College of Pharmacy

Assessment of Learning Outcomes Handbook

PharmD Program

v 2023

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Abbreviation used in the documents:

COP   **:** College of Pharmacy

KKU   **:** King Khalid University

DIOAR   **:** Design → Implement → Observe → Analyze → Revise

CLO   **:** Course Learning Outcome

NCAAA   : National Commission for Academic Accreditation and Assessment

PLO   : Program Learning Outcome

CR   : Course Report

MCQ   : Multiple Choice Questions

DMA   : Direct Method of Assessment

BB   : Blackboard

OMR   : Optical Mark Reader

SGSAR   : Student Grades and Statistical Analysis Reports

SAQ   : Short answer question

NQF   : National Qualification Framework

Pharm.D   : Doctor of Pharmacy

SPLE   : Saudi Pharmacist Licensure Examination

CS   : Course specification

SCFHS   : Saudi Commission for Health Specialties

VD-ED   : The Vice Dean of Educational Affairs and Development

GAs   : Graduate Attributes

PMs   : Program Missions

PGs   : Program Goals

Outcome-based education should be the foundation of the assessment plan. According to KKU policies and regulations, assessment plans must contain different assessments activities at the course levels.

1. Principle of Learning Outcomes Assessment:

- To ensure that learning opportunities and assessment strategies meet the needs of students and the curriculum while fostering achievement and advancement.
- To advance learning by determining where each learner is in their learning, making clear what the next learning goal is, and then assisting the learner in achieving that goal.
- To ensure that testing is not just a one-time event at the conclusion of a unit of work, but rather a multifaceted, collaborative engagement between the teacher and the student that enhances both the student's performance and their learning capacity.
- To increase the variety of assessment methods to include exams, assignments, presentations, oral/interview tests, and projects conducted in person or digitally.

1.1. Assessment Policy:

This policy is applicable to all academic programs and departments on campus that offer courses that count toward undergraduate or graduate degree programs. It is the methodical and continual process of gathering, examining, and using data from measured outcomes (direct and indirect) to enhance the standards of student learning practices. It differs from an evaluative assessment for a specific course, student, or faculty member.

1.2. Assessment Methods:

To gather evidence of student learning, faculty are encouraged to use a variety of assessment methods as means obtaining effective feedback regarding their students' performance in their general education courses. The two commonly used assessment methods are direct and indirect.

1.3. Dioar Model

The DIOAR (Design → Implement → Observe → Analyze → Revise) model is shown in Figure 1 below, serves as the foundation for the Teaching and Learning Quality Assurance and Improvement process. To enhance students' learning, a design is made for the academic process components at this phase. It is expected to create an Academic Assessment design (AP) for the entire course, which outlines a roadmap for evaluating the learning outcomes based on their course level.
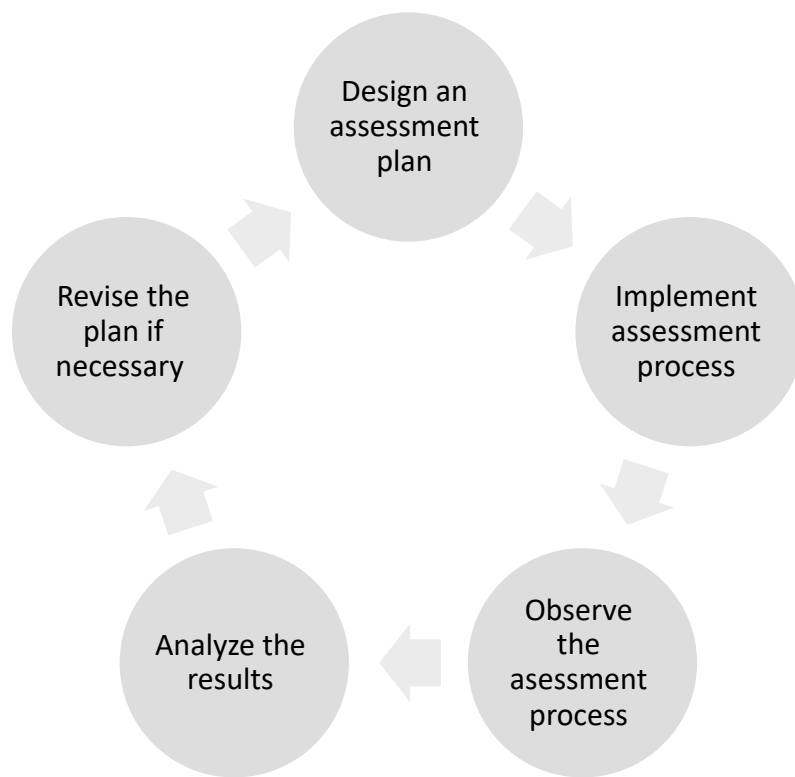
Fig. 2: DIOAR model

2. Teaching & Learning Strategy

Teaching and learning strategies in the COP at KKU should encourage skills development and therefore support graduates' employability. The teaching and learning strategies should be based on the following theories:

Adult learning models and principles, e.g., Knowles' andragogy, considering individual differences and the learning situation. The core adult learning principles according to Knowles's andragogy, are as follows:

- The learner needs to know how the learning will be conducted, what learning will occur, and why that learning is valuable.
- Building personal autonomy in adult learners and assisting them to shift towards better self-direction.
- Prior experiences of the learner can greatly affect the learning process of the adult learner.
- Readiness to learn is encouraged by life situations that generate a necessity to know and the need for direction and support in the learning process.
- Adult learners' orientation to learning is generally problem-solving over subject-centered learning, and the learning is facilitated by presenting the information in a real-life context.
- Adult learners generally become more motivated in learning which results in internal need satisfaction or helps them solve problems in their lives.

