Optimizing Quality Approaches and Investigating Lecturers' Perception for Course Quality Assurance in Higher Education[*]

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Abstract: Courses are the fundamental building blocks of educational programs, serving as a tangible representation of student attainment and the desired learning outcomes of the program. Despite their pivotal role in education, however, a standardized framework for the development, implementation, and enhancement of course specifications remains elusive. Given that different programs may employ varying formats with differing levels of detail, it is critical to establish a universal framework that enables instructors to adhere to quality standards at the program level. To this end, leveraging the ASEAN University Network – Quality Assurance (AUN-QA) and Quality Matters Rubric, this study seeks to optimize course quality assurance requirements and assess lecturers' perception of these proposed guidelines. Drawing on document analysis, semi-structured interviews, and importance-level measurement, the findings of this study underscore the significance of eight criteria, comprising a total of 25 quality requirements, in ensuring course quality. These criteria include learning outcomes, structure and content, instructional approaches, learning assessment, learner support, staff, and output. Notably, these criteria align with the Plan-Do-Check-Act (PDCA) cycle theory, thereby promoting continuous improvement in education.

Keywords: *Course quality assurance, course development, higher education, Plan-Do-Check-Act cycle.*

Introduction

Harvey and Green (1993) argued that quality assurance is critical for establishing the requisite systems, procedures, and processes to achieve the intended quality standards. They suggested that quality within higher education can be conceptualized in various ways, including quality assurance, quality management, and total quality management. Specifically, quality assurance is aimed at maintaining the quality of academic programs or institutions. In contrast, quality management involves the use of tools and systems to assess the satisfaction of stakeholders and the performance of the organization. Total quality management, on the other hand, entails continuous quality improvements and meeting stakeholders' demands (Asif & Raouf, 2013). In higher education, quality assurance of programs or institutions can be verified through quality assessment and accreditation certifications from independent and reliable organizations. Various international quality accreditation and assessment approaches are available to assess and enhance program quality, such as the Accreditation Agency for Study Programmes in Engineering, Informatics, Natural Sciences and Mathematics (ASIIN), Accreditation Board for Engineering and Technology (ABET), and ASEAN University Network – Quality Assurance (AUN-QA) (Almuhaideb & Saeed, 2020; Feisel, 2009; Pham & Nguyen, 2021; Pramono et al., 2018). In addition, there was a transformation in education after the COVID disruption, which led to digitalized education and training, the development of open educational platforms, and the promotion of online teaching and learning. So the quality of education does not only focus on traditional education but also the quality of online learning and distance education (Zhu & Liu, 2020).

Systematic approaches are crucial in ensuring the quality of academic programs and institutions. The systematic approaches to quality assurance enhance the value of all stakeholders, including lecturers, staff, students, employers, and the government (Tetteh et al., 2021). Notably, students are critical stakeholders in education, and the scholarly

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discourse still grapples with their role as customers or consumers in education (Williams & Harvey, 2015). For the institution, this supports enhancing the reputation, and saving costs (Pham, 2018). Widrick et al. (2002) underscored that program design, course sequence, and content are the essential parameters for curriculum development and quality. In the current assessment and accreditation framework, quality assurance is observed in various dimensions, such as expected learning outcomes, program specifications, academic staff, teaching and learning approaches, student assessment, facilities, student support, outcomes, and stakeholders' satisfaction (ASEAN University Network, 2021). Interviewing stakeholders is also a mandatory step to verify and cross-check program quality. However, stakeholders may define the quality of education differently, depending on their expectations and values (Tetteh et al., 2021).

While quality assessment or accreditation systematically reviews and enhances program reputation and quality, it also has drawbacks, such as being time-consuming and having limited improvements in teaching and learning (Pham, 2018). Course syllabi, teaching and learning processes, and assessments are critical evidence of quality evaluation, and course quality is the backbone of educational programs (Ali & Shastri, 2010; Pratasavitskaya & Stensaker, 2010). Thus, a systematic approach is necessary to ensure course quality from design to implementation and continuous improvement. This study aims to optimize the essential aspects and requirements for ensuring course quality assurance and investigate lecturers' perceptions of the proposed requirements. This research could provide the framework to develop, implement, and improve both online and onsite new courses. In addition, it is also suitable for improving the current courses and coaching the lecturer about quality assurance at the course level.

Quality Management in Higher Education: Academic Program

Quality management is critical to ensuring and enhancing the quality of products and services (Asif & Raouf, 2013); it provides systematic approaches for continuous improvement and transformation in higher education and requires effort, leadership, and stakeholder commitment (O'Mahony & Garavan, 2012). Three dimensions can be applied in teaching, research, and operations at higher education, including quality of design, conformance, and performance quality (Mergen et al., 2000; Widrick et al., 2002). In higher education, the educational program quality may relate to the perspective of key stakeholders such as students, employers, teaching staff, etc. Although there may be different understandings of quality in higher education, the essential purposes are continuously maintaining and enhancing quality (Harvey & Green, 1993). Quality could be determined by stakeholders' satisfaction/feedback (O. Belash et al., 2015; O.Y. Belash & Ryzhov, 2018; Tetteh et al., 2021). Quality is promoted and maintained systematically by following quality assurance frameworks, accreditation, and assessment from international organizations such as the ASIIN accreditation, ABET accreditation, and AUN-QA assessment (Johnson, 2017).

ASIIN Accreditation

ASIIN is a European accreditation framework used to confirm the quality of academic programs from bachelor to doctoral degrees since 1999; up to 2020, ASIIN has conducted around 5,000 accreditations in Germany and over 700 accreditations internationally in more than 40 countries. ASIIN offers accreditation across a range of disciplines, including engineering, natural sciences, mathematics, medicine, computer science, economics, and various interdisciplinary fields. This accreditation adheres to learning outcomes-oriented professional standards, aligning with the European Qualifications Frameworks and the European Standards and Guidelines. The core requirements set by ASIIN encompass five key areas: (a) the degree program's concept, content, and execution; (b) the examination system, its philosophy, and organization; (c) available resources; (d) transparency and documentation practices; (e) quality management processes, including evaluation and improvement strategies. Each of these areas entails detailed criteria, such as the degree program's objectives and outcomes, program title, curriculum, entry requirements, workload and credit allocation, teaching approaches and methodologies, examination protocols, faculty and professional development opportunities, financial and material resources, module outlines, degree and supplementary documents, applicable regulations, and quality management systems (ASIIN, 2023).

