MEASUREMENT DESIGN AND EVALUATION ANALYSIS OF LEARNING ACHIEVEMENTS TO SUPPORT ACCREDITATION IN THE ELECTRICAL ENGINEERING EDUCATION STUDY PROGRAM, NUSA CENDANA UNIVERSITY

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Abstract: The study was conducted to design and analyze measurement instruments for outcome learning in the Electrical Engineering Education Study Program at Nusa Cendana University that are relevant and comprehensive enough to help with the accreditation process. Unfurnished learning outcomes is a useful index of education quality and it is absolutely necessary to evaluate it qualitatively to meet the accreditation standard of study programs put forward by national accreditation body. This research was conducted to produce a procedure for instrument design to measure progress in learning through a three-stage process adapted from a quantitative and qualitative perspective (model and trial). Quantitative method: This method is used to collect data using questionnaires distributed to students and lecturers; Qualitative method: This method is applied through interviews and focus group discussions with stakeholders. The data obtained was analyzed using descriptive and inferential statistical methods to evaluate the effectiveness of learning outcomes and identify areas for improvement. The research findings showed that the instrument design could measure learning outcomes with a good level of validity and reliability. Furthermore, the analysis of the data shows that learning outcomes in the Study Program of Electrical Engineering Education have achieved most of the assessment criteria by accreditation institutions, even though there are still some elements that need to be improved. Thus, this finding provides valuable insight in strategizing to enhance the quality of learning and plan for accreditation in the long run.
Keywords: Learning outcomes; Qualitative; Quantitative; Learning; Accreditation

1 INTRODUCTION

Accreditation is a global standard for validating the quality and competency of institutions of higher learning. For example, international accrediting organizations such as the Washington Accord and AACSB (the Association to Advance Collegiate Schools of Business) recognize learning outcomes as an important marker of program quality [1-2]. Learning objectives are structured to help prepare graduates for the challenges of the 21st century, covering cognitive, psychomotor, and affective domains [3-4]. International evidence suggests that the use of direct and indirect methodologies of assessment has been especially prevalent in affluent countries: over 70% of educational institutions in high-income countries have reported using these approaches to inform their accrediting processes [5-6]. Hussain et al. acknowledge the increasing use of new technologies, such as data-driven learning analytics, to enhance transparency in evaluating and certifying learner outcomes. Learning outcomes are the knowledge or skills that a student is expected to have attained at the completion of an educational program. In higher education, outcome-centered learning (OBE) states that the ability to monitor the occurrence of outcomes is critical to the development of a suitable curriculum. Multiple studies also show the necessity of comprehensive assessment tools that measure cognitive, affective, and psychomotor domains [7-10].

An outcome-based, high-quality engineering education seeking to provide stimulating physical and social challenges for individuals must train graduates who are ready not just to solve technical problems, but also to be agents of change in business and society [11-12]. According to [13-14], who cites the Washington Accord and ABET as globally recognized certifications utilizing and endorsing these tests as reliable metrics. While it is widely considered important to assess not only what students learn but also how they learn, the practical implementation of learning outcomes assessment (LOA) remains lacking in many countries, especially in Indonesia. With less than 30% of past education programs in the country providing standardized resources for teaching and learning, laboratory and practical subjects are scarce across all subject areas [15-17]. This is often caused by insufficient resources, infrastructure, and learning outcomes analysis [18-20]. If not properly addressed, such gaps may arise and cause serious problems hindering the institution's reputation, e.g., graduates become less competitive in global job markets and standards of accreditation decline [21]. The need for proper evaluative feedback limits ongoing curriculum development and perpetuates systemic ineffectiveness [22-23]. Harapan dari program ini adalah bersifat komprehensif dan dapat DIpercayai terhadap toying belajar hasil mahasiswa agar dapat di manfatkan sebagai syarat akrediatsi yang berkeadilan bagi prodi Pendidikan Di sistem Elektro Nusa Cendana university.

(1) To identify key learning outcome indicators aligned with national and international accreditation standards.
(2) To design an assessment tool encompassing cognitive, affective, and psychomotor domains.
(3) To validate the reliability and effectiveness of the tool to ensure accurate and actionable results.

The findings of this study are expected to make significant contributions to enhancing the quality of higher education, particularly in meeting accreditation standards in Indonesia.