2.1. Learning taxonomies

Learning taxonomies, Bloom's taxonomy as an example, is known to explain different types of learning behaviors. They are typically used to describe and differentiate between different levels of learning development. They are useful tools that assist in designing course curricula, teaching methods and assessments. **Bloom's taxonomy** classifies (Fig. 2) cognitive skills into six levels ranging from lower-order skills that involve

less cognitive processing to higher-order skills that require deeper learning and a greater level of cognitive processing.
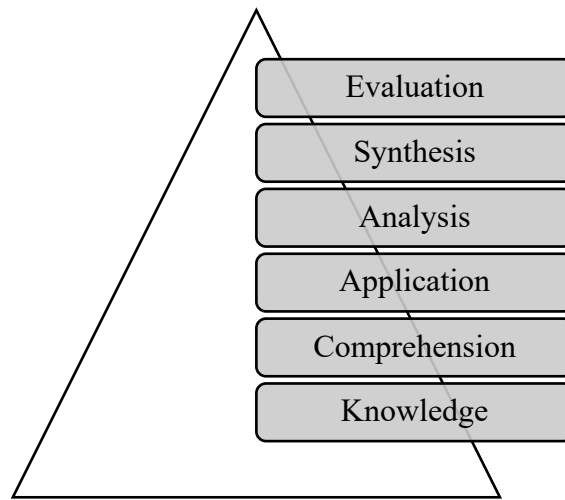
Fig. 2: Bloom's Taxonomy

2.2. Miller's Pyramid

Miller's pyramid is a framework that classifies clinical skills, competence, and performance. In other words, it distinguishes knowledge at the lower levels and action at the higher levels (Fig. 3). The first level of Miller's pyramid (Knows) represents the knowledge that might be applied in the future career of the student to demonstrate competence. Examples of assessment methods that could be used to assess this level include essays, oral examinations and multiple-choice questions. The second level of Miller's pyramid (Knows how) represents context-based tests that require the use of both knowledge and skills. The next hierarchal level Shows How. Assessment methods used to meet an outcome at this level require a pharmacy student or trainee to be able to demonstrate that they can perform in both a simulated environment and in real life, for instance, objective structured clinical examinations (OSCEs) and simulated patient assessments. The top level of Miller's hierarchy, Does, corresponds with assessment methods that enable the examination in the context of the student's ability to

