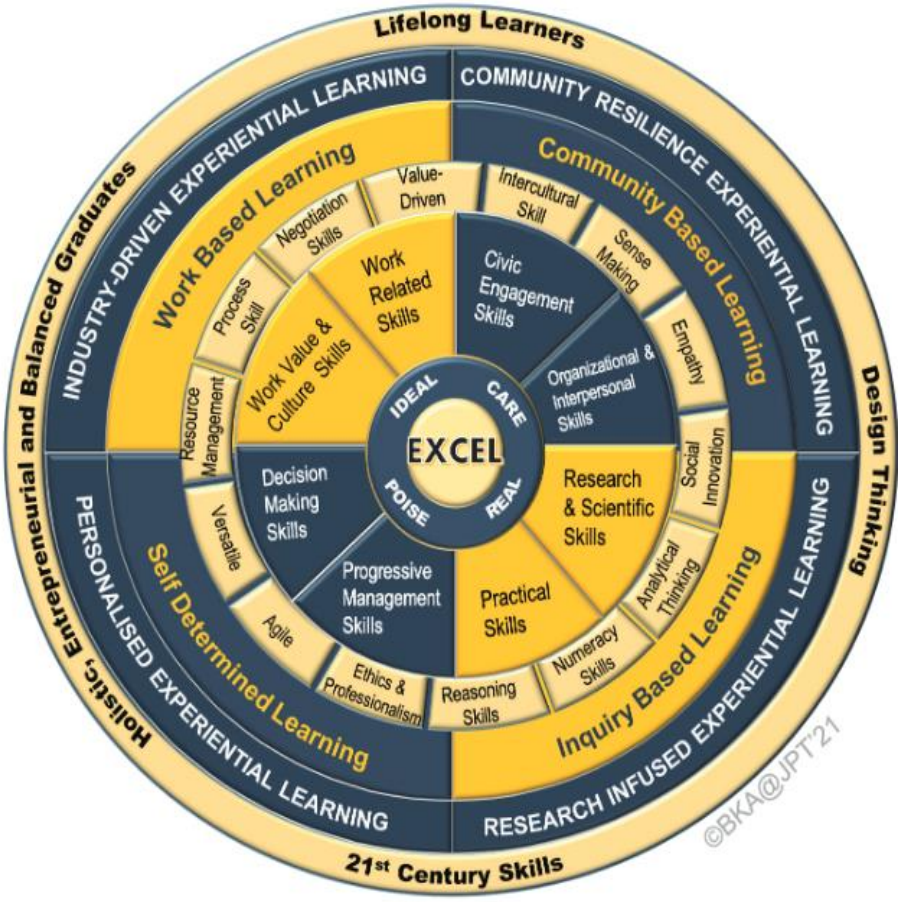


Figure A.1: EXCEL Framework.
(Source: MOHE, 2021)

3. The purpose of introducing EXCEL is to project an inventive framework and to structure experiential learning and competency-based learning in Malaysian Higher Education in a structured and systematic way. This is critical to ensure initiatives taken to design the students learning experience are concerted and in tandem, to achieve the objective of producing resilient and change-ready graduates. The figure below explains EXCEL as an infographic.

4. Future Ready Curriculum is a framework that highlights three elements in the aspects of curriculum structure, learning and teaching delivery and assessment, that are constructively aligned to prepare graduates in meeting the challenges of the 21st century, as shown in Figure A.2. These elements are described as follows:

   i. Future Ready Curriculum requires the curriculum structure to be fluid and organic, and not rigid and fixed to allow the programme to be responsive to current and future needs.

   ii. Transformative Learning and Teaching Delivery is promoted through redesigning learning spaces, leveraging the latest 4th Industrial Revolution technologies, or Industry 4.0 (IR4.0), and promoting immersive learning towards the achievement of learning goals.

   iii. Alternative Assessments promote a holistic assessment of the outcomes as well as the learning process, focusing on what the student can do rather than merely focusing on mastery of knowledge.