2 METHOD

The learning achievement measurement design is implemented to measure the activity of students' learning load in cognitive, affective and psychomotor aspects whose assessment must be adjusted to the learning outcome or learning achievement of the course and the learning achievement of graduates. According to cognitive is a thinking process [24], namely the ability of individuals to connect, assess, and consider an event or incident. According to Woolfolk that cognitive is one or several abilities to obtain and use knowledge in order to solve problems and adapt to the environment. Vygotsky stated as quoted by [25-27] that cognitive ability to help solve problems, facilitate action, expand abilities, and do something according to their natural capacity. [28-29] explained that cognitive is a broad understanding of thinking and observing, so it is a behavior that results in people gaining knowledge or what is needed to use knowledge. This means that by having cognitive abilities, students use their thinking tools to observe, connect, assess, and consider an event or incident in order to solve problems as effectively and efficiently as possible in achieving goals. The more stimulation a child gets when interacting with the environment, the faster their thinking function develops.

Definition of motor skills as the ability to perform physical movements involving muscle, tendon and joint movements directly in a certain sequence, by coordinating movements as limbs in an integrated, orderly and smooth manner without much reflection. [30] the domain is divided into 7 levels, namely: (a) Perception, The ability to make precise discrimination between two or more stimuli, based on the differences between the physical characteristics that are typical of each stimulus. (b) Readiness, The ability to place oneself in a state of starting a movement or series of movements. This readiness is in the form of physical and mental readiness; (c) Guided movement, The ability to perform a movement according to the example given (imitation). This ability is expressed by being able to follow the movement that is exemplified. (d) Habitual movement, The ability to perform a series of movements smoothly according to the correct procedure without seeing an example, because it has been trained previously; (e) Complex movement, The ability to perform a skill consisting of several components correctly, smoothly, and efficiently. (f) Adjustment of movement patterns, Ability to make changes and adjust movement patterns to existing conditions and have reached the level of expert skills; (h) Creativity, Ability to create various new movement patterns based on one's own initiative and initiative. This condition can only be achieved if the person has high skills and dares to think creatively. [31-32], conveyed that skills in the psychomotor domain are more directed at muscle movements and their coordination in using tools.

Motor skill actions are born through practical activities. In practice, it can strengthen the learner's motor skills and can apply knowledge and cognitive abilities, foster correct work habits and attitudes, and improve their skills. Based on basic competencies, learners are directed to practice so that militiaman motor skills can be achieved. From the process of practicing motor skills carried out through sufficient practice and repeated procedures, progress in the percentage of skills will be obtained [33]. Thus, if the implementation procedure is good in the form of practice that is carried out repeatedly, it will form a movement habit so that it can also produce better motor skills.

This research is directed to design learning achievement measurement in the form of course mapping based on graduate learning outcomes and course learning outcomes, then evaluation mapping is carried out consisting of: Learning Achievement Assessment Course Level

(1) Direct assessment: Written exams, quizzes, lab reports, project reports, papers, oral presentations, practical exams
(2) Indirect assessment: Evaluation of the Teaching and Learning Process
a. Study Program level
(1) Direct assessment: Exit test/exam, thesis exam
(2) Indirect assessment: alumni survey, graduate user survey, self-confidence survey
b. Stages of Learning Process evaluation at Course Level
(1) Evaluation of learning outcomes
(2) Evaluation of CLO achievement, not final grades
(3) Conducting item analysis
(4) Identifying questions that are in accordance with CLO
(5) Identifying whether students answer correctly/incorrectly
(6) Input for improvement at the course level
(7) Improving teaching materials
(8) Improving learning methods
(9) Improving the quality of questions

The evaluation instrument is in the form of a questionnaire/inter-survey whose results are presented in the form of a description with the help of statistical figures. Thus, this research is a descriptive study with a correlation method between variables.

3 RESULTS AND DISCUSSION

3.1 Measurement and Assessment Tools

Measurement and assessment of learning outcomes for the Learning and Teaching course uses the following:

○ Soft Skills: Attendance and Participation
○ Tasks
○ Mid Exam
○ Final Exam

3.2 Assessment Map of Graduate Learning Achievements

Before measuring the learning outcomes of course graduates, the first step is to create a Graduate Learning Achievement assessment map which is shown in Table 1.

Table 1 Graduate Learning Achievement Assessment Map

Peta Assesment CPL Belajar dan Pembelajaran (Teori + Praktikum) (2: 2-0) = 100% teori *) khusus non PBL dan PjBL					
Assessmen (Penilaian)	CPL1	CPL2	CPL3	CPL4	Total
Soft Skill (Kehadiran, partisipasi) (25%)	6,3	6,3	6,3	6,3	25
Tugas (15%)	3,8	3,8	3,8	3,8	15
UTS (30%)	7,5	7,5	7,5	7,5	30
UAS (30%)	7,5	7,5	7,5	7,5	30
Total	25	25	25	25	100

Figure 1 Graduate Learning Achievement Definition

3.3 Assessment Rubric

After creating a map of graduate learning achievement assessments, an assessment rubric is created as shown in Table 2.