demonstrate the outcomes in a complex and everyday situation repeatedly and reliably. OSCEs and observing trainees are two examples of assessment procedures that could be used to assess an outcome at the final level of Miller's pyramid.

```
                    Does
                 Performance

               Shows how
           Demonstration of Skills

             Knows how
      Applied Knowledge to Scenarios

              Knows
          Recitation of facts
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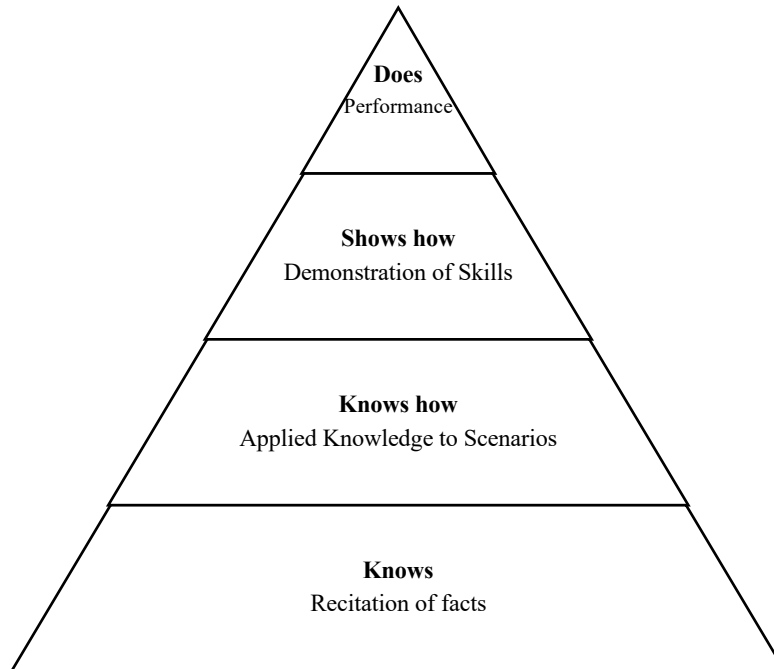
Fig. 3: Miller's Pyramid

Course contents and teaching and learning methodologies at the COP are updated regularly based on two indicators including student feedback at the end of the term "course evaluation survey" and analyzing the student's assessment data. Findings from these indicators are then fed into an action plan for course improvement which is drafted in the course report by the course coordinator. Action plans for each course are then discussed and approved by the department quality and development committee and then sent to the college quality committee for feedback and approval. Closing the loop can

then be achieved by updating the course content and/or updating the teaching and learning methodologies and strategies (Fig. 4). To evaluate the teaching strategies, data from student feedback in the course evaluation survey are analyzed and used as a key performance indicator (KPI-P-06) to measure student satisfaction across both male and female sections regarding the effectiveness of teaching methods.
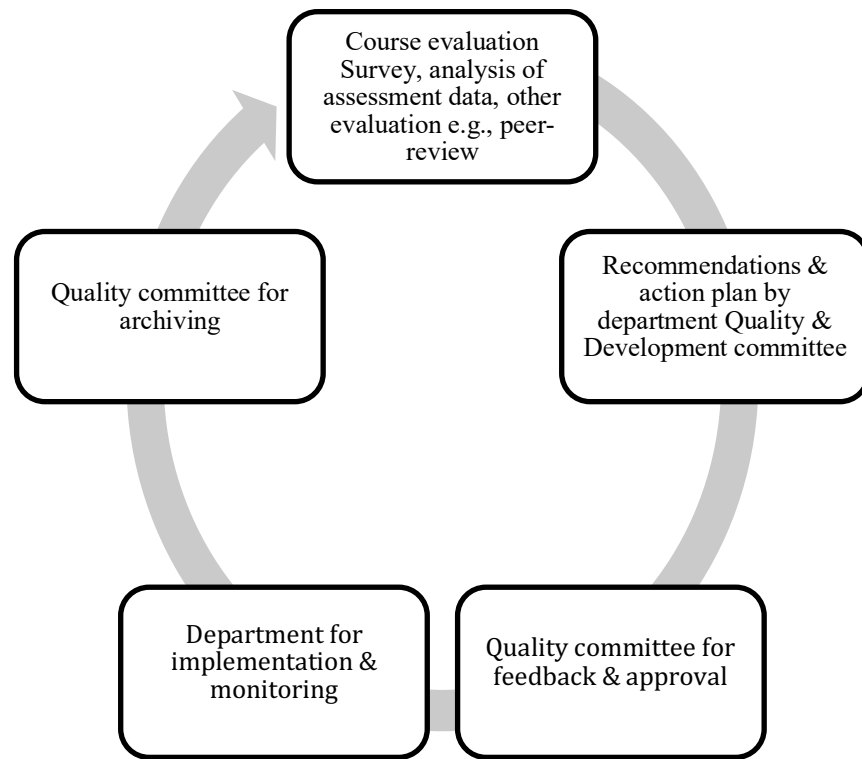
Fig.4: Flow Chart for Updating Teaching and Learning Strategy

3. Assessment of Course Learning Outcome (CLO)

3.1. Course Assessment Process using the DIOAR Model

A DIOAR cycle should be included in the course assessment plan to demonstrate the programs' ongoing progress.

3.2. Designing

With the aid of appropriate assessment tools (such as a learning outcome rubric) and indirect assessment techniques, the course instructor will choose the most appropriate assessment tools for course-level evaluation (e.g., course exit surveys). Assessment at the course level will be decided at the academic units' discretion. In the planning stage, the following actions are taken.

- The Course Coordinator should create an assessment plan that details how all CLOs will be evaluated, whether directly or indirectly.
- The department council must approve the plan for the course assessment.
- Direct measures utilizing a unique rubric for each CLO will be used to evaluate all CLOs at the course level.
- Every academic semester, the chosen direct assessment method(s) should cover all CLOs in a course.
- The chosen tools, such as a quiz, mid exam, practical exam, final exam, and a course project, account for the overall course assessments.

3.3. Implementing

- The specified course assessment plan is put into practice through direct (like rubrics) or indirect means (using surveys).
- Academic departments are free to employ the appropriate tools and strategies to gauge the success of their students' learning efforts using a recognized standard scale.
- In accordance with the combined course report required by NCAAA (National Commission for Academic Accreditation and Assessment) standards, the course

instructor shall report all CLO results at the end of each academic semester using both direct and indirect methods.

- The PLO (program learning outcome) evaluation results for the courses chosen for the program assessment must be submitted by the course instructors at the conclusion of each academic semester.

3.4. Observing

- The CLO assessment process must be observed throughout the semester by the Quality Committee members.
- Using the relevant calculations and methods, the Course Coordinators gather and analyze the CLO assessment results (direct and indirect) for the respective courses after each semester. Then, the course instructors review the improvement measures related to learning outcomes, curriculum, and course delivery before submitting them for approval to the Quality Committee and Curriculum Committee.

3.5. Analyzing & Revising

- In collaboration with course coordinators, the Curricula Committee and the Department Chairpersons will examine and accept proposals for course improvement or the promotion of best practices based on the analysis completed.
- The outcomes of the course evaluation are also included in the annual program report and communicated to the course coordinator for program-level monitoring and feedback.
- The department chairperson receives these authorized action plans and submits them for inclusion in the course decision-making and ongoing improvement.

The following are the examples of some action plans for implementation:

3.6. Action plans for Implementation

Table 1: Action plans for implementation

Proposed plan	Timeline	Responsible person	Measuring indicators
Evaluation of assessment plans in course specifications (verify the quality and validity of the assessment methods)	End of Semester	Course Coordinator/ instructor	Number of achieved CLOs in CR (course report).
Upgrading exam design using available online tools (blackboard)	Start of each academic year	Exams committee	checklist inside the technical regulations for exam design
Verifying originality of students' work. (e.g. graduation projects and assignments through Safe assign)	End of Semester	Course Coordinator/ instructor	Number of checked reports (blackboard system, SafeAssign)
Providing Feedback to students about their performance and evaluation results	During each semester	Course Coordinator/ instructor	Copies of feedback, and mark lists on blackboard
Ensuring Interim evaluation of students' performance during the semester	During each semester	Course Coordinator/ instructor	Interim assessments
Holding workshops to provide academic staff members with novel assessment methods suitable for learning domains	Start of each Academic year	Quality and Development Committee	No. of attendees/Workshop Evaluation survey

3.7. CLOs Assessment types