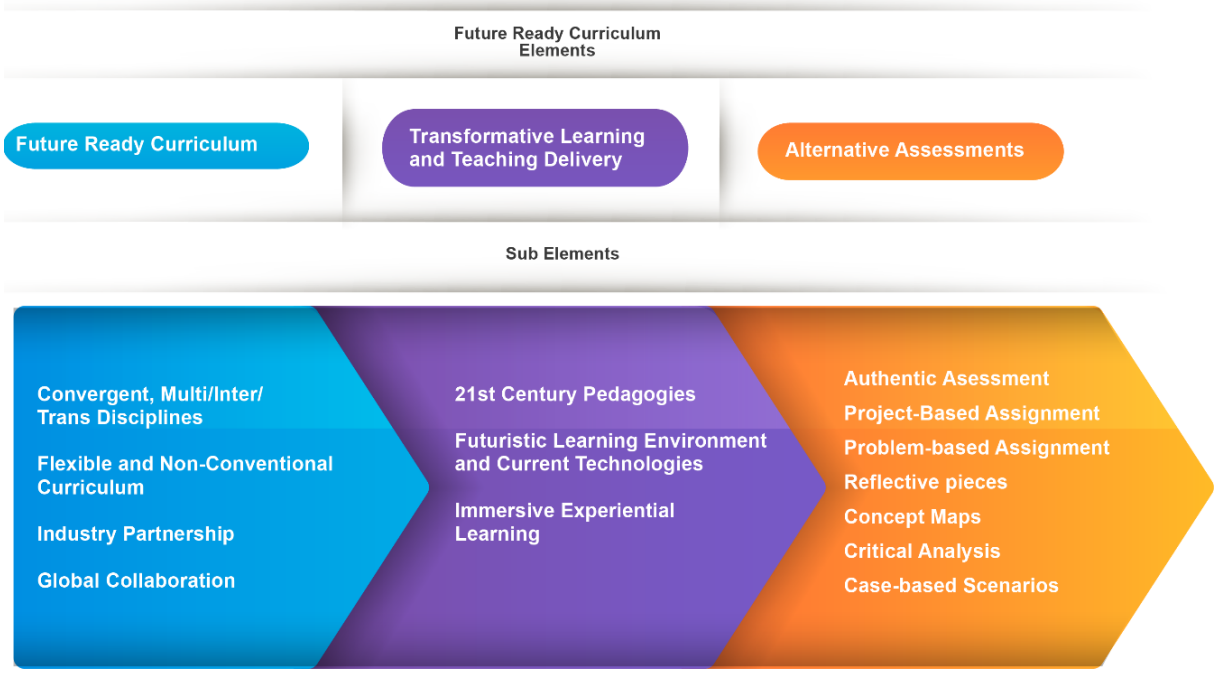


Figure A.2: Elements of Future Ready Curriculum.
(Source: MOHE, 2021)

5. Through a more flexible, consistent, and personalised approach to academic content design, instruction, and assessment, teachers will have robust and adaptive tools to

customise the instruction for groups of students or on a student-to-student basis to ensure relevance and deep understanding of complex issues and topics. Providing multiple sources of high-quality academic content offers students much greater opportunities to personalise learning and reflect on their own work, think critically, and engage frequently to enable a deeper understanding of complex topics. Data are the building blocks of diagnostic, formative and summative assessments all of which are key elements in a system where learning is personalised, individualised, and differentiated to ensure learner success.

6. The curriculum and teaching methods are revamped with new critical elements such as experiential learning, an organic and flexible curriculum, and a lifelong learning mindset to develop future-ready graduates. Graduates' skillsets are also further enriched to embrace opportunities within the gig economy.

7. The higher education sector is progressing fast towards IR4.0 and for the institutions to attain and maintain their institutional sustainability. It is of foremost importance that they must continue to improve their teaching and learning delivery system to produce quality graduates who are ready for the workplace, in line with the Malaysian Higher Education Framework 4.0 (MOHE, 2018) refer to Figure A.3.

