

AUN-QA Remote Assessment of the BSChE Program: UPLB CEAT Experience

Myra G. Borines^{a*}, Monet Concepcion Maguyon-Detras^a, Jewel A. Capunitan^b
and Rowena B. Carpio^b

^a Professor, ^b Associate Professor, Chemical Engineering Department, College of Engineering and Agro-industrial Technology, University of the Philippines Los Baños

*mgborines@up.edu.ph

Highlights

- External Quality Assurance assessment in engineering education focused on the continuous improvement of the quality assurance system being implemented by the program.
- A structured and functional internal quality assurance system in the university is vital in remote assessment.
- Feedback from stakeholders are important to enhance the quality of education.

Abstract

Quality Assurance in engineering education is an important aspect in the systematic monitoring and evaluation of a degree program, its resources, and output. In the ASEAN region, the ASEAN University Network (AUN) works towards educational capacity building by conducting programs and activities for higher education institutions to achieve global standard. Through its AUN Quality Assurance (AUN-QA), a regional style accreditation system is being implemented among network of universities in ASEAN countries.

As part of the University of the Philippines' (UP) mandate and thrust to guarantee the same level of quality in education, research and public service in all its constituent units, the University of the Philippines Los Baños (UPLB) BS Chemical Engineering (BSChE) program successfully completed the AUN-QA Programme Remote Assessment last October 2020. Using the AUN-QA's eleven standardized criteria, the BSChE program was assessed in terms of teaching, learning, and outcome-based education (OBE) on a detailed examination of curricula, structures, resources and effectiveness of the program. The assessment also provided a platform for the stakeholders of the program to discuss issues on the quality of education and to give their feedback on how to improve the University's processes, systems, facilities and curriculum, among others. This quality assessment aimed to determine if the BSChE program meets generally accepted quality standards in higher education. This paper highlights the quality assurance initiatives being undertaken by the University, College and the Chemical Engineering department that contributed to the success of the assessment as well as the challenges and opportunities encountered during the remote assessment. The result of the assessment provides the BSChE program and the University a closer look at its current quality assurance system including its strengths, weaknesses, and areas for improvement.

Key Words:

AUN-QA; quality assurance; expected learning outcomes; chemical engineering

1. Introduction

AUN-QA Network, a non-profit and non-governmental organization, was established as the ASEAN quality assurance network in higher education with the responsibility of promoting quality assurance in higher education institutions, raising academic standards and enhancing education, research, and service, and collaborating with both regional and international bodies for the benefit of the ASEAN community through the use of its policy and criteria (Pham et. al, 2020; Dolly et.al., 2020).

In an attempt to harmonize the framework for quality assurance in higher education within and outside ASEAN, AUN-QA developed the AUN-QA models for programme level assessment since 1998. These models cover three dimensions on quality of input, quality of process, and quality of output. This quality assurance framework supports the ASEAN Economic Community and promotes cross-border mobility for students and faculty members and the internationalization of higher education (AUN, 2015; ASEAN, 2015). AUN-QA program level accreditation allows higher education institutions in ASEAN countries to move beyond their national systems of institutional accreditation and integrate themselves into an ASEAN regional standard (Danielson et.al., 2016).

Based on empirical approach, AUN has been promoting, developing, and implementing quality assurance practices where quality assurance are verified, evaluated, improved, and shared (Paramono, et. al, 2018). AUN-QA pursues to create feasible internal quality assurance (IQA) systems within its members and other universities in ASEAN.

Quality assessment of the core academic functions of departments/institutes is part of the commitment of the University of the Philippines (UP) System to meet standards of academic excellence. Regular assessment of its academic programs is essential for self-improvement for national and global competitiveness. In 1999, the UP System Committee proposed a common standard for evaluating academic (degree-granting) units using the instrument called Academic Assessment System (AAS). In 2011, it was renamed as Internal Academic Assessment and Development System (iAADS). The University's knowledge development strategic plan is supported by the Office of the Vice-President for Academic Affairs (OVPA) through different mechanisms such as internal self-assessment and external quality certification/accreditation on the national, regional, and international levels (UP QA System, 2021).