ABET Accreditation

ABET is an international accreditation standard in the USA; it was established in 1983, accredited with over 4,000 programs from 40 countries. In 2022, ABET was accredited with around 203 programs, and its criteria are suitable for engineering programs with compulsory requirements such as the math proposition, engineering degree, etc. ABET accreditation outlines eight foundational criteria: students, educational objectives of the program, outcomes for students, ongoing enhancement, curriculum, faculty qualifications, facilities, and support from the institution. Moreover, ABET establishes specific program criteria, detailing particular requirements for curriculum and faculty within disciplines such as applied and natural sciences, computing, engineering, engineering technology, and related fields (ABET, n.d.).

AUN-QA Assessment

The AUN-QA assessment is one standard approach to assess the quality of academic programs and institutions in ASEAN. AUN-QA evaluated the first program in 2007. By 2022, AUN-QA assessed over 1,000 programs and institutions, both

online and on-site assessment. In addition, the number of programs was continuously increasing. In 2021-2022, 224 programs were evaluated by AUN-QA (ASEAN University Network, 2022) compared to 203 by ABET, indicating its recent popularity among educational quality approaches. At the program level, the AUN-QA program assessment (version 4.0) was launched in 2021 and has eight criteria with 53 requirements. Four criteria highlight key aspects of the program, including expected learning outcomes, program specifications (structure and content), instructional methods (teaching and learning activities), and evaluation and assessment of student learning. Three criteria are centered on resources, covering academic staff, student services, and facilities and infrastructure. The final criterion addresses results, encompassing both outputs and outcomes. These criteria are applied to assess any program to ensure the quality of higher education programs. For course, the AUN-QA framework lists the course outline, such as course title, course requirements, expected learning outcomes, teaching, learning, and assessment methods, course description, outline, or syllabus, and details of student assessment (ASEAN University Network, 2021). Table 1 describes the similarity in quality assurance aspects between AUN-QA, ASIIN assessment, and ABET accreditation.

Table 1. The Benchmark Quality Aspects of the AUN-QA, ASIIN, and ABET Framework

AUN-QA (version 4.0, 2021)	ASIIN (version: 07.12.2021)	ABET
Criterion 1. Expected learning outcomes	1. The degree program - 1.1. Objectives and learning outcomes of the degree program (intended competence profile)	Criterion 2. Program educational objectives Criterion 3. Student outcomes
Criterion 2. Program structure and content	1. The degree program - 1.3. Curriculum (content, structure of the program, student mobility, periodic review of the curriculum) 4. Transparency and documentation - 4.1 Module descriptions	Criterion 1. Student (graduation requirement) Criterion 3. Student outcomes Criterion 5. Curriculum
Criterion 3. Teaching and learning approach	1. The degree program - 1.6. Didactics and Teaching methodology	Criterion 5. Curriculum
Criterion 4. Student assessment	2. Exams: system, concept, and organization	Criterion 4. Continuous improvement (student outcomes)
Criterion 5. Academic staff	3. Resources - 3.1. Staff and staff development	Criterion 6. Faculty
Criterion 6. Student support services	1. The degree program - 1.4. Admission requirements 1. The degree program - 1.5. Workload and credits	Criterion 1. Students (student admission, evaluation of student performance, advising and career guidance, records of student work)
Criterion 7. Facilities and infrastructure	3. Resources - 3.2. Funds and equipment	Criterion 7. Facilities
Criterion 8. Output and outcomes	5. Quality management: quality assessment and development	Criterion 4. Continuous improvement

Although the number of criteria and its description are varied, AUN-QA, ASIIN, and ABET have similarities in assuring program quality, including learning outcomes, curriculum, teaching and learning approaches, learning assessment, quality of staff, and facilities. In addition, those approaches focus on continuous program improvement. In curriculum, course syllabi involved in the program are the essential evidence to achieve program learning outcomes.

This study focuses on AUN-QA because of the similar aspects of the AUN-QA framework and others described in Table 1. Other than that, it is increasing in popularity in ASEAN countries, is accepted by universities in the region, and is relevant to the educational contexts in ASEAN. AUN-QA assessment is accepted to improve the effectiveness of the quality assurance system, and it is a principles-based framework with the characteristics including be systemic and integrated scope of review, focus on areas for improvement, etc. In addition, the PDCA (Plan-Do-Check-Act) cycle theory was applied to monitor quality assessment in the AUN-QA framework (ASEAN University Network, 2021; Heywood, 2007).

Quality Assurance at the Course Level

While quality assurance of program institutions is discussed systematically, and framework and guidelines are available in the literature, the course quality is only mentioned in the program accreditation or assessment, still depends on the instructors, and is not thoroughly analyzed. A unified framework applicable to the course level is found missing in the literature. This functional unit is essential to drive the program's success as it includes practical aspects concerning instructors and students (Asif & Raouf, 2013). Scott (2003) examined the qualities of effective learning experiences in higher education courses, highlighting: (a) characteristics of instructors, such as enthusiasm, expertise, experience, effective communication, openness to learning from and collaborating with students, and a focus on student needs; (b) pedagogical approaches, including active learning, interaction and discussion within the classroom, practical application

of knowledge, and prioritizing depth of understanding in course structure; (c) the classroom setting, emphasizing the importance of relationships and the overall atmosphere; (d) assessment methods. Furthermore, the presence of these attributes in an intensive course leads to numerous advantages for students, including increased concentration, targeted learning, positive classroom dynamics, memorable learning experiences, thorough discussions, reduced procrastination, and improved academic achievement. Scott's suggestions do not fully ensure the course's quality. In addition, scholars discussed course quality using teaching questionnaires, student satisfaction (Goos & Salomons, 2017; Ramsden, 1991), and teaching evaluation (Macfadyen et al., 2016). Quality of teaching and effectiveness could be evaluated by measuring good teaching, clear goals and standards, appropriate workload, appropriate assessment, and generic skills development (Byrne & Flood, 2003). However, course evaluation is only a part of constructive alignment and may not link effectively with course development (Edström, 2008).