Table 2 Assessment Rubric

Students in the "Excellent" category—which denotes the highest level of achievement—show a deep and comprehensive understanding of the subject matter. This student body is capable of applying knowledge, elucidating concepts, and connecting academic ideas to practical situations. Although they may have trouble correctly expressing or applying certain concepts, students in the "Good" group demonstrate a high level of comprehension. Although they are unable to interpret or elaborate on the content, students in the "Fair" category have a fundamental comprehension of it. Last but not least, pupils in the "Poor" group show poor understanding and lack the essential foundational skills. Weights make the rubric a better assessment of student achievement. It addresses best functioning well enough and resides on the right side of achieving differences in skills. This quantitative approach provides a clearer view of the group student performance and progress on the CPL goals of the program. The rubric also gives educators a way to track student progress over time and offer them honest, realistic feedback. Clarifying the goals and performance objectives that are listed on a rubric enables students to assess their growth and recognize what they still have to improve. Its bottom line lets me criticize, so it promotes both professional and academic development. It needs to be updated regularly in order to stay relevant. The comments from teachers, students, and implementation observations can serve to refine alignment, strengthen relevance, and increase clarity to program goals. Still, it takes the rudiments of a penitentiary to ensure that the rubric remains aligned with changing academic and occupational codes. Finally, the assessment rubric is conducive to indicating learning outcomes that correlate with pupils' activities. It ensures that testing upholds justice, transparency, and alignment with CPL indicators, hence confirms the skills students are expected to learn.

3.4 Student Presence

Assessment is predicated on student attendance in accordance with the regulations established by the university. Student attendance is presented in Table 3.

Table 3 Student Attendance

JUMLAH REALISASI KELAS TATAP MUKA SELAMA 1 SEMESTER (TIDAK TERMASUK EVALUASI CPMK)							
Realisasi total perkuliahan tatap muka dengan dosen pengampu:			**14**		kali tatap muka		

IDENTITAS DAN PRESENSI PESERTA KULIAH

Isikan identitas peserta kuliah: NIM dan Nama Mahasiswa. Sebelum menghitung nilai akhir, isikan data presensi

No.	NIM	Nama Mahasiswa	Hadir	Ijin	Sakit	Jumlah Presensi
1	2201130076	SEPTIANUS CHARLES TEFA	14	0	0	14
2	2301130003	NOLDINA NOBISA	14	0	0	14
3	2301130005	YUSUF MARTHIN DATO	14	0	0	14
4	2301130009	KAROLUS SUGI MASAN	14	0	0	14
5	2301130011	DZULFIKAR MUHAMAD	14	0	0	14
6	2301130013	CLEMENTINA RIA JATA	14	0	0	14
7	2301130014	MARTHA AGUSTINA NIFU	14	0	0	14
8	2301130015	MARIA PRILA F. YOTI	14	0	0	14
9	2301130019	SOLEMAN NAIDJUF	14	0	0	14
10	2301130020	BENDITA MARIA LEITE	14	0	0	14
11	2301130022	YUSAK B. NENO	14	0	0	14
12	2301130023	NMEIDIENSI S. ERENCA TEFA	14	0	0	14
13	2301130028	JANUAR NENABU	14	0	0	14
14	2301130030	SOSIPATER F. F. LABI	14	0	0	14
15	2301130033	JEFRIANUS UN	14	0	0	14
16	2301130034	FALENTINUS F. M. BETU	14	0	0	14
17	2301130035	CHINDY ANGELIA ORA	14	0	0	14
18	2301130038	NOVANBRE N. TRISAPUTRA	14	0	0	14
19	2301130044	INTAN YUNITA BANI	14	0	0	14
20	2301130045	GILBERTUS DAPA	14	0	0	14
21	2301130049	PAKTOMIUS PUTRA ARIFIN NGGAJO	14	0	0	14
22	2301130051	YOHANES F. Y. LADO	13	0	1	14
23	2301130053	TIO E. BOKOS	13	1	0	14
24	2301130054	VIRGINIUS SURYA G. R. WALENG	13	0	1	14

3.5 Measurement of Graduates' Learning Achievements

After conducting CPL mapping, creating an assessment rubric based on attendance assessment, then measurements were made of graduate learning outcomes, the results of which are displayed in Tables 4 and 5.