The University of the Philippines Los Banos (UPLB) is one of the eight constituent universities (CUs) of UP. In line with UP's mandate and thrusts to guarantee the same level of quality in education, research and public service in all its constituent units, UPLB takes primary responsibility for ensuring quality in every program, operational systems, and services of the institution. The same responsibility for assuring quality is taken on in the individual colleges, units, and offices under UPLB.

While the internal assessment of programs in UP is regularly undertaken, the vision of UPLB is for all its colleges and schools to go through the process of external review of at least their programs. At present, seven UPLB academic programs were given AUN-QA certification including the BS Chemical Engineering (BSChE) (UPLB QA Office, 2020). In October 2020, the BSChE program successfully completed the AUN-QA Programme Remote Assessment based on the AUN-QA's eleven standardized criteria.

This paper highlights the quality assurance initiatives being undertaken by the University, college and the department that contributed to the success of the assessment of the BSChE program using the AUN-QA 11-point criteria as well as the challenges and opportunities encountered during the remote assessment.

2. AUN-QA Program Level Assessment

2.1 AUN-QA Assessment Model

The focus of the AUN-QA assessment at the programme level is on the quality of educational programmes based on the quality of input, quality of processes and quality of output. To improve QA practices among universities, AUN-QA has adopted the Plan-Do-Check-Act (PDCA) approach as shown in Figure 1 (AUN, 2020). AUN-QA accreditation is more system and process oriented while the student attainment of outcomes related to what students “know and can do” is not a focus. It is non-prescriptive; recommending areas for improvement rather than mandating solutions (AUN, 2015).

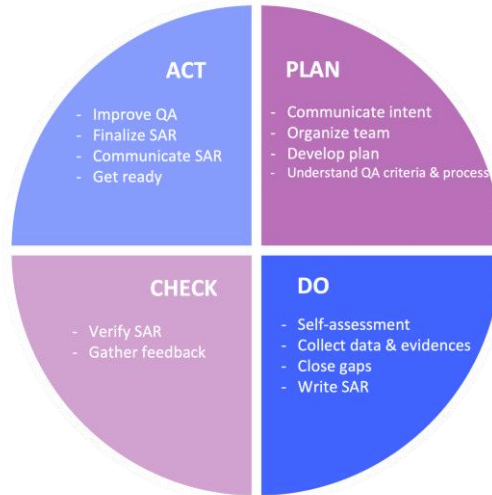


Figure 1. AUN-QA Approach to Self-assessment at Program Level (AUN, 2015).

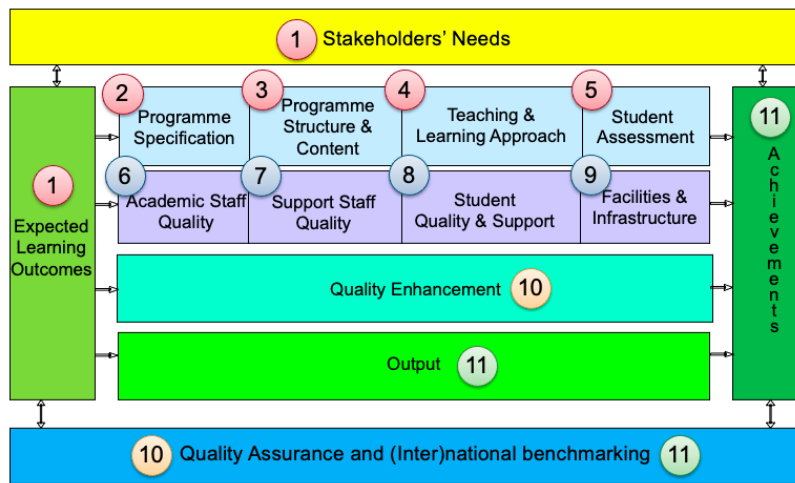


Figure 2. AUN-QA Model for Programme Level (Version 3.0) (AUN, 2015).