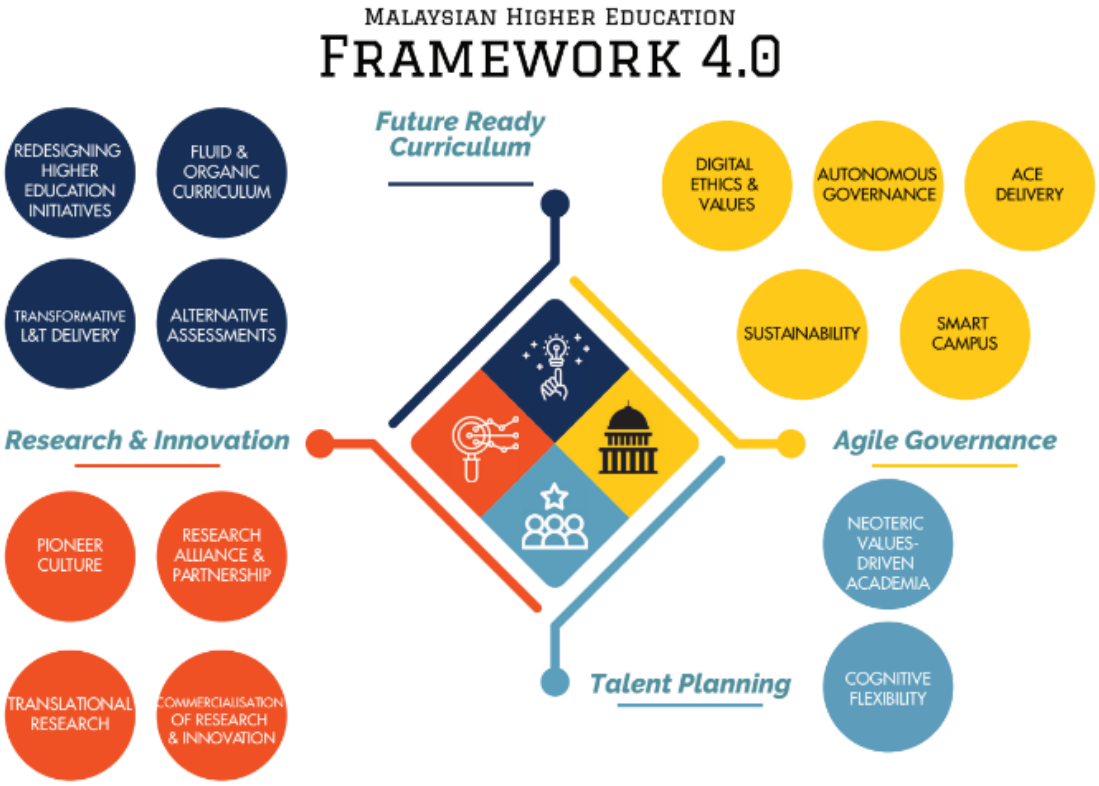


Figure A.3: Malaysia Higher Education Framework 4.0.
(Source: MOHE, 2018)

8. Programme developers may also refer to High Impact Educational Practices (HIEPs) (as the example in Figure A.4), which provide techniques and designs for teaching and learning that have proven to be beneficial for student engagement and successful learning for students from various backgrounds.