Table 4 Measuring Graduate Learning Outcomes

PEMBOBOTAN NILAI ASESMEN CPL-2

Isikan bobot nilai tiap Asesmen CPL-2. Jumlah total bobot nilai seluruh asesmen harus sama dengan bobot nilai CPL-2.

1	Bobot CPl-2 terhadap total jumlah seluruh CPL yang dibebankan	25	*Nilai otomatis diambil dari Sheet Bobot CPL-2*
2	Bobot Penilain -1: Softskill	6,25	
3	Bobot Penilaian-2: Tugas	3,75	
4	Bobot Penilaian-3: UTS	7,5	
5	Bobot Penilaian-4: UAS	7,5	
		25	

CPL -2

ASESMEN CAPAIAN PEMBELAJARAN CPL-2

Isikan tipe penilaian dan nilainya (skala 100) asesmen CPL-2.

HASIL PENGUKURAN CPL-2

Tabel ini memuat hasil perhitungan nilai asesmen capaian pembelajaran CPL-2 secara OTOMATIS

Menunjukkan sikap tanggungjawab atas pekerjaannya di bidang keahliannya secara mandiri

No.	NIM	Nama Mahasiswa	Penilaian-1 Softskill Nilai 1	Penilaian-2 Tugas Nilai 2	Penilaian-3 UTS Nilai 3	Penilaian-4 UAS Nilai 4	Penilaian-5 Praktikum Nilai 5	Nilai Capaian CPL-2	Status Kelulusan CPL:-2
1	2201130076	SEPTIANUS CHARLES TEFA	76,00	76,50	75,00	71,00	71,00	74	Lulus CPL-2
2	2301130003	NOLDINA NOBISA	75,50	76,50	70,00	63,50	63,50	70	Lulus CPL-2
3	2301130005	YUSUF MARTHIN DATO	76,50	76,50	78,00	72,00	72,00	76	Lulus CPL-2
4	2301130009	KAROLUS SUGI MASAN	77,00	76,50	85,00	71,00	71,00	78	Lulus CPL-2
5	2301130011	DZULFIKAR MUHAMAD	76,00	76,50	75,00	70,00	70,00	74	Lulus CPL-2
6	2301130013	CLEMENTINA RIA JATA	77,50	76,50	81,00	77,50	77,50	78	Lulus CPL-2
7	2301130014	MARTHA AGUSTINA NIFU	76,00	72,50	78,00	60,00	60,00	71	Lulus CPL-2
8	2301130015	MARIA PRILA F. YOTI	80,00	76,50	90,00	72,50	72,50	80	Lulus CPL-2
9	2301130019	SOLEMAN NAIDJUF	72,50	76,50	65,00	77,50	77,50	72	Lulus CPL-2
10	2301130020	BENDITA MARIA LEITE	77,50	76,50	83,00	60,00	60,00	74	Lulus CPL-2
11	2301130022	YUSAK B. NENO	77,50	76,50	80,00	65,00	65,00	74	Lulus CPL-2
12	2301130023	NMEIDIENSI S. ERENCA TEFA	76,50	76,50	82,00	68,00	68,00	76	Lulus CPL-2
13	2301130028	JANUAR NENABU	72,50	76,50	75,00	72,50	72,50	74	Lulus CPL-2
14	2301130030	SOSIPATER F. F. LABI	75,00	76,50	70,00	68,50	68,50	72	Lulus CPL-2
15	2301130033	JEFRIANUS UN	73,50	76,50	72,00	60,00	60,00	69	Lulus CPL-2
16	2301130034	FALENTINUS F. M. BETU	72,50	76,50	68,00	70,00	70,00	71	Lulus CPL-2
17	2301130035	CHINDY ANGELIA ORA	76,50	76,50	82,00	75,50	75,50	78	Lulus CPL-2
18	2301130038	NOVANBRE N. TRISAPUTRA	74,00	76,50	65,00	70,00	70,00	70	Lulus CPL-2
19	2301130044	INTAN YUNITA BANI	77,50	76,50	82,00	70,50	70,50	77	Lulus CPL-2
20	2301130045	GILBERTUS DAPA	72,50	76,50	60,00	74,00	74,00	70	Lulus CPL-2
21	2301130049	PAKTOMIUS PUTRA ARIFIN NGGAJO	76,50	76,50	80,00	65,00	65,00	74	Lulus CPL-2
22	2301130051	YOHANES F. Y. LADO	85,00	79,50	82,00	85,00	85,00	83	Lulus CPL-2
23	2301130053	TIO E. BOKOS	67,50	76,50	90,00	77,50	77,50	79	Lulus CPL-2
24	2301130054	VIRGINIUS SURYA G. R. WALENG	70,00	76,50	70,00	71,50	71,50	71	Lulus CPL-2

Table 5 Measuring Graduate Learning Outcomes

PEMBOBOTAN NILAI ASESMEN CPL-4

Isikan bobot nilai tiap Asesmen CPL-4. Jumlah total bobot nilai seluruh asesmen harus sama dengan bobot nilai CPL-4.