The AUN-QA model for programme level (version 3) has 11 criteria as shown in Figure 2. It starts with stakeholders’ needs which are then formulated into the expected learning outcomes which drive the programme. The first row in the middle of the model addresses the question of how the expected learning outcomes are translated into the programme; and how they can be achieved via teaching and learning

approach and student assessment. The academic and support staff; student quality and support; and facilities and infrastructure which are found in the 2nd row are considered to be the "input" into the process. In the third row, the quality enhancement of the programme covering curriculum design and development, teaching and learning, student assessment, quality of support services and facilities, and stakeholders' feedback are considered. The fourth row centers on the "output" of the programme including pass rates and dropout rates, the average time to graduate, employability of the graduates, research activities and stakeholders' satisfaction. The final column focuses on the achievements of the expected learning outcomes and the programme. The fulfillment of stakeholders' needs and the continuous improvement of the quality assurance system and benchmarking to seek best practices are where the model ends (AUN, 2015).

2.2 Aspects of Assessment Preparation

The preparation process for AUN-QA assessment requires an institution to become an AUN member or an associate member of the AUN-QA network. In addition, it must have at least three cohorts from the same programme at the time of application (AUN-QA, 2016). The institution sends one or more representatives to receive AUN-QA training on AUN-QA framework, criteria, and the requirements for the Self-Assessment Report (SAR). Programs working towards AUN-QA Assessment have to make a significant effort towards writing a SAR (Danielson et. al., 2016).

As the internationally recognized leading educational institution in the country, UP is a founding member and is one of the three Philippine universities in the ASEAN University Network (AUN), thus UP is eligible for AUN-QA assessment. UP recognizes that a quality assurance system will enable it to continuously enhance the quality and relevance of its academic programs. For this reason, the UP Quality Assurance System (UP QAS) is in place to assure the Filipino public as well as national and international stakeholders that UP programs and delivering units meet standards of academic excellence. UP QAS has two components: internal QA (IQA) and external QA (UP QA System, 2021).

In UP, the process of quality assurance comes in the form of IQA mechanisms that assures quality in management systems, administrative processes, instruction, research, and public service (UP System, 2011). All the academic units in UP undergo a periodic self-assessment through the Internal Academic Assessment and Development System (iAADS). It is a computerized system for online data entry, storage of data gathered from the quantitative and qualitative self-assessment. Through iAADS, a report can be generated automatically which can be used in subsequent academic self-assessments. It enables the department/institute to benchmark itself with other departments/institutes within their college, CU, and across CUs.

The UPLB Quality Assurance Office (QAO) takes the primary responsibility for ensuring quality in every program, operational systems, and services to the institution. UPLB QAO has an advisory committee composed of the vice-chancellors with its Director as ex-officio chair. There are 11 appointed QA Officers from 9 colleges and 2 schools who are in charge of carrying out self-assessment reviews and ensuring that the policies and mandates of UPLB QAO are followed by the units (UPLB QA Office, 2020).

The College of Engineering and Agro-industrial Technology (CEAT) has established its QA committee at the college level composed of representatives from different units including a student representative to assess their academic, research, and extension services for quality assurance. In 2019, following the directive from the UP QAS, the degree programs in CEAT were tasked to prepare their SAR based on the AUN-QA criteria version 3 including the BS Chemical Engineering.

The BSChE program, under the Department of Chemical Engineering (DChE), is among the six (6) undergraduate engineering programs offered by CEAT. Its curriculum was revised from a five-year to a four-year program in 2018 in sync with the K to 12 Basic Education Program of the Philippines. Both the old and the new curricula conform to the program specifications per 2008 Commission of Higher Education (CHED) Memorandum Order (CMO) No. 23, and 2017 CMO No. 91, and by the Chemical Engineering Law of 2004 (Republic Act (RA) 9297). In both curricula, the educational objectives of the BSChE program were formulated based on UP's mandate as stated in RA 9500.

The assessment of the BSChE program under the AUN-QA is integral in achieving leadership and international status in chemical engineering education. The SAR covers five years of implementation of the BSChE program, which covered the period of 2nd semester Academic Year (AY) 2014-2015 to 1st semester of AY 2019-2020. Specifically, the evaluation period included the last three years of the implementation of the old five-year curriculum and two years of implementation of the new four-year curriculum. The process involved identification, collection, and analysis of evidence for each criterion.