An assessment *system,* derived from the assessment strategy*,* will often consist of a selection of *types* of assessment. However, that selection is not commonly made as a result of careful matching with learning outcomes. More often, it results from historical developments, personal preferences or bias, financial or other resource constraints. Where the selected assessment types do match desired or predetermined learning outcomes, one might consider that the assessment system meets its strategic

requirements. Those who are responsible for establishing assessment systems have a wide choice of types from which to choose. The ultimate decision, however, should depend on fairness to the candidate, so issues of validity and reliability must prevail.

At the college of pharmacy, the percent (%) of achievement of CLOs is being measured for each campus separately and combinedly. The calculation method for achievement for each CLO has been updated. Previously, college is used to take the average of achievement in each CLO regardless of the number of marks for that CLO for each assessment (direct). Currently it is a weighted average based on the allocated marks for each CLO (in all assessments). The college has fixed the domain targets to 80% (for knowledge and skills domains) and 85% (for value domain).

There are two types of CLO Assessment: **Summative assessment** and **Interim assessment**

Assessment has three purposes. It is designed to support and enhance learning, it provides certification for advancement, and it can be a form of accountability (quality assurance) for stakeholders. Either *Interim* or *summative* assessment methods are used to support these purposes. This includes written examinations, assignments, E-learning platforms, practical examinations, and oral presentations.

Interim assessment is ongoing, providing both instructors and students with information about current progress in order to support future learning. It consists of assignments and quizzes. Assignments are given via Blackboard and students are encouraged to access online resources to answer the assignment tasks, and Quizzes can be paper-based or computer-based. Summative assessment provides information about the level of a student's performance at certain points in the learning process, usually at the end of a course of study. It consists of midterm and final examination for both theory and practical sessions. The questions will be assessed before conducting the exam based on the different learning domains. In addition, the MCQ questions will be assessed by the grading machine for their difficulty and discrimination.

Another technical term of relevance to this work is *high-stakes assessment*. High-stakes assessment is where the result of a summative assessment has the potential to alter the course of a candidate's life in some way: the greater the impact, the higher the stakes. Final qualification examinations in accounting are good examples of 'high stakes, summative assessments.

3.8. Assessments that are valid, reliable, and fair

- Evidence that the intended knowledge and skills are well measured
- Evidence that scores are related to the abilities they are meant to measure.
- Evidence that the assessments are well-designed and valid for each intended use—and that uses are appropriate to the test purposes and validates evidence
- Evidence that the assessments are unbiased and fairly measure the knowledge and skills of students from different language, cultural, and income backgrounds, as well as students with learning differences
- Evidence that the assessments measure students' learning accurately along a continuum of achievement, consistent with the purposes the assessments are intended to serve

3.9. Validity and reliability

In evaluating assessment methods, it is important to consider both *validity* and *reliability*. Validity is all about proper sampling from course learning outcomes and course content. Reliability is a measure of consistency. Consistent score meanings over time, within years, and across student groups and delivery mechanisms.

- If we want to determine whether our students met the learning objectives of our course, we are considering **content validity.** There is evidence for content validity when test items are well-aligned with the subject matter (knowledge) and cognitive levels of our course objectives and learning activities.

- If we want to determine whether our students will do well on an external exam, we are considering **criterion validity.** There is evidence for criterion validity when scores on both assessments are highly correlated.
- If we want to determine if our assessment is theoretically sound, we are considering **construct validity.** There is evidence for construct validity when test scores, which measure an unobservable construct, are highly correlated with other variables as predicted by our theory.

3.10. Quality and Validity of the Assessment Methods

The program implements clear and publicized procedures to verify the quality and validity of the assessment methods (e.g., their specifications, diversity, and comprehensiveness to cover the learning outcomes, distribution of grades and accuracy of marking), and to ensure the level of student achievement.

Table 2: Quality and Validity of the Assessment Methods

Quality and Validity of the Assessment Methods	Suggested Evidences
Revision of exams questions carefully	Questions Review and Approval Form (QRAF) should be reported to the Head of the Department
The courses are periodically evaluated for ensuring the effectiveness of the teaching and learning strategies and assessment methods, and reports are prepared on them	1. Course reports are up-to-date and approved (including an assessment of learning outcomes, teaching and learning strategies, assessment methods, and course development plans). The course report presents an action plan approved by the curriculum committee/department council and check for the progress and the improvement.
The program implements clear and publicized procedures to verify the quality and validity of the assessment methods (e.g., their specifications, diversity, and comprehensiveness to cover the learning outcomes, distribution of grades and accuracy of marking), and to ensure the level of student achievement.	1. Direct Method Assessment (DMA) protocol 2. The Program Specifications are up-to-date and approved (and a sample of the approved Course Specifications) that include an independent internal and external verification mechanism of the quality of assessment methods. - Sample from skill sheets for practical and clinical exams