1	Bobot CPl-4 terhadap total jumlah seluruh CPL yang dibebankan ke	25	*Nilai otomatis diambil dari Sheet Bobot CPL*
2	Bobot Penilaian -1: Softskill	6,25	
3	Bobot Penilaian-2: Tugas I	3,75	
4	Bobot Penilaian-3: UTS	7,5	
5	Bobot Penilaian-4: UAS	7,5	
		25	

CPL -4

ASESMEN CAPAIAN PEMBELAJARAN CPL-4

Isikan tipe penilaian dan nilainya (skala 100) asesmen CPL-4.

HASIL PENGUKURAN CPL-4

Tabel ini memuat hasil perhitungan nilai asesmen capaian pembelajaran CPL-4 secara OTOMATIS

No.	NIM	Nama Mahasiswa	Softskill Nilai 1	Tugas I Nilai 2	UTS Nilai 3	UAS Nilai 4	Praktikum Nilai 5	Nilai Capaian CPL-4	Status Kelulusan CPL-4
1	2201130076	SEPTIANUS CHARLES TEFA	76,00	76,50	75,00	71,00	71,00	74	Lulus CPL-4
2	2301130003	NOLDINA NOBISA	75,50	76,50	70,00	63,50	63,50	70	Lulus CPL-4
3	2301130005	YUSUF MARTHIN DATO	76,50	76,50	78,00	72,00	72,00	76	Lulus CPL-4
4	2301130009	KAROLUS SUGI MASAN	77,00	76,50	85,00	71,00	71,00	78	Lulus CPL-4
5	2301130011	DZULFIKAR MUHAMAD	76,00	76,50	75,00	70,00	70,00	74	Lulus CPL-4
6	2301130013	CLEMENTINA RIA JATA	77,50	76,50	81,00	77,50	77,50	78	Lulus CPL-4
7	2301130014	MARTHA AGUSTINA NIFU	76,00	72,50	78,00	60,00	60,00	71	Lulus CPL-4
8	2301130015	MARIA PRILA F. YOTI	80,00	76,50	90,00	72,50	72,50	80	Lulus CPL-4
9	2301130019	SOLEMAN NAIDJUF	72,50	76,50	65,00	77,50	77,50	72	Lulus CPL-4
10	2301130020	BENDITA MARIA LEITE	77,50	76,50	83,00	60,00	60,00	74	Lulus CPL-4
11	2301130022	YUSAK B. NENO	77,50	76,50	80,00	65,00	65,00	74	Lulus CPL-4
12	2301130023	NMEIDIENSI S. ERENCA TEFA	76,50	76,50	82,00	68,00	68,00	76	Lulus CPL-4
13	2301130028	JANUAR NENABU	72,50	76,50	75,00	72,50	72,50	74	Lulus CPL-4
14	2301130030	SOSIPATER F. F. LABI	75,00	76,50	70,00	68,50	68,50	72	Lulus CPL-4
15	2301130033	JEFRIANUS UN	73,50	76,50	72,00	60,00	60,00	69	Lulus CPL-4
16	2301130034	FALENTINUS F. M. BETU	72,50	76,50	68,00	70,00	70,00	71	Lulus CPL-4
17	2301130035	CHINDY ANGELIA ORA	76,50	76,50	82,00	75,50	75,50	78	Lulus CPL-4
18	2301130038	NOVANBRE N. TRISAPUTRA	74,00	76,50	65,00	70,00	70,00	70	Lulus CPL-4
19	2301130044	INTAN YUNITA BANI	77,50	76,50	82,00	70,50	70,50	77	Lulus CPL-4
20	2301130045	GILBERTUS DAPA	72,50	76,50	60,00	74,00	74,00	70	Lulus CPL-4
21	2301130049	PAKTOMIUS PUTRA ARIFIN NGGAJO	76,50	76,50	80,00	65,00	65,00	74	Lulus CPL-4
22	2301130051	YOHANES F. Y. LADO	85,00	83,50	82,00	85,00	85,00	84	Lulus CPL-4
23	2301130053	TIO E. BOKOS	67,50	76,50	90,00	77,50	77,50	79	Lulus CPL-4
24	2301130054	VIRGINIUS SURYA G. R. WALENG	70,00	76,50	70,00	71,50	71,50	71	Lulus CPL-4

3.6 Results of Measuring Graduates' Learning Achievements

After conducting measurements based on the type of assessment, the results of measuring the learning achievements of graduates were obtained, which are displayed in Table 6.