The Quality Matters (QM) rubric is a widely recognized tool for ensuring the quality of online and blended courses, as noted by Elaasri and Bouziane (2019). It is a rubric-based approach to quality assurance that encompasses eight main categories with a total of 41 specific requirements. These categories include an overview and introduction of the course, learning objectives, assessments and measurements, instructional materials, learning activities and interactions, course technology, support for learners, and accessibility and usability (Quality Matters, 2023). The QM rubric offers significant benefits to both educators and students. For instructors, it provides a structured framework to align course and unit objectives with assessments and instructional resources, thereby streamlining course design and planning. Students thought that QM implementation provided the consistency of learning expectation and grading policy (Bento & White, 2010). QM rubric allows educators to self-assess the quality of their course but does not mention output and outcome to improve continuously. QM rubric could be a helpful framework, though not perfect for course design (Gregory et al., 2020). However, the quality matter rubric focuses on online courses rather than regular ones.

In addition, instructors and instructional designers have to follow the assessment and accreditation system to develop and implement the courses to ensure that the course will address specific requirements of the accreditation system (Felder & Brent, 2003). However, it requires instructors to understand all criteria critically, even the undirected relevant ones. Most quality assurance approaches tend to access/evaluate the program or course after implementation. No universal framework has been accepted to develop and assess course specifications. Courses are the functional units of the programs. Developing a standard framework can help control the program's quality of courses. This study aims to optimize the key aspects and requirements for quality assurance at the course level by adopting trustworthy approaches and investigating the lecturers' perceptions of the proposed requirements.

Despite the extensive focus on quality assurance at the program and institutional levels, there is a notable gap in the literature regarding the quality assurance of individual courses. Current frameworks, such as ASIIN, ABET, and AUN-QA, primarily address broader programmatic and institutional standards but lack detailed guidance on ensuring the quality of specific courses within these programs. This research gap has become more apparent due to the recent changes in education following the COVID-19 pandemic, which have highlighted the need for robust quality assurance mechanisms that can adapt to both traditional and digital learning environments. While tools like the QM rubric exist for online courses, they do not comprehensively address continuous improvement and stakeholder satisfaction across all types of courses. Additionally, existing quality assurance approaches do not fully explore practical aspects of course quality, such as instructor characteristics, teaching methods, and assessment strategies, nor do they provide a standardized framework to guide instructors.

Moreover, instructors and instructional designers must follow assessment and accreditation systems to develop and implement courses that meet specific accreditation requirements (Felder & Brent, 2003). This process requires instructors to critically understand all criteria, including indirectly relevant ones. Most quality assurance approaches tend to evaluate the program or course after implementation, and no universal framework has been accepted to develop and assess course specifications. Since courses are the functional units of programs, developing a standard framework can help control the quality of courses within a program. This study aims to fill this gap by developing a comprehensive framework for course-level quality assurance, focusing on optimizing essential aspects and requirements and investigating lecturers' perceptions to enhance both new and existing courses. This research is particularly timely and relevant, given the ongoing changes in educational delivery methods and the increasing need for adaptable quality assurance mechanisms.

Methodology

Data Collection Procedure

This descriptive research aims to describe the quality assurance requirement for the course by interviewing participants, analyzing documents, and investigating the importance of the proposed requirements. Thus, this study used document analysis, semi-structured interviews, and survey research methods to collect data.

There were two phases of data collection. In the first phase, semi-structured interviews were conducted with three interviewees, including a quality assurance expert (E) who had the assessor certificate, a senior lecturer (S), and a junior (young) lecturer (Y), to explore their perspectives on the quality of the course. Each interview session was 45 to 60 minutes; the interview session had three parts, including an introduction part to introduce the purpose of the interview,

ask for recording permission, and ask for the interviewee's background; the course development part to focus on the elements of course development; and quality assurance at course level. The detailed structure is presented in Appendix 1. AUN-QA assessment framework (version 4.0, 2021) and Quality Matter rubric were analyzed and mapped in this phase.

The second phase was an online survey to explore the important level of proposed indicators/requirements for course development, implementation, and improvement. Participants were asked to rank the importance of each requirement to ensure the quality of a course based on a 5-Likert scale (1 = Not important at all; 2 = Of little importance; 3 = Of average importance; 4 = Very important; 5 = Absolutely essential) (Inglis, 2008). Besides, one open-ended question allowed participants to share their opinions on each requirement and quality assurance of the course. Participants were approached through the mailing lists of concerned departments/faculties and professional networks. The target participants have been lecturers in any courses (theoretical and practical courses) related to life science at higher education institutions. The names of these institutions and participants were anonymized for confidentiality. The characteristics of the participants are described in Table 2.

Table 2. The Characteristics of Respondents in the Second Phase

Characteristics (n=27)		Frequency (n)	Percent (%)
Experience	<10 years	10	37.0
	>10 years	17	63.0
Education	PhD	19	70.4
	MSc	8	29.6
Gender	Male	8	29.6
	Female	19	70.4
Position	Lecturer	19	70.4
	Lecturer and administrator	8	29.6

To ensure the validity of the framework, this study involved a comprehensive review process that included document analysis, semi-structured interviews, and iterative revisions based on expert feedback. In fact, this survey aimed to test the validity of the proposed framework with established quality assurance standards such as AUN-QA and QM by determining the levels of importance as perceived by the instructors. For reliability, we calculated Cronbach's alpha to assess the internal consistency of the survey items, ensuring that the results accurately reflect the importance of each requirement (0.917). This rigorous approach guarantees that the findings are both valid and reliable, providing a strong foundation for the proposed quality assurance framework.

Data Analysis

For the first phase, after interviewing, the first author read the transcripts and classified the comments into four categories according to PDCA. A deductive analysis approach was used, guided by a synthesized framework incorporating both AUN-QA and QM requirements and criteria. The coding process involved identifying and categorizing data based on predefined themes derived from these frameworks. Relevant transcripts were then translated from the original language (Vietnamese) to English by the first author. To ensure the validity of the translation, a back-translation process was implemented using an AI translation tool, and then independently translated back to Vietnamese using the AI tool by the second author who reviewed the English translations to verify the appropriateness of the analysis and provide additional clarification until a consensus was reached. Any discrepancies were discussed and resolved to maintain accuracy. Besides, the first author analyzed and mapped the AUN-QA framework and quality matter rubric to select the proper requirements for course quality. The second author reviewed the requirements chosen. Two authors discussed and modified the requirements until a consensus was reached. This iterative process helped ensure that the analysis was thorough and that the derived themes accurately reflected the qualitative data.

For the second phase, respondents were designated as Lec.1 to Lec.27 to ensure their anonymity. The data were processed and analyzed through a descriptive approach. Each indicator of the survey was presented as mean and standard deviation (SD). The Mann-Whitney test was used to compare groups.