	- Sample of exams' blueprints 3. Independent internal verification of students' work. 4. Submission of the declaration of the program guide (including the evaluation methods). 5. Students' manual for College of Pharmacy 6. Rules and regulations of the study plan announced on the blackboard 7. Program and report of student's orientation day 8. A sample of updated and approved course reports (including an analysis of student achievement levels). 9. Approved report of the evaluation questionnaires and includes a statistical analysis identifying the main strengths and opportunities for improvement and plans to implement the recommendations contained therein, and the completion report of the implementation plans.
Effective procedures are used to verify that the work and assignments of students are of their own.	A report outlining procedures for verifying that students' work is produced by, for example, using plagiarism detection programs (using safe assign in BB, Blackboard).
Issues related to problematic questions on exams, such as grammatical cues, logical cues, repeating words, etc.	Questions and Grades Revision Form should be reported to Head of the Department.
Fair exams correction	The exams are conducted through Optical Mark Reader (OMR) answer sheets, which are then corrected through the OMR scanner machine, which also provides content and grade analysis. This ensures that exam results go through a very secure and clear procedure (Standard Operating Procedure for OMR)
Grades (inflation or deflation)	Grade inflation/Deflation Report should be reported to Head of the Department and Vice Deanship of Educational Affairs and Development.

3.11. Process for Continuous Improvement

The process of continuous improvements is based on evaluations obtained from assessment types using various tools and methods. The course learning outcome results obtained are recorded and analyzed in course reports and the Course Coordinator compiles the aggregated Course Learning Outcome results based on all the course section CLO results. The semester course assessment report (from Student Grades and Statistical Analysis Reports SGSAR) is the survey/report template obtained for calculating CLO results. Recommendations provided by the department council based on these assessment and evaluation results are discussed in the Quality and Development Committee and actions are decided at the end of the closing loop. The actions decided from the process are systematically utilized for the improvement of the program as well as student learning.

3.12. Procedures for Quality Assurance of Students' Assessment and Evaluation Processes

3.12.1 Procedures/practices for designing a good test

According to King Khalid University policies for examination and student evaluation, a good test should be valid, reliable, transparent, objective and capable of measuring targeted learning outcomes. To construct such exams, course coordinators are required to use miscellaneous question types within the same test e.g. MCQs (multiple choice questions), SAQs (short answer question), Assignments, discussions, etc. written in clear language. Multiple choices questions (MCQs) Guideline and Examination Policies.

To ensure each assessment method is able to measure a specific learning outcome in the course, course coordinators are demanded to prepare a course specification form containing an alignment between CLOs, teaching strategies and assessment methods, and to submit a course learning outcome assessment report containing two matrices; the CLO/assessment task matrix and distribution of assessment grade with CLO and assessment task matrix. If an assessment method (e.g. written exam, practical exam,

presentation, etc.) is intended to measure more than one CLO, the assessment tool/instrument is designed so that its total marks are distributed among the CLOs to be measured.

3.12.2. Procedures/practices to ensure fair and effective application of student assessment.

Based on King Khalid University policies for examination and student evaluation, clear measures are to be taken to announce assessment methods together with its associated schedule and results to students, ensure exam secrecy, monitor cases of late assignment submission, establish effective invigilation process, evaluate graduation research projects and online exams effectively, manage cheating cases, excuses and exceptions, grievances, and requests for re-correction. The measures involve:

3.12.2. A-Pre-exam measures:
- Course coordinators prepare course specification and plan containing schedule of assessment tasks and announce it to students through the blackboard.
- Timetable for mid and final exam is announced to students.
- Exam papers are circulated in sealed envelopes with proper authentication forms.
- Students are alerted about late submission via blackboard.

3.12.2. B-During exam measures:
- Exam unit informs staff members about their duties during an invigilation task.
- Graduation research projects are evaluated through committees using rubrics.
- E-learning unit instructs teaching staff on construction of online exams.
- E-learning unit instructs students on methods of taking online exams.
- Cheating students receive disciplinary actions according to university regulations.
- The program accepts valid medical excuses as per the regulations of university norms.

3.12.2. C-Post-exam measures:

- Periodic evaluation results are announced to students via Blackboard within maximum of 72h.

- Final results are announced to students through academia link.

- Feedback is given to students on their answers through Blackboard.

- Students are allowed to submit requests for re-correction of exam paper within a defined time frame according to university regulations.

- The program forms a committee for destroying and disposal of exam papers.

3.12.3. Procedures/practices for verification of quality of student evaluation process

The relevant committee in each department is responsible for revising the exam papers of the courses belonging to this department to verify their quality and validity. The committee has to analyze and evaluate the exam paper containing the following items;

- If exam questions are valid, clear, independent, and free from answer bearing statements.

- If exam language is clear