Table 6 Results of Measuring Graduate Learning Outcomes Based on Assessment Type

REKAPITULASI HASIL CAPAIAN PEMBELAJARAN LULUSAN YANG DIBEBANKAN KEPADA MATA KULIAH BIOTEKNOLOGI PERTANIAN

Mata Kuliah:	Belajar dan Pembelajaran			Berpraktikum:	YA
SKS:	2 (Teori 2,Praktikum 0)	Kelas: PTE G3	Jumlah CPL: 4	Jumlah Kuliah:	14
Semester:	Genap	TA: 2023/2024	Dosen: Yetursance Yulsiana Manafe		

No.	NIM	Nama	Juml. min. Presensi	Lulus Seluruh CPL beban Mata Kuliah	Nilai CPL-1 (25)	Skala Rubrik	Status Rubrik	Nilai CPL-2 (25)	Skala Rubrik	Status Rubrik	Nilai Akhir Angka	Nilai Akhir Huruf
1	2201130076	SEPTIANUS CHARLES TEFA	OK	Lulus	74	3	Baik	74	3	Baik	37	E
2	2301130003	NOLDINA NOBISA	OK	Lulus	70	2	Cukup	70	2	Cukup	35	E
3	2301130005	YUSUF MARTHIN DATO	OK	Lulus	76	3	Baik	76	3	Baik	38	E
4	2301130009	KAROLUS SUGI MASAN	OK	Lulus	78	3	Baik	78	3	Baik	39	E
5	2301130011	DZULFIKAR MUHAMAD	OK	Lulus	74	3	Baik	74	3	Baik	37	E
6	2301130013	CLEMENTINA RIA JATA	OK	Lulus	78	3	Baik	78	3	Baik	39	E
7	2301130014	MARTHA AGUSTINA NIFU	OK	Lulus	71	3	Baik	71	3	Baik	36	E
8	2301130015	MARIA PRILA F. YOTI	OK	Lulus	80	3	Baik	80	3	Baik	40	E
9	2301130019	SOLEMAN NAIDJUF	OK	Lulus	72	3	Baik	72	3	Baik	36	E
10	2301130020	BENDITA MARIA LEITE	OK	Lulus	74	3	Baik	74	3	Baik	37	E
11	2301130022	YUSAK B. NENO	OK	Lulus	74	3	Baik	74	3	Baik	37	E
12	2301130023	NMEIDIENSI S. ERENCA TEFA	OK	Lulus	76	3	Baik	76	3	Baik	38	E
13	2301130028	JANUAR NENABU	OK	Lulus	74	3	Baik	74	3	Baik	37	E
14	2301130030	SOSIPATER F. F. LABI	OK	Lulus	72	3	Baik	72	3	Baik	36	E
15	2301130033	JEFRIANUS UN	OK	Lulus	69	2	Cukup	69	2	Cukup	35	E
16	2301130034	FALENTINUS F. M. BETU	OK	Lulus	71	3	Baik	71	3	Baik	36	E
17	2301130035	CHINDY ANGELIA ORA	OK	Lulus	78	3	Baik	78	3	Baik	39	E
18	2301130038	NOVANBRE N. TRISAPUTRA	OK	Lulus	70	2	Cukup	70	2	Cukup	35	E
19	2301130044	INTAN YUNITA BANI	OK	Lulus	77	3	Baik	77	3	Baik	39	E
20	2301130045	GILBERTUS DAPA	OK	Lulus	70	2	Cukup	70	2	Cukup	35	E
21	2301130049	PAKTOMIUS PUTRA ARIFIN NGGAJO	OK	Lulus	74	3	Baik	74	3	Baik	37	E
22	2301130051	YOHANES F. Y. LADO	OK	Lulus	83	4	Sangat Baik	84	4	Sangat Baik	42	E
23	2301130053	TIO E. BOKOS	OK	Lulus	79	3	Baik	79	3	Baik	40	E
24	2301130054	VIRGINIUS SURYA G. R. WALENG	OK	Lulus	71	3	Baik	71	3	Baik	36	E

CPL-1: SANGAT BAIK 1 | BAIK 19 | CUKUP 4 | KURANG 0
CPL-2: SANGAT BAIK 1 | BAIK 19 | CUKUP 4 | KURANG 0

Catatan Perbaikan:
Remedial bagi mahasiswa yang pencapaian CPL yang dibebankan kepada Mata Kuliah masih terkategori 'kurang'