Findings

Lecturers' Perception of Course Quality Assurance

To be consistent with our results, we categorized interviewees' responses based on four steps of the PDCA approach. The briefer quotations from quality assurance expert (E), senior lecturer (S), and young lecturer (Y) responding were selected, translated, and presented to illustrate each step.

Plan Step

The interviewees said it is necessary to identify course learning outcomes and map them with program outcomes. The needs of stakeholders can be used to develop the course outcomes, such as recruiters and students. Instructors have to write course syllabi at this stage and check the availability of resources. The instructor E mentioned *"Must consider program outcomes. What are current program outcomes…how a course involves helping students achieve program outcomes…."* The instructor S emphasized that *"…a new course will teach in which phase of the curriculum – fundamental course or major course…"* and the instructor Y focused on the prerequisite courses *"… in the course syllabus, it is needed to identify the prerequisite course and post course to ensure that a new course is logical and beneficial for the learner…."*

Do Step

People, processes, and facilities are critical to implementing the course. People include the quality of a lecturer, teaching assistant, and support staff. The process can be viewed as a constructive alignment between the learning process, learning assessment, learning and teaching approaches, and learning outcomes. The facility is classified as a classroom, laboratory, and learning management system to support learners. In addition, learning assessment was stressed as a critical requirement. The instructor E mentioned *"…even if operating the online or face-to-face program, we need to care about people, process and facility and other supporting elements."* Instructors must consider assessing students' learning pros and cons between multiple choice questions and essays.

The instructor S stated *"How to assess each learning outcome and assess student learning. It is necessary to apply formative assessment to follow student's learning properly, multiple choice questions can be graded easily, but it is hard to evaluate students' thinking such as logical thinking…."* The instructor Y also mentioned, *"Quality of academic staff, facilities; the classroom will provide influent quality of course […] learning assessment is also essential to recognize how student achieve learning outcomes…."* In addition, the young lecturer stressed other factors affecting the course's quality, including learners' attitudes and motivation and the teacher's responsibility/enthusiasm in developing and implementing the course.

Check Step

Both E and S suggested that it is necessary to review the course's quality regularly by assessing teaching and learning with the course syllabus. The instructor E said that *"We need to check/evaluate the teaching procedure and compare it with the course syllabus regularly. Is it suitable or not? And propose the improvement plan…."* In addition, the instructor S mentioned *"it is easy to control the whole learning outcomes, but it is hard to control each learning outcome. To ensure that various assessments were regularly applied to follow the learning process (formative assessment)."*

Act Step

The instructor E was the only interviewee who raised concerns regarding continuous improvement during and after the implementation. E said that *"…To improve the course, we can view it into two aspects: (1) improve during the course, (2) improve after the course for the next semester…."* In addition, E emphasized the alignment between development, implementation, and course improvement to ensure the sustainability of quality. One respondent suggested the PDCA approach controls the rate of the system. The instructor E also mentioned *"If the operation does not align with design, it cannot control the course quality. If we do not have the checking and reviewing system, the quality assurance is not sustainable, and we do not know the areas that need improvement…."*

After the initial analysis based on the three interviewees was complete, we learned that some comments from lecturers in the second phase were also helpful and may add to our insightful understanding of concerns in the Act step. So, we considered them and reported their suggestions here. They mentioned other attributes that affect the course quality assurance, including student motivation, student capacity (student background and prerequisite knowledge), and quality assurance implication. Lecturers are concerned about the learners' attitudes and academic background because these attributes can affect students' performance and learning outcomes. The Lec.13 wrote, *"…not only control/manage the output, but it also needs to manage student input systematically (quality of student to learn a subject)."* The Lec.17 mentioned *"Factors that influence students' motivation in education: class and curriculum structure, teacher behavior and personality, teaching methods, parental habits and involvement, family issues and instability, peer relationships, learning environment, assessment."*

Requirements for Quality Assurance at the Course Level

Researchers analyzed and benchmarked the AUN-QA assessment framework, QM Rubric. The first author selected requirements from AUN-QA and the Quality Matter Rubric, which can be applied to ensure the quality of a course. In the AUN-QA framework, the author decided the proper requirements based on the following: (a) lecturers can involve and control the process directly; (b) Plan – Do – Check – Act cycle can be fulfilled. Some AUN-QA requirements were selected and modified, such as: "The program to show that the expected learning outcomes for all courses are appropriately formulated and aligned to the program's expected learning outcomes (AUN-QA, requirement 1.2)"; "The teaching and

learning activities are shown to promote learning, learning how to learn, and instilling in students a commitment for life-long learning (e.g., commitment to critical inquiry, information-processing skills, and a willingness to experiment with new ideas and practices) (AUN-QA, requirement 3.4)"; "A variety of assessment methods are shown to be used and are shown to be constructively aligned to achieving the expected learning outcomes and the teaching and learning objectives (AUN-QA, requirement 4.1)"; "The assessment methods are shown to include rubrics, marking schemes, timelines, and regulations, and these are shown to ensure validity, reliability, and fairness in assessment (AUN-QA, requirement 4.4)".

The 29 selected requirements from the AUN-QA framework were mapped with a QM rubric. The desired requirements and mapping results are presented in Appendix 2. In the next step, the selected requirements were adopted relevant to the course based on the lecturers' perceptions about the quality of the course. The first version of the quality assurance framework includes ten criteria (learning outcomes, structure and content, instructional method, learning assessment, course technology, instructional material, learner support, quality of instructor and staff, output and evaluation, and implementation process).

The second author reviewed the proposed criteria and requirements. Two authors discussed and combined similar requirements. In addition, the instructional material and course technology were combined as instructional material. The implementation process was removed because this criterion was integrated with other criteria. The second quality assurance version was created, including eight criteria (learning outcomes, structure and content, instructional approaches, learning assessment, instructional materials, learner support, personnel, output, and course evaluation) with 25 requirements proposed in Table 3. In this study, we took the written description of each requirement from its original source (either AUN-QA or QM) with minor revisions.