The SAR of the BSChE program took eight (8) months to prepare which started in January 2020, following the directive of the CEAT Associate Dean, who also chairs the CEAT Continuing Quality Improvement (CEAT-CQI) committee. The DChE CQI committee formed SAR subteams to focus on specific assessment criteria. Workshops were conducted by the Department to evaluate and rate the findings/reports of the subteams using the diagnostic questions and the 7-point rating scale of the AUN-QA Guidelines. The reports were revised, compiled, and formatted accordingly. The initial draft of the BSChE SAR was submitted for review by the UPLB QAO. After a series of revisions, the BSChE SAR was finalized and submitted to AUN QA Secretariat in preparation for the online assessment in October 2020.

Both UP and UPLB have policies and directions to allocate resources to implement QA practices within the university. The assessment fee for the AUN-QA assessment of the BSChE program was provided by the UP System while UPLB allocated budget for the supplies and IT infrastructure to support the preparation of DChE for the online assessment.

The UPLB QAO coordinated with the different units within the university to facilitate the stakeholders' interview particularly that of university support staff and remote visits of the university facilities. The BSChE programme-in-charge coordinated with the AUN-QA Secretariat for the assessment itinerary, remote visit and interview requirements, technical specifications, virtual meeting details, readiness test and other concerns during the 5-day online assessment. DChE formed different committees which were assigned to be in charge of the activities in preparation for the online assessment.

2.3 Assessment and Evaluation Requirements

The BSChE program was assessed based on the 11-point criteria of the AUN-QA at the programme level which are grouped into programme, resources, and result, as discussed below. In each of the criteria, the QA practices and systems of the program were described in the SAR using the guidelines in the AUN-QA manual. Evidences were gathered and organized as appendices in SAR.

Programme assessment encompasses the first to fifth criterion. The first criterion tackled the formulation and development of the **expected learning outcomes (ELO)** of the BSChE program in relation to the inputs from stakeholders, alignment with the mission and vision of UPLB, CEAT, and DChE, and benchmarking with CHED standards. The second criterion on **programme specification** provided information regarding the BSChE program and course specifications which are being communicated to stakeholders in various platforms. The third criterion on **programme structure and content** focused on how the BSChE

curriculum was designed to achieve the ELO. In this criterion, the logical structure, sequencing, and integration of the different courses under the BSChE curriculum was shown in relation to the ELO. The fourth criterion on **teaching and learning strategy** discussed the alignment of the teaching and learning activities in each course to the ELO of the program. It also highlighted the incorporation of UP's educational philosophy in the BSChE program and the inclusion of GE courses for holistic learning to instill a national sense of responsibility. Various learning activities are also integrated in the program for students to become life-long learners and technopreneurs among others. The fifth criterion showed the constructive alignment of course-specific and final **student assessments** with the ELO.