Table 7 Assessment of Graduate Learning Outcomes

No	Nama Penilaian	Metode	CPMK	Bobot %	Sub Total
1	Softskill	Diskusi, seminar, kehadiran	CPL-1	12,5	12,5
			CPL-2	12,5	12,5
2	Tugas	Tugas Terstruktur	CPL-2	7,5	7,5
			CPL-4	7,5	7,5
5	UTS	Ujian/tes	CPL-1	15	15,0
			CPL-2	15	15,0
6	UAS	Ujian/tes	CPL-1	15	15,0
			CPL-2	15	15,0
7	Praktikum	Praktek di laboratorium dan Lapangan	CPL-1	0	0,0
			CPL-2	0	0,0
			CPL-3	0	0,0
			CPL-4	0	0,0
Total				100	100

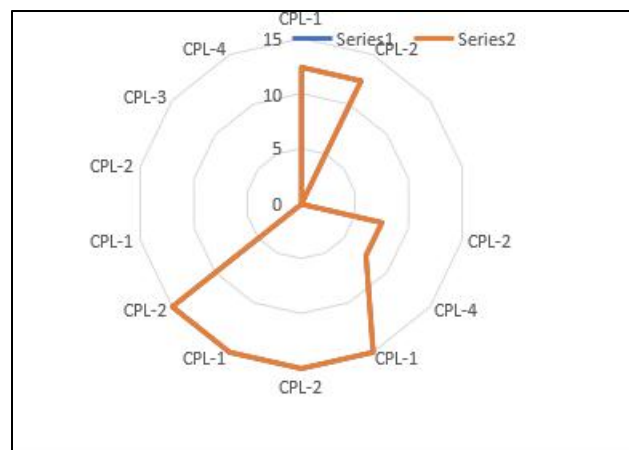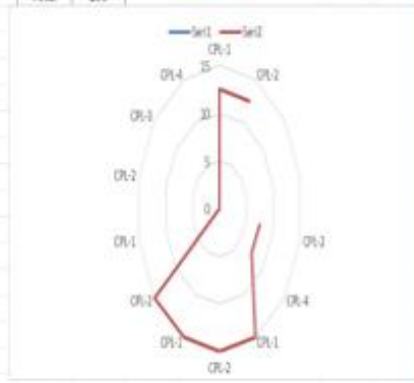| CPL	Bobot %
CPL-2	25
CPL-4	25
CPL-6	25
CPL-8	25
Total	100

Figure 2 Measuring Graduate Learning Outcomes

The assessment techniques used to gauge Graduate Learning Outcomes (CPL) in the Learning and Teaching course are summarized in the table. It emphasizes how the tests are broken down into sections such assignments, midterm exams

(UTS), final exams (UAS), practicum, and soft skills (such as talks and seminars). According to the weight distribution of each CPL, CPL-1 and CPL-2 are given very high priority (15 and 25%, respectively), however CPL-3 and CPL-4 are not evaluated in this course structure. This disparity calls into question the thorough assessment of all targeted competencies. The distribution and application of these judgments are further depicted in the radar graphic. The intended weighting of CPLs is reflected in the "Series 1" plot, where CPL-1 and CPL-2 predominate the assessment structure, suggesting a heavy emphasis on these learning objectives. But CPL-3 and CPL-4 are weightless, so they are eliminated. This raises the question of whether all graduate talents have been developed. With the evidence from experiments employing "Series 2" data, it has been shown that CPLs are indeed functional; further comparison shows a consonance between the goal weight computed for each CPL-2 and finding that in CPL-3 and CPL-4 feature scoring is found largely absent.