Table 3. The Description of the Eight Criteria and 25 Requirements

Criteria	Code	Requirement	Reference
1. Learning outcomes	1.1	The course outcomes are designed to align with the program's expected outcomes, ensuring that lesson outcomes correspond directly with the overarching course objectives.	AUN-QA 1.2
	1.2	Both lesson and course outcomes are quantifiable and articulated with clarity.	QM 2.1, 2.2, 2.3
	1.3	Outcomes cover a broad spectrum of skills, from general competencies such as communication and problem-solving to specific knowledge pertinent to the discipline of study.	AUN-QA 1.3
2. Structure & content	2.1	Course details are thoroughly outlined, current, accessible, and communicated to all relevant parties, encompassing elements like the course title, prerequisites, desired outcomes, methodologies for instruction and evaluation, along with a detailed syllabus and lesson plans.	AUN-QA 2.1
	2.2	The course is organized and progresses logically from basic to more advanced topics, ensuring a coherent integration of content.	AUN-QA 2.5
3. Instructional approaches (teaching & learning)	3.1	Educational activities are designed to enhance learning, foster an environment conducive to learning how to learn, and encourage a lifelong pursuit of knowledge, emphasizing critical thinking, the ability to process information, and openness to new concepts.	AUN-QA 3.4
	3.2	The course offers interactive learning experiences that facilitate active engagement.	AUN-QA 3.3
4. Learning assessment	4.1	A diverse array of evaluative techniques is employed, all strategically chosen to support the realization of intended learning outcomes and instructional goals.	AUN-QA 4.1
	4.2	Policies on evaluation and the right to appeal assessments are clearly defined, communicated, and uniformly enforced.	AUN-QA 4.2
	4.3	Evaluation strategies such as scoring guides, criteria, schedules, and rules are implemented to ensure assessments are valid, reliable, and fair.	AUN-QA 4.4
	4.4	Timely feedback is provided following student evaluations.	AUN-QA 4.6

Table 3. Continued

Criteria	Code	Requirement	Reference
5. Instructional materials	5.1	Adequate physical resources, including technology and materials necessary for course delivery, are available.	AUN-QA 7.1
	5.2	Instructional materials play a crucial role in meeting the defined learning goals.	QM 4.1
	5.3	The application of instructional resources in relation to the completion of learning tasks is explicitly detailed.	QM 4.2
	5.4	Academic honesty is upheld through the proper accreditation and authorization of educational materials.	QM 4.3
	5.5	A variety of teaching materials is utilized to support independent and continuous learning.	QM 4.5
6. Learner support	6.1	Systems are in place for the effective monitoring of student progress, academic performance, and workload, with regular recording and oversight. Feedback and necessary adjustments are provided as needed.	AUN-QA 6.1
	6.2	Guidance provided within the course connects students with academic support facilities and resources offered by the institution, aiding in their success.	QM 7.2
	6.3	Access to policies regarding course appeals, instruction, and assessments is ensured.	AUN-QA 4.2
	6.4	Information on data and privacy protection is made available to learners.	QM 6.4
7. Personnel (academic staff, supervisor/stake holders)	7.1	The workload of faculty and staff is evaluated and tracked to enhance educational quality.	AUN-QA 5.2
	7.2	Assignments to academic and other staff are made based on their qualifications, experiences, and capabilities.	AUN-QA 5.4
8. Output and improvement	8.1	Data is collected and analyzed to directly demonstrate the achievement of course objectives, with continuous monitoring in place.	AUN-QA 8.4
	8.2	The satisfaction of all stakeholders is assessed, tracked, and used as a benchmark for ongoing improvements.	AUN-QA 8.5
	8.3	The methods and processes of student evaluation are regularly revisited and refined to remain aligned with industry demands and learning expectations.	AUN-QA 4.7

Level of Importance of Proposed Requirements

Each requirement was analyzed at an important level by using an online survey. The survey included a Likert scale for the level of importance, open-ended questions for comments or suggestions in each requirement, and quality assurance of course. The first author sent the invitation email to lecturers in the professional network, and a total of 29 participants responded to the survey, with 27 submitting a completed survey. The following result was analyzed from the responses of 27 participants. The mean for each requirement was calculated. Table 4 presents the descriptive statistics for the level of importance of all requirements. As the results show, 19 requirements have a mean value over 4.0 (very important and absolutely essential), and the mean score of 6 requirements is between 3.5 and 4.0 (average importance). Most requirements related to learning outcomes (1.1, 1.2, 1.3), structure and content (2.1, 2.2), instructional approach (3.2), learning assessment (4.1, 4.2, 4.3, 4.4), instructional materials (5.1, 5.2, 5.4), learner support (6.1, 6.3), personnel (7.2), output & improvement (8.1, 8.2, 8.3) are considered very important (over than 4.0). Instructional material (5.3, 5.5), learner support (6.2, 6.4), and personnel (7.1) are considered less important than other criteria.

Table 4. The Descriptive Statistics About the Level of Importance of Proposed Requirements

Descriptive Statistics						
Code	N	Minimum	Maximum	Mean	Std. Deviation	Level of importance
1.1	27	3.00	5.00	4.63*	0.56	absolutely essential
1.2	27	3.00	5.00	4.59*	0.57	absolutely essential
1.3	26	3.00	5.00	4.31	0.84	very important
2.1	27	4.00	5.00	4.59*	0.50	absolutely essential
2.2	27	3.00	5.00	4.41*	0.64	absolutely essential
3.1	27	2.00	5.00	3.96	0.85	very important

Table 4. Continued

			Descriptive Statistics			
Code	N	Minimum	Maximum	Mean	Std. Deviation	Level of importance
3.2	27	3.00	5.00	4.19	0.74	very important
4.1	27	3.00	5.00	4.11	0.80	very important
4.2	27	3.00	5.00	4.37*	0.63	absolutely essential
4.3	27	3.00	5.00	4.48*	0.64	absolutely essential
4.4	27	3.00	5.00	4.15	0.72	very important
5.1	27	3.00	5.00	4.11	0.80	very important
5.2	27	2.00	5.00	4.15	0.77	very important
5.3	26	2.00	5.00	3.81	0.80	very important
5.4	27	3.00	5.00	4.30*	0.61	absolutely essential
5.5	27	2.00	5.00	3.52*	0.80	average importance
6.1	27	3.00	5.00	4.07	0.73	very important
6.2	26	3.00	5.00	3.85	0.61	very important
6.3	26	3.00	5.00	4.12	0.82	very important
6.4	25	1.00	5.00	3.52*	1.08	average importance
7.1	27	1.00	5.00	3.96	0.98	very important
7.2	27	2.00	5.00	4.15	0.82	very important
8.1	27	3.00	5.00	4.00	0.73	very important
8.2	26	3.00	5.00	4.12	0.65	very important
8.3	26	3.00	5.00	4.15	0.78	very important

* : the mean score is significantly greater or less than 4.0, with a significance level of 95%

The requirements have a mean value of less than 4.0, and its comments are described in Table 5. Although the requirements have a mean score of less than 4.0, lecturers provided their concerns to clarify why they assessed at that level. For example, in requirement 3.1, lecturers explained that lifelong learning is essential, but it is hard to implement and evaluate. The requirements 5.3 and 5.5, lecturers think that it is necessary to provide the primary learning materials, and students should learn how to search for learning materials. By following the level important, lecturers' suggestions, all requirements are kept in the framework to use as the guideline for course development, implementation, and improvement.