- If exam questions assess memorization, comprehension, and application.

- If exam questions differentiate between student levels

- If exam questions cover the entire learning outcomes of the course

- If answers were corrected according to the model answer key prepared by course coordinator

- If the correction of answers was conducted with full fairness, transparency, and integrity.

- If the correction of answers was comprehensive and covered all student input

- If correction of answers considered differences in student answers relative to each learning outcome

- If the correction of some answers does not need recalibration

- If there are questions that need to be modified in the exam paper or model answer key

Likewise, the *internal reviewer in* each department is responsible for revising the correction of the exam answer sheets of the courses belonging to this department to verify the accuracy of students' grade assessments. The course coordinator checks the correction and marking of the final exam answer sheets of all students enrolled in the course. The *quality committee in the department* works centrally to follow up on the process of verification of student evaluation in each department.

4. Assessment of Program learning Outcome (PLOs)

4.1. Introduction:

The College of Pharmacy at King Khalid University is committed to the vision set by its leadership to achieve the overall vision of the university, as well as of the KSA vision of 2030. The college has created a conducive academic environment wherein pharmacy education, training, and research are emphasized concurrently. As educational institutions and programs are being closely monitored through the National Center for Academic Accreditation and Assessment (NCAAA) accreditation process to ensure implementation and achievement of the qualifications and characteristics prescribed in the National Qualification Framework (NQF), the Pharm.D program learning outcomes (PLOs) of college of pharmacy were updated and benchmarked with several nationally and internationally certified pharmacy colleges. The main PLOs of the current Pharm.D program are consistent with NQF program outcomes, where all three learning outcomes are covered.

4.2. Status of Pharm D. PLOs

Pharm D PLOs, 3 domains (1. Knowledge, 2. Skills 3. Values). See Table 3 for current PLOs adopted in the program.

Table 3: PLOs (3 Domains)

Program learning Outcomes	
Knowledge and Understanding	
K1	Recall the scientific knowledge derived from pharmaceutical sciences including natural and synthetic drugs, pharmacodynamics pharmacokinetic profile, drug formulation and delivery and other disciplines.
K2	Define scientific information related to biomedical sciences including functions of human body, biological, genetics, biotechnological, microbiological, and other aspects.
K3	Recognize the basic principles of pharmacy practice involving therapeutics, evidence-based pharmaceutical care, pharmacy management, pharmacoeconomics, pharmacoepidemiology, and other areas.
K4	Recall necessary foundational knowledge of research and administrative skills required in pharmacy profession.
Skills	
S1	Implement knowledge from the foundational sciences to become a medication therapy expert.
S2	Apply the knowledge derived from different pharmaceutical areas in conducting research studies in the fields of pharmacy practice and pharmaceutical sciences.
S3	Utilize evidence-based drug information retrieved from authentic resources to fulfill an appropriate patient- centered treatment plan.
S4	Demonstrate effective verbal and written communication and counseling skills when interacting with patients, healthcare professionals and the public.
S5	Interpret information obtained from various pharmacy-related resources regarding drug dosing, clinical pharmacokinetic parameters, and statistical data relevant to pharmacy practice and research.
S6	Contribute to decision making process by constructing patient-centered evidence-based pharmaceutical care plan and medical recommendations.
Values	
V1	Show responsibility and accountability through advocating patients' right to safe and effective medication use.

V2	Demonstrate leadership abilities through professionalism, self- and time-management, and team work skills that help resolving challenges in the pharmacy profession.
V3	Demonstrate high level of professional and ethical behavior with mutual respect towards patients and other healthcare professionals.
V4	Participate actively in enhancing the health care profession and general public awareness.
V5	Illustrate life-long learning in the field of pharmaceutics, biomedical sciences and pharmacy practice.

4.3. PLOs Assessment Methods

The PLOs have been assessed using a variety of methods, such as:

4.3.1 Direct assessment methods include rubric of CLOs/PLOs achievement method, the graduates' results in the Saudi Pharmacist Licensure Examination (SPLE), course grade distributions, annual reports, retention and completion rates.

> **4.3.1.1.Rubric of CLOs/PLOs assessment method:** The widely used Microsoft Excel has been used to develop in-house excel method (Excel file, v 3.2-2023) in measuring student's performance through all the approved direct method of assessments of different courses indicated in the specific course specification (CS) of Pharm D program's PLOs. The information below explains the procedures for obtaining the student's performance quantitatively. After completing all assessments methods and evaluating the student's achievement (%) from adopted CLOs on each course, at first collecting % achievement of adopted PLOs from each course extracted from the DMA file of the same course. Then calculate average value of each adopted PLO which will reflect the student's performance quantitatively to achieve their educational goals. Note that CLOs are already mapped with PLOs for Pharm D courses and % achievement of each PLO will be calculated based on the weighted average.

4.3.1.2. Saudi Pharmacist Licensure Examination (SPLE): The final PLO assessment is the results of our graduates in the Saudi Pharmacist Licensure Examination (SPLE) test. The main objectives of this course are direct assessment method of the college PLOS which includes: 300 pre-test questions and 300 post-test questions divided as: 10% Basic Biomedical Sciences (30 questions), 35% Pharmaceutical Sciences (105 Questions), 20% Social/Behavioral/Administrative Sciences (60 Questions), 35% Clinical Sciences (105 Questions) based on the intended learning outcomes which are fully aligned/mapped with college PLOs.