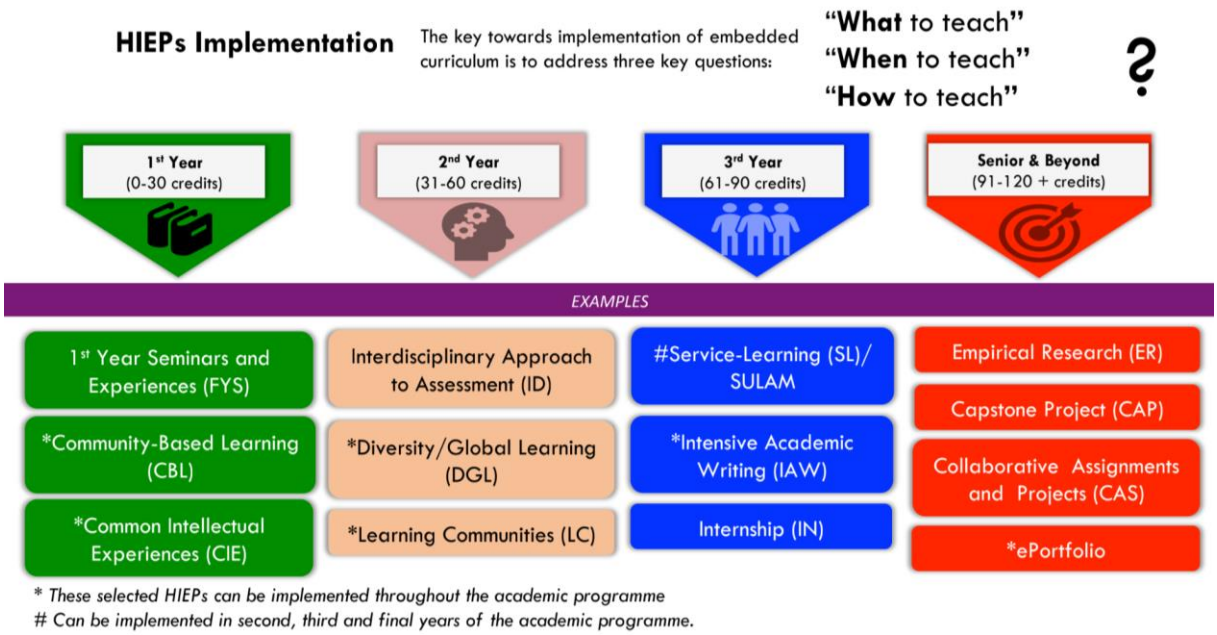


Figure A.4: High Impact Educational Practices (HIEPs) implementation guidelines. (Source: MOHE, 2020)

APPENDIX 4 LEARNING TAXONOMIES

1. The word taxonomy refers to grouping on the basis of similarities. Learning taxonomies are models that represents grouping of observed learning outcomes. Some taxonomies like Bloom's Taxonomy recognised types of learning domains like cognitive, psychomotor and affective and arrange each of the domains hierarchically. Meanwhile, other learning taxonomies like Structure of Observed Learning Outcome (SOLO) further outline the learning process on top of learning outcomes.

2. Bloom's Taxonomy (consisting of cognitive, affective and psychomotor domains) was created in 1956 under the leadership of educational psychologist Dr Benjamin Bloom to promote higher forms of thinking in education. Lorin Anderson, a former student of Bloom, and David Krathwohl revisited the cognitive domain in the mid-nineties and made some changes, with perhaps the three most prominent ones being changing the name from a noun form to a verb form, as well as swapping the creating and evaluating levels (Anderson, Krathwohl, Airasian, Cruikshank, Mayer, Pintrich, Raths, Wittrock, 2000).