Table 5. The Comments for the Average Importance Requirements

Code	Mean ± SD	Requirement description and its comments (if any)
5.5	3.52 ± 0.8	A variety of teaching materials is utilized to support independent and continuous learning. *"Should instruct students on searching materials and encourage independent exploration."* *"Provide the primary materials, the focus of the course, and help students have a base of knowledge before accessing other sources, avoiding confusion in the process of receiving information."* *"Providing two to three essential and legal materials is suitable for students learning."*
6.4	3.52 ± 1.08	Information on data and privacy protection is made available to learners. *"Should be taught as a separate subject; teaching this skill may not be appropriate for many subjects, causing distraction from the learning content within the subject's limited time."* *"About protecting data and privacy, there should be a separate course to guide students instead of introducing in every subject"*

Senior and Junior Lecturers' Perception

Lecturers' experience and background could affect teaching effectiveness, so the perception of senior and junior lecturers was analyzed in this study. The Mann-Whitney test was used to compare two educational backgrounds and experience groups. There is no significant difference between groups of educational backgrounds and expertise in most requirements, except requirements 3.1, 3.2, and 6.4. The results are presented in Table 6.

Table 6. The Difference Between Groups of Educational Background and Teaching Experience

	Grouping Variables		
	Teaching Experience (>10 years; <10 years)		Education background (PhD vs MSc.)
Requirements' code	3.1	3.2	6.4
Mann-Whitney U	36.500	26.000	29.000
Wilcoxon W	91.500	81.000	57.000
Z	-2.581	-3.201	-2.138
Asymp. Sig. (2-tailed)	0.010	0.001	0.032
Exact Sig. [2*(1-tailed Sig.)]	.013[b]	.002[b]	.041[b]

b. Not corrected for ties. 3.1, 3.2: requirements in instructional approaches. 6.4: data and privacy

The junior and senior lecturers rated the important level differentially on requirement 3.1 (*Educational activities are designed to enhance learning, foster an environment conducive to learning how to learn, and encourage a lifelong pursuit of knowledge, emphasizing critical thinking, the ability to process information, and openness to new concepts.*) The senior lecturers considered this requirement very important (the mean value exceeds 4.0), whereas the junior lecturer rated it less important. The lecturers with a Ph.D. degree considered data privacy (requirement 6.4) more important than the other group.

Discussion

Quality Criteria for a Course

Quality in higher education is an emerging field, and the quality of courses involved in the academic program will promote total quality. This study provided a systematic approach to ensure the course quality from development to implementation and improvement based on the PDCA cycle. The 25 requirements were adopted from the well-defined quality assessment frameworks (AUN-QA, quality matter rubric) and interviewing university lecturers. All criteria were defined systematically, which course designers and instructors can apply to develop, deliver, and improve any course. Our findings confirm the importance of eight criteria, especially learning outcomes, course content, instructional approach, learning assessment, and personnel. Figure 1 shows the mapping between eight criteria and the PDCA cycle.
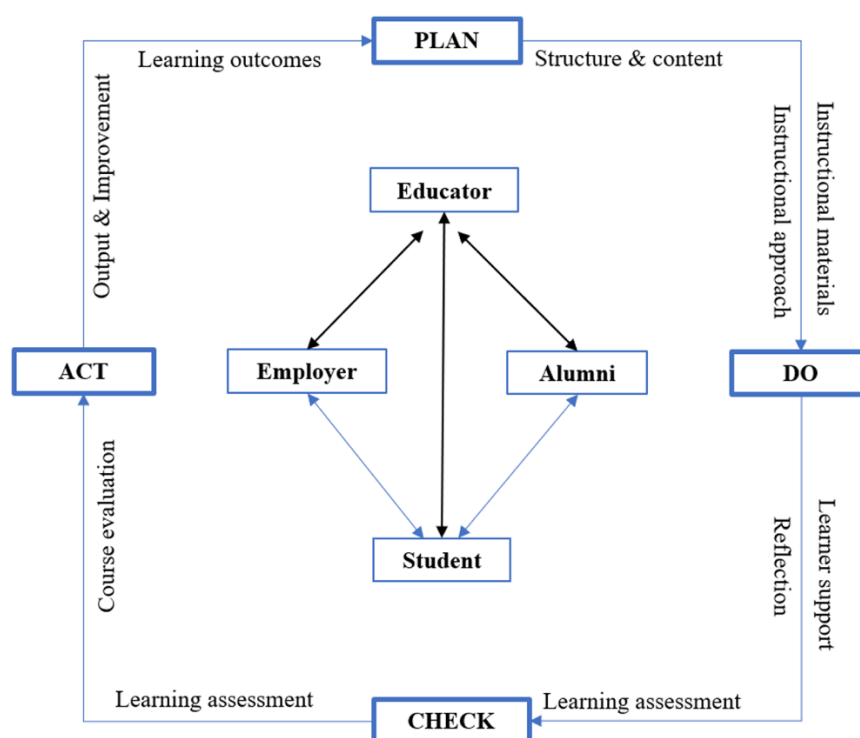

Figure 1. The Mapping of Proposed Criteria in the PDCA Approach

The study results were analyzed and interpreted by following the PDCA cycle which is used widely to improve education continuously (O. Belash et al., 2015) and offers management action and feedback mechanisms (O.Y. Belash & Ryzhov, 2018). The mapping reflected that the proposed requirements could be suitable for controlling the course quality in different stages. In addition, the suggested criteria not only cover all course design standards which were mentioned by Baldwin et al. (2018) but also provide the framework and explanation for course implementation and continuous

improvement. Baldwin et al. outlined key principles of course design which encompass: (a) the accessibility of objectives; (b) user-friendly navigation; (c) the employment of technology to boost student engagement and facilitate learning; (d) the encouragement of student interaction; (e) the use of communication and activities to foster a sense of community; (f) the clear listing of instructor contact details; (g) the establishment of clear expectations for communication and participation quality; (h) the availability of grading rubrics for assignments; (i) the alignment of assessments with course objectives; (j) the provision of links to support services offered by the institution; (k) the inclusion of provisions for students with disabilities; (l) the explicit mention of course policies related to expected behaviors.