The sixth to tenth criteria focus on the quality of inputs or resources. The **quality of academic staff** in terms of faculty profile, faculty development plan, core staffing pattern, trainings, research and public service, and promotion among others were presented in the sixth criterion. DChE consists of 22 full-time faculty members, 59% are PhD degree holders, with expertise in various fields of specialization. It has an established evaluation system for hiring, promotion, and tenure of faculty based on the UP guidelines, and its Faculty Development Plan. Faculty competencies are evaluated regularly through student and peer evaluation. The seventh criterion presented the **support staff quality**. DChE has six support staff: two administrative staff and four research, extension and professional staff (REPS). The information presented here includes guidelines on recruitment and selection for appointment, deployment and promotion of support staff; evaluation of the competencies of administrative staff based on the UP Strategic Performance Management System (SPMS); and semi-annual evaluation of the performance of support staff through the Individual Performance Commitment and Review (IPCR) for admin staff and REPS Service Record (RSR) for REPS. **Student quality and support** is evaluated in the eight criterion. It also provides information on the student intake policy and admission criteria being administered at the UP system level through the UP College Admission Test (UPCAT). The UPCAT is well-publicized, both on the UP websites and in various media nationwide. Policies on the admission of shiftees and transferees from UP constituent universities were also presented as well as system for student monitoring (i.e. student progress, academic performance, workload). The adequacy of **facilities and infrastructure** to support teaching and research was assessed in the ninth criterion. In this criterion, it was highlighted that there is a need for expansion to accommodate more students and to conduct more research projects. DChE's teaching and learning facilities are maintained and continually improved following the RA 9272, 2017 CMO No. 91 and Professional Regulation Commission (PRC) assessment. Learning resources are accessible to the faculty, staff, and students through libraries, free journal subscriptions, improved IT facilities, web portals, and free WiFi connectivity in UPLB. Environment, health and safety standards are also strictly implemented in coordination with the UPLB Office of the Vice-Chancellor for Community Affairs. Finally, the system for **quality enhancement** was presented and evaluated in the tenth criterion. The BSChE curriculum was designed and developed with inputs from different stakeholders through workshops and consultative meetings. The curriculum underwent various levels of evaluation and enhancement throughout the process before its approval by the UP President and the Board of Regents based on established UP guidelines. The teaching and learning process and student assessment are also continually improved through peer evaluation and Student Evaluation on Teacher (SET) which is conducted for each course every semester.

The **eleventh criterion** is about **outputs**. The pass rates, dropout rates, and average time to graduate are monitored by the CEAT Office of the College Secretary (OCS) for improvement. The OCS identifies common causes of delinquency to help formulate policies and create programs to improve student scholastic performance and graduation rate. Based on the recent tracer study, BSChE graduates have a high employability rate.

AUN-QA is using a systematic procedure to monitor the performance based on the submitted report and validated it through interviews with the stakeholders (Asilo, 2018). The 5-day remote assessment included the following activities: opening program, online interviews of stakeholders, remote site visits of university

and program facilities, and closing program (Figure 3). A series of interviews involving the Dean, Vice Dean, Department Chair, Faculty, University and Program Support Staff were conducted throughout the week. DChE also invited students, alumni, and employers as stakeholders for the interviews. Live streaming of the university facilities, such as the main library, sports facilities, health service facilities and others, was conducted, and their heads were interviewed about the services offered to students. The department and college facilities, including classrooms, department office, laboratories, CEAT Library, and CEAT Student Lounge, were also live-streamed. The assessors also gave initial feedback on their assessment during the closing program.

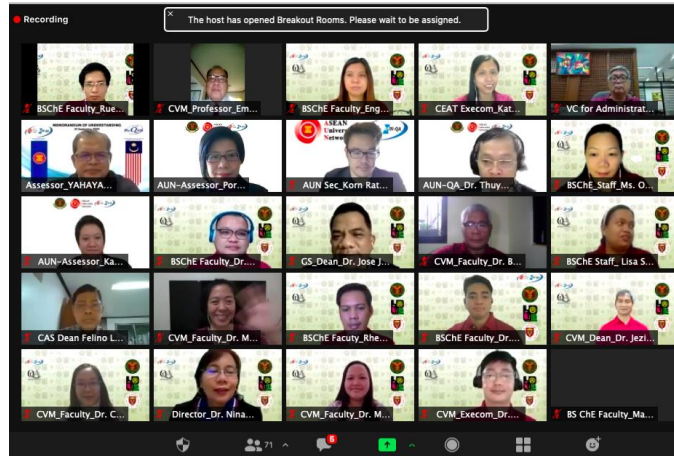


Figure 3. AUN-QA Remote Assessment of the UPLB BSChE program

3. Challenges and Lessons

Due to the current pandemic situation, the department encountered a major challenge in the logistics and technical preparation for the remote visit. This was overcome through the support of the University and the cooperation of stakeholders (students, alumni and employers). In addition, aside from BSChE, the Doctor of Veterinary Medicine (DVM) program of the College of Veterinary Medicine (CVM) was also assessed during that time, as per UPLB's practice to endorse at least two programs from different colleges to undergo AUN-QA. The units' combined resources and expertise led to the smooth preparation for the remote visit (virtual tour and livestreaming of university facilities) and successful remote assessment of both programs.