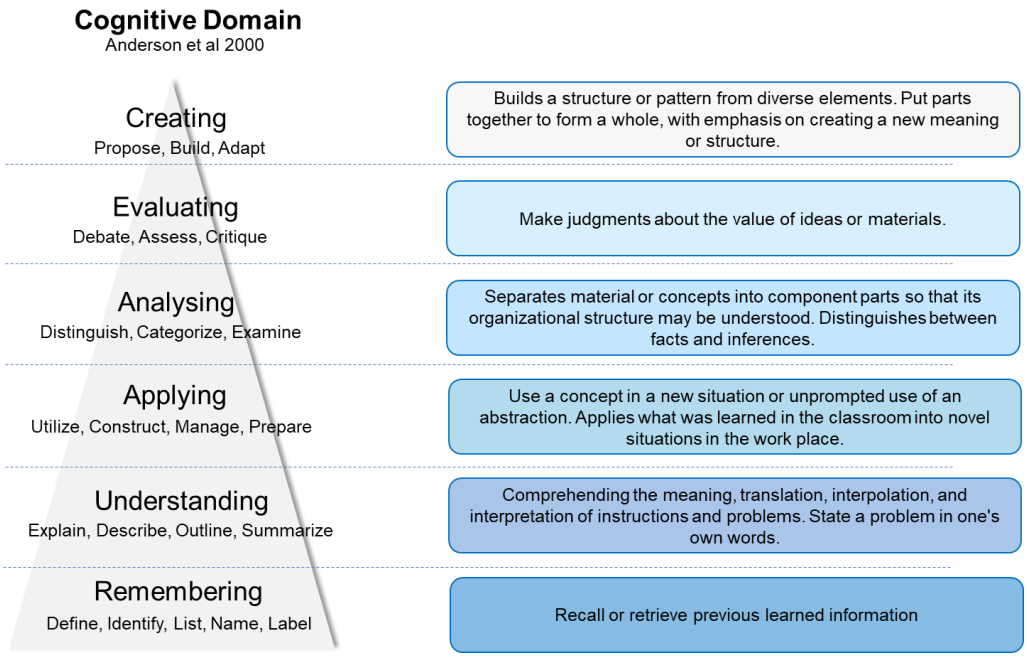


Figure A.5: Cognitive domain.

3. The psychomotor domain (Simpson, 1972) includes physical movement, coordination, and the use of the motor-skill areas.

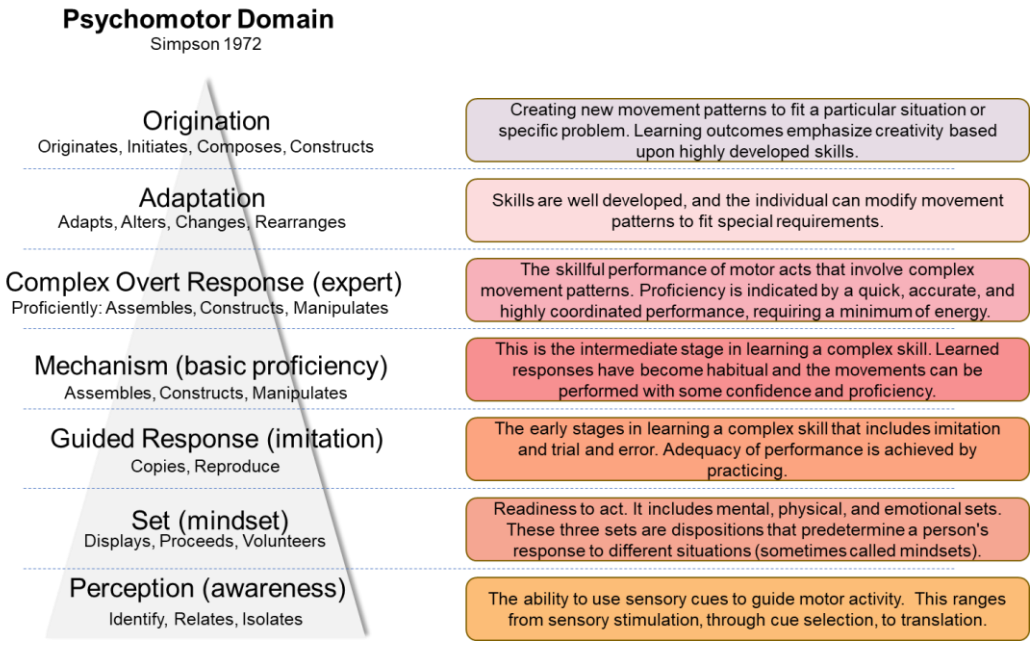


Figure A.6: Psychomotor domain.

4. The affective domain (Krathwohl, Bloom, Masia, 1973) includes the manner in which we deal with things emotionally, such as feelings, values, appreciation, enthusiasms, motivations, and attitudes.