Following the quality assurance framework, the course designers and instructors had a helicopter view when developing the new courses. Furthermore, educators utilized the framework to enhance and adjust the existing courses within the curriculum continuously. Furthermore, the importance of the proposed requirements was informed by lecturers and categorized into three main groups (absolutely essential, very important, and average importance). Thus, lecturers can recognize the priority requirements that they can be controlled and engaged in designing, implementing, and improving the course. The average importance requirements could be the aspects that are beyond the lecturer's control or focus. Although instructional materials and learner support dimensions were assessed as less important than others, those requirements still need to be considered and prepared carefully. Lecturers emphasized the essential and legal learning resources and suggested that students should be trained to find necessary learning materials. This is similar to Bušljeta (2013) teaching and learning resources must be used effectively to encourage active learning.

This framework is also useful for technology-enhanced learning as it can be applied in developing, implementing, and proving courses (offline or online, blended learning courses). In addition, it clearly states the personnel resources (especially academic staff) who have critical roles in learner support areas and are the most valuable element in managing, implementing, and evaluating learning activities in open and distance learning (Darojat et al., 2015). In addition, Perris and Mohee (2020) suggested seven areas of the quality assurance rubric for blended learning, including content, instructional design, course structure, student support, technology/media, assessment, quality assurance, and evaluation; those areas included in the eight criteria of the proposed framework. Although technology or media is not stated as an area or criterion, it is mentioned in the instructional materials and learner support and has constructive alignment with other standards. Thus, academic staff and administration can use this framework to manage the quality of online, blended learning, or face-to-face courses.

The Difference Between Junior and Senior Lecturers in the Quality of Teaching

The junior and senior lecturers rated the important level differentially on the teaching and learning activities (requirement 3.1), as the senior lecturers considered this requirement very important, whereas the junior lecturer rated it less important. Perhaps the younger lecturers in the early career stages focus more on course content. Researchers have identified a variance in how senior and junior academics view the criteria for evaluating teaching effectiveness. Specifically, the junior scholars did not consider the design and planning of learning activities as important criteria (Yunus et al., 2020). In this study, data privacy (requirement 6.4) was rated less important than other requirements in this study. Lecturers mentioned that this requirement should be trained at the institutional level. In addition, recognizing the differences between educational background and experience groups can provide a recommendation for quality assurance and teacher professional development. This finding should be considered carefully in the lecturer's training.

Conclusion

The ASEAN University Network – Quality Assurance (AUN-QA) framework has been accepted for assessing program and institution quality. In general, assessment or accreditation procedures can bring various benefits to programs and universities, but there are still limited improvements in teaching and learning (Pham, 2018). The courses are an essential part of the program, but instructors cannot handle the broader criteria and evidence requested by the AUN-QA framework. The Quality Matter (QM) rubric is a proper approach to evaluate the online or blended courses so that some requirements, such as course technology, accessibility, etc., need to be modified for other courses. The present study systematically investigated the criteria and requirements for course quality based on the AUN-QA framework the QM rubric. The results indicate that learning outcomes, structure and content, instructional approaches, learning assessment, learner support, staff, and output are essential to ensure quality. In addition, those criteria fit with the Plan-Do-Check-Act (PDCA) cycle theory to promote continuous improvement in education.

Recommendations

For further research, we recommend extending the background of participants to investigate the effectiveness of the proposed quality assurance framework. It is also necessary to explore the administration representatives' and students' perceptions of course quality assurance and how the proposed framework affects their learning achievement.

Limitations

As a limitation, this study focuses on the perspectives of Vietnamese lecturers; therefore, future research could explore participants' perceptions from other countries and fields to widen the use of the proposed quality assurance framework at the course level. In addition, this study did not investigate the perception of administration representatives and students.

Ethics Statements

This study is a part of the Ph.D. research project of the first author, which received ethical approval from the IRB committee of Mahidol University (COA. No. 2022/02-017).

Authorship Contribution Statement

Bui: Conceptualization, design, analysis, and writing. Yasri: Conceptualization, review, supervision, and final approval.

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Appendix 1

Table A1. Interview Protocol for Quality Assurance

Session	Questions
Introduction	• Ask for recording permission and oral consent. • Introduce the interview purpose • Ask for interviewees background and personal information (experience, education, occupation, position, etc.)
Course development	• Which factors have to be considered in new course development?
Course quality assurance	• How to ensure the quality of the course?

Appendix 2

Table A2. Mapping Selected Requirements from the AUN-QA Framework with Quality Matter Criteria

AUN-QA Framework (version 4.0)		Quality matter rubric	
Criteria	Selected requirements from the AUN-QA framework (version 4.0)	Criteria	Description
1. Expected learning outcomes	1.2. The program to show that the expected learning outcomes for all courses are appropriately formulated and aligned to the expected learning outcomes of the program.	**2. Learning Objectives (Competencies)**	2.1 The course learning objectives, or course/program competencies, describe outcomes that are measurable. 2.2 The module/unit-level learning objectives or competencies describe outcomes that are measurable and consistent with the course-level objectives or competencies. 2.3 Learning objectives or competencies are stated clearly, are written from the learner's perspective, and are prominently located in the course. 2.4 The relationship between learning objectives or competencies and learning activities is clearly stated. 2.5 The learning objectives or competencies are suited to the level of the course.
	1.3. The program to show that the expected learning outcomes consist of both generic outcomes (related to written and oral communication, problem-solving, information technology, teambuilding skills, etc.) and subject-specific outcomes (related to knowledge and skills of the study discipline).		
	1.5. The program shows that the students achieve the expected learning outcomes by the time they graduate.		
2. Program structure and content	2.1. The specifications of the program and all its courses are shown to be comprehensive, up-to-date, and made available and communicated to all stakeholders.		
	2.3. The design of the curriculum is shown to include feedback from stakeholders, especially external stakeholders.		
	2.4. The contribution made by each course in achieving the expected learning outcomes is shown to be clear.		
	2.5. The curriculum to show that all its courses are logically structured, properly sequenced (progression from basic to intermediate to specialised courses), and integrated.		
	2.7. The program shows that its curriculum is reviewed periodically following an established procedure and that it remains up-to-date and relevant to the industry.		