4.3.1.3. Course Grade Distributions: The grade distribution analysis report is done continually by individual departments in the college to ensure the quality of the courses taught and the achievement of the PLOs. A course grade distribution report shows the final grades given in each course and section. It aims to evaluate students' performance on their exams during the semester, as well as provide an indication of any concerns or failure results. A Schematic mechanism is given below in Fig 5 using a diagram:

Request is made academic services unit to get grade details. → Grades are obtained and entered the excel file department and coursewise. → Histogram is generated along with grade details. → All the grade details are entered in a word file campus, department and course wise.
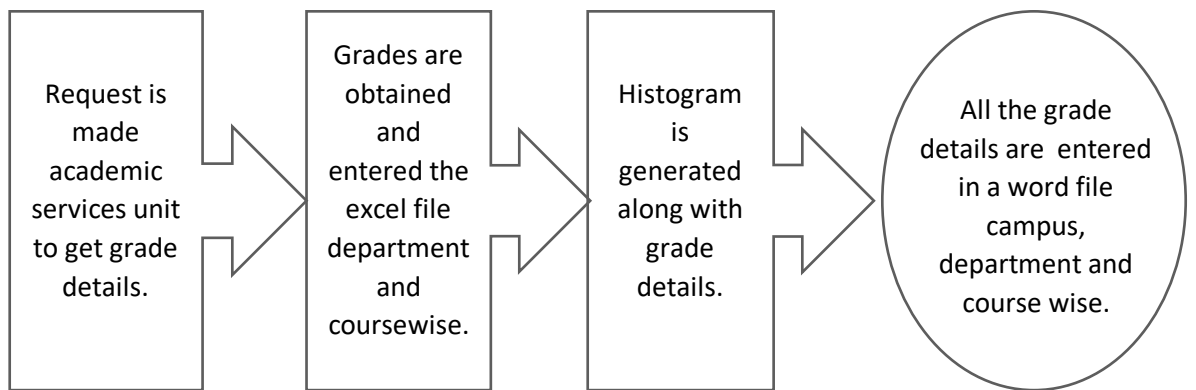
Fig 5: A Schematic mechanism of obtaining students grade

4.3.1.4. Retention and Completion rates: One of the important criteria in the program evaluation process is the calculation of the retention rates and completion rates for students. For example, the retention rate was calculated by taking the total number of first-year students who continued the program into

the next year (Level 3) to the total number of first-year students who were registered the same year (Level 1). The following calculation method has been used in this case:

$$Retention\ rate = \frac{Students\ in\ level\ 3}{Studenst\ in\ level\ 1}x100$$

4.3.1.5. Course and Annual Program Reports: The program and course reports were prepared using the NCAAA templates. These reports include several details regarding course issues, analysis, action plan, and priorities for improvement and these are directly related to the PLOs of the programs.

4.3.2. Indirect assessment methods include stakeholders' feedback obtained through the student experience survey, course evaluation survey, employer surveys, students' evaluation of the quality of their learning experience in the program (program evaluation survey), and an alumni survey. The PLOs indirect method assessment can be measured through the mapping of PLOs with (program goals, program mission and graduate attributes). In addition, % achievement for each PLO mapped with program goals (PGs) mapped with specific key performance indicators (KPIs).

4.3.2.1. Student Experience Survey: The Student experience survey measures the satisfaction and performance of the students regarding academic advising and support, and learning and teaching outcomes which is directly aligned with program learning outcomes (PLOs), mission and vision of the college of pharmacy.

4.3.2.2. Course Evaluation Survey: The course evaluation survey was designed to assess student satisfaction and performance regarding the teaching and learning of each course.

4.3.2.3. Employer Surveys: A survey that will be sent out on a regular basis will ask employers to review the success of the program's objectives.

4.3.2.4. The Program Evaluation Survey: The Program Evaluation Survey is conducted every year to seek students' feedback about various aspects of the

program. The survey form was created to evaluate the program's teaching and education aspects.

4.3.2.5. Alumni survey: The alumni survey aimed to evaluate the perception of the college's graduates regarding their achievement of the program learning outcomes (PLOs). This survey is an important tool to measure the quality and effectiveness of the program.

4.4. Assessment Evidence and Uses:

There is a wide range of evidences that college have been using when inquiring into student learning. The types of evidence detailed here demonstrate this wide range and cover both direct and indirect measurements. Some evidence can be described through a quantifiable number. This is referred to as quantitative evidence (direct). Other evidence is less easy to quantify. This is referred to as qualitative evidence (indirect). Both types of evidences are used by the college for assessing student performance showing in Table 4.

Table 4: Assessment Evidence and Uses:

Type	Program Assessment uses	Assessment Tools	What is analyzed?	Who is analyzed	What can be assessed
Direct	Scoring/%	CLOs/PLOs achievement analysis	All Assignments "Mid and final exams, Quizzes, assignments, etc"	Course Coordinators	CLOs/ PLOs achievements
Direct	Test score/%	Saudi Pharmacist Licensure Examination (SPLE)	Pharmacy graduate's competency level	Saudi Commission for Health Specialties	Comprehensive measure of knowledge in four major pharmacy content areas: • 10% - Basic Biomedical Sciences • 35% - Pharmaceutical Sciences • 20% - Social/Behavioral/Administrative Sciences • 35% - Clinical Sciences
Direct	Test score	Grade distribution analysis	Exam results	Quality Assurance Unit	Students performance in the exams
Direct	Program evaluation	Completion rate and Retention rate	Academic performance	Quality assurance unit	Student academic performance
Direct/indirect	Program evaluation	Program annual program reports	Area of improvement	Quality assurance unit	Program status
Indirect	Outcome assessment, program evaluation	Student experience survey, Course evaluation survey, The Program Evaluation Survey, Alumni survey, Employer survey	Program Teaching/Learning Program quality Faculties, etc.	Quality assurance unit	Perceptions about: programs (curriculum) , campus climate, teaching /learning methods, Faculties, etc.
Indirect	reports	Mapping of PLOs Vs PG Vs PM and GAs	achievement	Quality assurance unit	PLO achievement

4.5. Matrix mapping of Program learning outcomes (PLOs) between Graduate attributes (GAs).

The college of pharmacy has established a strong alignment between the program learning outcomes and all 6 graduates attribute respectively. In addition, the college has carried out effective alignment with the program mission and goals to ensure that college is providing quality teaching and learning and producing competent professional pharmacy graduates consistently.