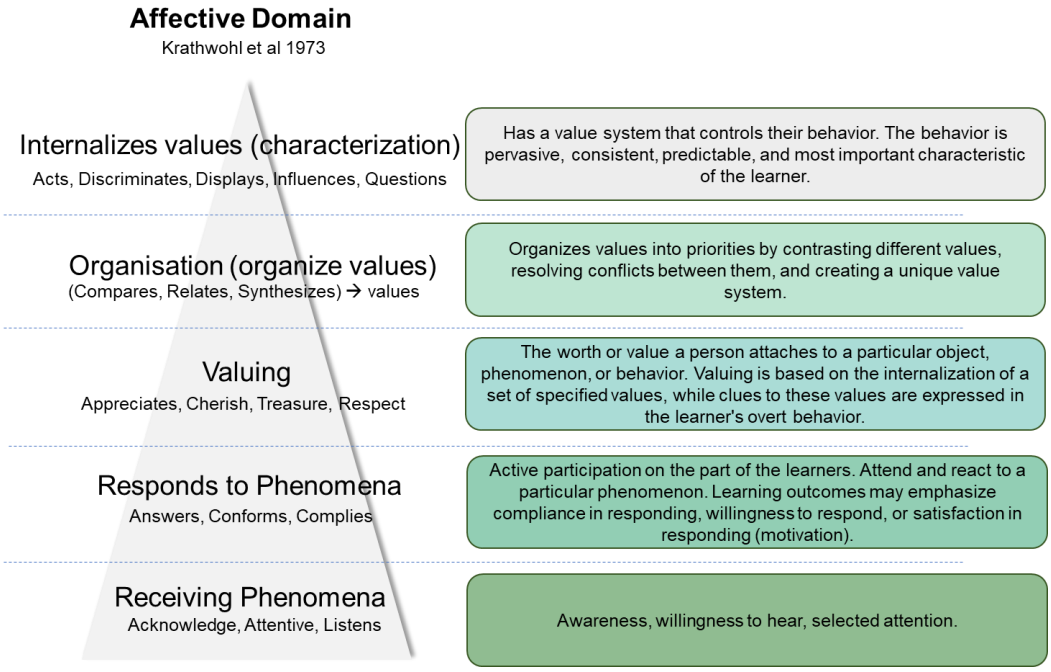


Figure A.7: Affective domain.

5. Other systems or hierarchies that have been devised include the Structure of Observed Learning Outcome (SOLO). Figure A.4 illustrates a comparison between SOLO learning classification and Bloom's cognitive domain with their associated learning verbs.

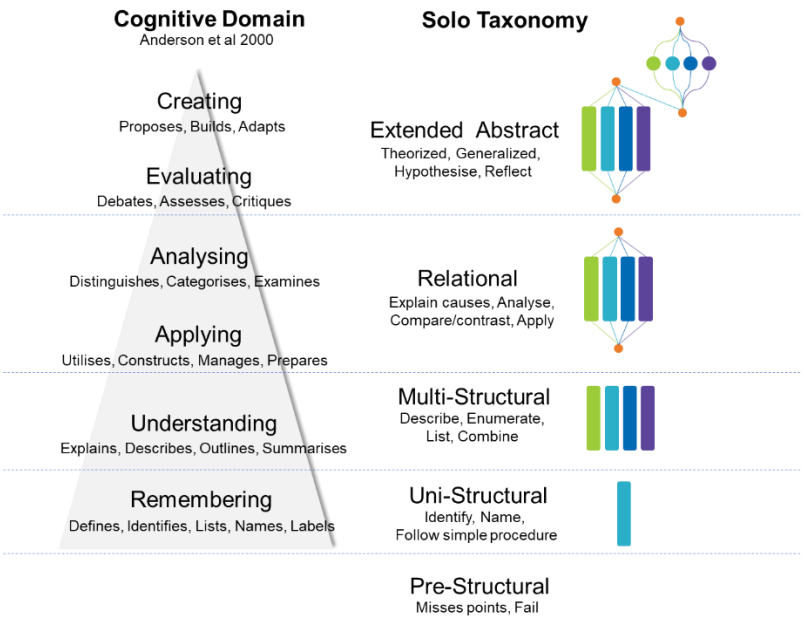


Figure A.8: Revised Bloom's Taxonomy in comparison with the SOLO taxonomy.