Since the CPL-1 and CPL-2 learning objectives might represent a course's key skills or learning objectives, it makes pedagogical sense to focus on them. Neglecting CPL-3 and CPL-4 might not meet more common program-level graduation goals like critical thinking, problem-solving, or professional skills. This also acts as a prompt to broaden assessments so that individuals can develop their skills in multiple areas, instead of remaining focused on rudimentary tasks. In future assessments, caps, group projects, or activities targeting CPL-3 and CPL-4 might be used. Such exercises would be relevant to the goals of the program and help assess students on a level beyond cognitive. As such, a realignment of the course design needs to be considered in order to better align it with program goals and allow for a more equitable distribution among all CPLs. CPL-1 and CPL-2 are measured well by the current evaluation framework, but if neither CPL-3 nor CPL-4 is evaluated, we will have a wide gap. Such inclusive and balanced assessment procedures would give a holistic view of all learning outcomes, thus even enriching the quality of the curricula; ultimately improving societal preparedness through better graduates.
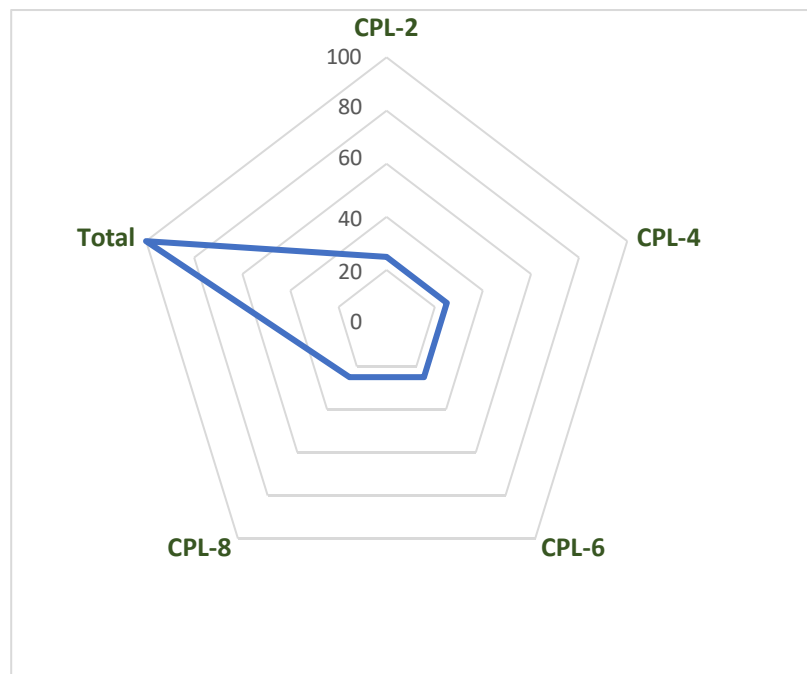

Figure 3 Results of Measurement of Graduate Learning Achievements Charged to the Learning and Teaching Course

The radar graphic highlights differences in proficiency levels across various Graduate Learning The key indicators of CPL are represented by the achievements and accomplishments associated with these domains, which demonstrate how one can calculate CPL in relation to the learning and teaching course. This is contrary to the initial intention of usage of CPL-2 in the simulation. This means that while students show some mastery of specific competencies, with more scaffolded support they might be able to improve those skills.

CPL-4 is recognized as the most competent cohort, with scores greater than 70% in comparison to other cohorts. Given this excellent steerer performance, we could draw the conclusion that the course covers definitely what is needed in terms of skills and knowledge regarding this competency. However, CPL-6 features a markedly lower score of almost 40%, indicating a possibility for development that requires specific pedagogical or curricular adjustments to enhance student performance. We have a striking divergence identified for CPL-8, scoring lowest at 20%.

Thus, it becomes important to ensure that the readings, methodologies, and assessments concerning this competency operationalize appropriately with respect to course objectives. A composite score of about 50% across all CPLs is a reasonable standard of performance, although unsatisfactory. This could indicate a need for targeted improvements in some areas of the CPL, particularly CPL-6 and CPL-8. By correcting these deficiencies through better instructional design and ongoing assessment, the level of proficiency will rise and become more uniform across every metric.

4 CONCLUSION

This study found that the assessment strategy adopted in the Learning and Teaching course is in accordance with the Course Learning Outcomes (CLOs), including content-specific competencies as assigned for course objectives. A systematic assessment of the learning outcomes achieved by the graduates is necessary in order to evaluate how much of the learning objectives were met over the course. Besides overseeing the compliance with necessary competencies, this process also aims to standardize the evaluation of students across their courses. Moreover, the systematic improvement of Graduate Learning Achievements (CPL) and Course Learning Achievements (CLO) assessment should be carried out at all levels of the course in the program. This holistic perspective ensures program goals are continually achieved and that graduates are sufficiently prepared to meet professional demands by defining the broad competency accomplishments anticipated for students. Future research is highly recommended to explore advanced evaluative frameworks which can leverage technology-driven analytics, such as learning analytics and artificial intelligence, to significantly increase the accuracy and efficacy of CPL and CLO assessments. Additionally, longitudinal studies that further examine the progression of competency development over several courses and semesters would shed more light on the growth and cumulative acquisition of learning objectives. Such studies may also look at the correlation between competency performance and graduate employability outcomes in order to improve curricula to meet industry needs.

COMPETING INTERESTS

The authors have no relevant financial or non-financial interests to disclose.

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