College has developed appropriate strategies and tools for measuring the GA and verifying their achievement accordingly. At the end of the academic year we measure % achievement for each PLO (program learning outcome) accordingly and GAs are already mapped with specific PLOs. So % achievement of each GA will be derived from this mapping show in Table 5. The college has been adopting the following **Graduate Attributes (GAs):**

1. To implement knowledge from the foundational sciences to become a medication therapy expert.

2. To apply the knowledge derived from different pharmaceutical areas in conducting research studies in the fields of Pharmacy Practice and Pharmaceutical Sciences.

3. To utilize evidence-based drug information retrieved from authentic resources to fulfil an appropriate patient- centered treatment plan.

4. To be able to demonstrate effective verbal and written communication and counselling skills when interacting with patients, healthcare professionals and the public.

5. Interpret information obtained from various pharmacy-related resources regarding drug dosing, clinical pharmacokinetic parameters, and statistical data relevant to pharmacy practice and research.

6. To contribute to decision making process by constructing patient-centered, evidence-based pharmaceutical care plan and medical recommendations.

Table 5: Alignment between program learning outcomes (PLOs) and graduate attributes (GAs):

GAs / PLOs		GA1	GA2	GA3	GA4	GA5	GA6
K1	Knowledge and understanding	X	X	-	-	X	-
K2		X	X	-	-	X	-
K3		X	X	-	-	X	-
K4		X	X	-	-	X	-
S1	Skills	-	X	X	X	X	X
S2		-	X	X	X	X	X
S3		-	X	X	X	X	X
S4		-	X	X	X	X	X
S5		-	X	X	X	X	X
S6		-	X	X	X	X	X
V1	Values	-	X	-	X	-	X
V2		-	X	-	X	-	X
V3		-	X	-	X	-	X
V4		-	X	-	X	-	X
V5		-	X	-	X	-	X

4.6. Matrix mapping of Program learning outcomes (PLOs) between Program Goals (PGs).

College has developed appropriate strategies and tools for measuring the PGs and verifying their achievement accordingly. At the end of the academic year college measures % achievement for each PLO (program learning outcome) accordingly and PGs are already mapped with specific PLOs. So % achievement of each PG will be derived from this mapping show in Table 6. The has adopted the follwoing **Program Goals:**

1. Graduate medication therapy experts with knowledge, skills and values to meet health care and professional market requirements.

2.Provide competent students in pharmacy profession capable of effectively participating in foundational scientific research in the fields of Pharmacy Practice and Pharmaceutical Sciences.

3. Foster values and skills of the graduates that promote collaborations with other health care providers to enhance community services and public health awareness.

Table 6: Alignment between program learning outcomes (PLOs) VS Program Goals (PGs)

PGs / PLOs		PG1	PG2	PG3
K1	Knowledge and understanding	X	X	-
K2		X	X	-
K3		X	X	-
K4		X	X	-
S1	Skills	X	X	X
S2		X	X	X
S3		X	X	X
S4		X	X	X
S5		X	X	X
S6		X	X	X
V1	Values	X	-	X
V2		X	-	X
V3		X	-	X
V4		X	-	X
V5		X	-	X

4.7. Matrix mapping of Program learning outcomes (PLOs) between Program Mission (PM).

College has also developed appropriate strategies and tools for measuring the PM and verifying their achievement accordingly. At the end of the academic year college measures % achievement for each PLO (program learning outcome) accordingly and PM are already mapped with specific PLOs. So % achievement of PM will be derived from this mapping. The college has adopted the following **Program Mission:**

Provide a professional education that prepares graduates with competencies and skills to practice effectively in a wide variety of existing and future roles in patient-centered care, research and community services.

Table 7: Alignment between program learning outcomes (PLOs) VS Program Missions (PM)

PM / PLOs		Quality Education	Research	Community Services	Competency
K1	Knowledge and understanding	X	X	-	X
K2		X	X	-	X
K3		X	X	-	X
K4		X	X	-	X
S1	Skills	X	X	X	X
S2		X	X	X	X
S3		X	X	X	X
S4		X	X	X	X
S5		X	X	X	X
S6		X	X	X	X
V1	Values	-	-	X	X
V2		-	-	X	X
V3		-	-	X	X
V4		-	-	X	X
V5		-	-	X	X

4.8. Matrix mapping of PGs and objectives and key performance indicators (KPIs). College has also developed another way of measuring achievement of PGs and objectives accordingly using Key Performance Indicators (KPIs). At the end of the academic year college measures the achievement for each KPIs accordingly and KPIs and PMs are already mapped with specific PGs

and objectives. So % achievement of PGs and objectives will be derived (% average) from this mapping shown in Table 8 below. The achievement of each goal is measured with action plans that are to be monitored.

Table 8: Alignment between Goals, Objectives and KPIs

Goals	Objectives	Performance indicators
PG1	Continuous development of curricula and the means of pharmacy education.	KPI-P-06 Students' Evaluation of quality of learning experience in the program
	Nurturing future pharmacists that are well qualified and capable of continuous self-learning.	KPI-P-11 Graduates' employability and enrolment in postgraduate programs
		KPI-P-10 Students performance in national and /or proficiency examinations
PG2	Cultivation of research capabilities among the undergraduate students.	KPI-P-10 Students performance in national and /or proficiency examinations
		KPI-P-11 Graduates' employability and enrolment in postgraduate programs
		KPI-P-24 Average score of both research courses in the program and the obligatory research rotation for the pharmacy intern students
	Implementation and evaluation of Advanced	

	Pharmacy Practice Experiences (APPEs).	
PG3	Recognizing the importance of community-based activities in the pharmacy curriculum.	KPI-P-06 Students' Evaluation of quality of learning experience in the program
		KPI-P-11 Graduates' employability and enrolment in postgraduate programs
		KPI-P-23 Proportion of students actively engaged in community service

5. Conclusions:

The schedule of assessments with their weightage is spelled out in the course specifications given to students at the beginning of the semester. Several workshops were conducted for all faculties to ensure that they gained the required skills to write the Program Learning outcomes (PLOs), Course Learning Outcomes (CLOs), and Assessment Methods. The CLOs and PLOs have been assessed using a variety of adopted methods. This is how COP has been assessing all adopted assessment methods (direct and indirect) to make sure that purposes of qualification are successfully done.