6. While SOLO taxonomy was initially developed to categorise cognitive learning outcomes, it can be extended to include psychomotor and affective learning outcomes as well. The key is to identify the relationships and connections between cognitive, psychomotor and affective aspects within the learning context. By combining the learning domains, we can foster a more comprehensive understanding and competence and students are able to transfer knowledge, skills and attitudes to real-world context holistically.

7. For example, let's consider a scenario where students are learning how to play a musical instrument. At the relational level, students may demonstrate their competence by not only understanding the theoretical aspects of music theory (cognitive learning) but also by applying that knowledge through playing the instrument (psychomotor learning). Each structure element in SOLO can represent any part of the concepts/ideas (e.g., music theory and fingering skills are part of musical instrument playing competency), part of the process (e.g., determining voltage and current is part of determining electrical power) or part of the objects (e.g., tail and whiskers are part of a cat's structure).

APPENDIX 5 LIST OF LEARNING AND TEACHING ACTIVITIES

Method	Description	Activities
Lecture	Instructor presenting material and answering student questions that arise. Students receive, take in and respond	Demonstration, modelling, questions (convergent), presentation, slideshow, note-taking
Interactive Lecture	A lecture that includes 2 – 15 minutes breaks for student activities every 12 – 20 minutes.	Multiple-choice items, solving a problem, comparing and filling in lecture notes, debriefing a mini case study, pair-compare, pair-compare-ask, reflection/reaction paragraph, solve a problem, concept mapping activities, correct the error, compare and contrast, paraphrase the idea, answer knowledge and comprehension questions
Directed Discussion	Class discussion that follows a predetermined set of questions to lead students to certain realizations or conclusions, or to help them meet a specific learning outcome	Direct, specific, or open-ended questions that are connected to learning outcomes and include varied cognitive processes
Direct Instruction	Lecturing, but includes time for guided and independent practice	Create mind/concept maps, free writes, one-sentence summary, one minute papers
Guided Instruction	Direct and structure instruction that includes extensive instructor modelling and student practice time	Showing and explaining examples, model strategies, demonstrate tasks, classify concepts, define vocabulary, scaffold steps
Just-in-time Teaching	Instructor adjusts class activities and lectures to respond to the misconceptions revealed by assessing students' prior knowledge	Warmups, Conceptual questions (usually a quiz) to motivate students to do the readings
Experiential Learning	Students focus on their learning process through application, observation and reflection	Debates, panel discussion, press conference, symposium, reflection journals, lab experiments
Inquiry-based or Inquiry Guided Learning	Students learning or applying material in order to meet a challenge, answer a question, conduct an experiment, or interpret data	Worked examples, process worksheets, analyse data sets, evaluate evidence, apply findings to a situation or problem and synthesize resolution(s), answer probing questions about a given research study, ask and answer "*What will happen if…?*" questions
Problem-Based Learning	Student groups conducting outside research on student-identified learning issues (unknowns) to devise one or more solutions or resolutions to problems or dilemmas presented in a realistic story or situation	Review and critique research studies, work in groups/teams to solve a specific open-ended problem, labs
Project-Based Learning	Students apply course knowledge to produce something; often paired with cooperative learning	Group work/team project – design or create something – e.g., a piece of equipment, a product or architectural design, a computer code, a multimedia presentation, an artistic or literary work, a website, research study, service learning
Role-Play and Simulations	Students acting out roles or improvising scripts, in a realistic and problematic social or interpersonal situation. Students playing out, either in person or virtually, a hypothetical social situation that abstracts key elements from reality	Real-life situations and scenarios, debates, interviews, frame simulation
Field Work and Clinicals	Students learning how to conduct research and make sound professional judgements in real-world situations	Internships, assistantships, community service, shadowing

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