Table A2. Continued

AUN-QA Framework (version 4.0)		Quality matter rubric	
Criteria	**Selected requirements from the AUN-QA framework (version 4.0)**	**Criteria**	**Description**
3. Teaching and learning approach	3.2. The teaching and learning activities are shown to allow students to participate responsibly in the learning process	**5. Learning Activities and Learner Interaction**	5.1 The learning activities promote the achievement of the stated learning objectives or competencies. 5.2 Learning activities provide opportunities for interaction that support active learning. 5.3 The instructor's plan for interacting with learners during the course is clearly stated. 5.4 The requirements for learner interaction are clearly stated
	3.3. The teaching and learning activities are shown to involve active learning by the students		
	3.4. The teaching and learning activities are shown to promote learning, learning how to learn, and instilling in students a commitment to *life-long learning* (e.g., commitment to critical inquiry, information-processing skills, and a willingness to experiment with new ideas and practices).		
	3.5. The teaching and learning activities are shown to inculcate in students, new ideas, creative thought, innovation, and an entrepreneurial mindset		
	3.6. The teaching and learning processes are shown to be continuously improved to ensure their relevance to the needs of the industry and are aligned with the expected learning outcomes		
4. Student assessment	4.1. A variety of assessment methods are shown to be used and are shown to be constructively aligned to achieving the expected learning outcomes and the teaching and learning objectives.	**3. Assessment and Measurement**	3.1 The assessments measure the achievement of the stated learning objectives or competencies. 3.2 The course grading policy is stated clearly at the beginning of the course. 3.3 Specific and descriptive criteria are provided for the evaluation of learners' work, and their connection to the course grading policy is clearly explained. 3.4 The assessments used are sequenced, varied, and suited to the level of the course. 3.5 The course provides learners with multiple opportunities to track their learning progress with timely feedback.
	4.2. The assessment and assessment-appeal policies are shown to be explicit, communicated to students, and applied consistently		
	4.4. The assessment methods are shown to include rubrics, marking schemes, timelines, and regulations, and these are shown to ensure validity, reliability, and fairness in assessment.		
	4.5. The assessment methods are shown to measure the achievement of the expected learning outcomes of the program and its courses.		
	4.6. Feedback on student assessment is shown to be provided in a timely manner.		
	4.7. The student assessment and its processes are shown to be continuously reviewed and improved to ensure their relevance to the needs of industry and alignment to the expected learning outcomes		

Table A2. Continued

AUN-QA Framework (version 4.0)		Quality matter rubric	
Criteria	**Selected requirements from the AUN-QA framework (version 4.0)**	**Criteria**	**Description**
5. Academic staff	5.2. The program shows that staff workload is measured and monitored to improve the quality of education, research, and service.		
	5.4. The program shows that the duties allocated to the academic staff are appropriate to qualifications, experience, and aptitude		
6. Student support service	6.3. An adequate system is shown to exist for student progress, academic performance, and workload monitoring. Student progress, academic performance, and workload are shown to be systematically recorded and monitored. Feedback to students and corrective actions are made where necessary	**7. Learner Support**	7.1 The course instructions articulate or link to a clear description of the technical support offered and how to obtain it. 7.2 Course instructions articulate or link to the institution's accessibility policies and services. 7.3 Course instructions articulate or link to the institution's academic support services and resources that can help learners succeed in the course. 7.4 Course instructions articulate or link to the institution's student services and resources that can help learners succeed.
	6.4. Co-curricular activities, student competition, and other student support services are shown to be available to improve learning experience and employability		
	6.6. Student support services are shown to be subjected to evaluation, benchmarking, and enhancement		
7. Falicity and infrastructure	7.1. The physical resources to deliver the curriculum, including equipment, material, and information technology, are shown to be sufficient.	**4. Instructional Materials**	4.1 The instructional materials contribute to the achievement of the stated learning objectives or competencies. 4.2 The relationship between the use of instructional materials in the course and completing learning activities is clearly explained. 4.3 The course models the academic integrity expected of learners by providing both source references and permissions for use of instructional materials. 4.4 The instructional materials represent up-to-date theory and practice in the discipline. 4.5 A variety of instructional materials is used in the course.
	7.2. The laboratories and equipment are shown to be up-to-date, readily available, and effectively deployed		
	7.3. A digital library is shown to be set-up, in keeping with progress in information and communication technology.		
8. Output and outcome	8.4. Data are provided to show directly the achievement of the program outcomes, which are established and monitored		
	8.5. Satisfaction level of the various stakeholders are shown to be established, monitored, and benchmarked for improvement		

Table A2. Continued

AUN-QA Framework (version 4.0)		Quality matter rubric	
Criteria	**Selected requirements from the AUN-QA framework (version 4.0)**	**Criteria**	**Description**
		1. Course overview and introduction	1.1 Instructions make clear how to get started and where to find various course components. 1.2 Learners are introduced to the purpose and structure of the course. 1.3 Communication expectations for online discussions, email, and other forms of interaction are clearly stated. 1.4 Course and institutional policies with which the learner is expected to comply are clearly stated within the course, or a link to current policies is provided. 1.5 Minimum technology requirements for the course are clearly stated, and information on how to obtain the technologies is provided. 1.6 Computer skills and digital information literacy skills expected of the learner are clearly stated. 1.7 Expectations for prerequisite knowledge in the discipline and/or any required competencies are clearly stated. 1.8 The self-introduction by the instructor is professional and is available online. 1.9 Learners are asked to introduce themselves to the class
		6. Course Technology	6.1 The tools used in the course support the learning objectives or competencies. 6.2 Course tools promote learner engagement and active learning. 6.3 A variety of technology is used in the course. 6.4 The course provides learners with information on protecting their data and privacy
		8. Accessibility and Usability	8.1 Course navigation facilitates ease of use. 8.2 The course design facilitates readability. 8.3 The course provides accessible text and images in files, documents, LMS pages, and web pages to meet the needs of diverse learners. 8.4 The course provides alternative means of access to multimedia content in formats that meet the needs of diverse learners. 8.5 Course multimedia facilitate ease of use. 8.6 Vendor accessibility statements are provided for all technologies required in the course.