With regards to the results of the assessment, some relevant findings were pointed out that could help the department improve the BSChE program. First, the AUN-QA's requirements have tended to heavily rely on feedback from stakeholders to enhance the quality of education starting from the formulation of the program's learning outcome, curricular development, teaching and learning, student assessment, quality of academic and support staff and facilities. Structured feedback from the labor market, staff, students and alumni such as regular, ad-hoc, formal and informal surveys and feedback mechanisms via reports must be in place and part of the continuing quality improvement.

Also, while the new BSChE curriculum is OBE (outcome-based education)-based, knowledge and understanding of the academic staff on OBE should be enhanced. New courses in Innovationeering and Engineering Industry Research have been found to enhance the students' capability in innovation and real application in research. Modern teaching techniques are also recommended to be applied in the teaching and learning approach. The students-centered learning strategy must be reviewed to make it more effective. One of the strong points identified by the assessors is the high research outputs of the academic staff which enriched the training of students through the conduct of their thesis. Alumni of the program show their

appreciation of how their knowledge, laboratory, and soft skills are enhanced through their thesis. However, trainings and developments on innovation and entrepreneurship must be done to create awareness among faculty members in these fields.

Finally, the University provides services for students including physical environment such as sports facilities, social and psychological support networks such as guidance and counseling services and health services. To improve graduation rates and employability of graduates, the program could set up an evaluation system for monitoring students.

The remote assessment set-up offered some advantages as compared with face-to-face assessment, as shown in Table 1. One major advantage was the flexibility of the remote set-up to deal with disturbances. In fact, a day before the start of the remote assessment, a strong typhoon hit the country which led to internet connectivity problems in the campus. However, this only affected some activities and the 5-day assessment proceeded as planned. Face to face mode in this scenario would have led to the total cancellation of the activities to ensure safety of the staff, assessors and stakeholders. Although the remote set-up had other disadvantages, the objectives of the assessment were achieved despite such limitations.

Table 1. Comparison of the modes of AUN-QA assessment.

Assessment Mode	Advantages	Disadvantages
Face-To-Face	<ul style="list-style-type: none"> • Better communication and physical interaction with the assessors • Easier coordination of activities • Better engagement and collaboration during meetings and workshops • Ready access to necessary documents and facilities relevant to the assessment 	<ul style="list-style-type: none"> • Higher cost for transportation, lodging, food, and physical arrangements • Limitation in the availability of stakeholders for interview due to the need to travel to/from UPLB
Remote	<ul style="list-style-type: none"> • Flexibility of the set-up in dealing with other unforeseen problems and disturbances like typhoon, etc. • Lesser cost for physical arrangements, transportation, lodging and food • Paperless submission of documents • Amenability of stakeholders to accommodate the interview schedule • Easier facilitation of virtual orientation for stakeholders and staff 	<ul style="list-style-type: none"> • Lesser interaction with the assessors • Limitation in the facilities and areas that can be shown during the virtual tour • Interruption in internet connection and other technical glitches • Greater effort and time needed for the preparation of recorded materials (which served as backup for the virtual tour) • Availability of technical equipment and gadgets (video camera, headsets, etc.)

4. Conclusions

The success of a quality assurance system in any institution depends on the support of the management (Kahveci, et. al., 2012). Quality assurance initiatives in the university must start from the higher administration down to its academic units. This top-down approach during the preparation of the BSChE program for the AUN-QA Online Assessment ensured that DChE received full support from the key offices in the University. A structured and functional internal quality assurance system in the university is vital in this kind of assessment. Delegation of tasks to committee members during the preparation of SAR and actual assessment effectively distributed the workload. The results of this AUN-QA Assessment motivated the UPLB BSChE program to direct its focus on the continuous improvement of its quality assurance system to ensure the delivery of high quality chemical engineering education to its stakeholders. As part of the post EQA, the department will conduct post-assessment activities such as strategic planning workshops

following the PDCA cycle. It will formulate its plans and targets to address the weaknesses and sustain the good practices identified during the AUN-QA assessment.

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