

Assessment of Student Achievement using the Cumulative Grade Point Average (CGPA) and the Integrated Cumulative Grade Point Average (ICGPA)

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The cumulative grade point average (CGPA) is a method used to measure the academic performance of students in every university in Malaysia. In the year 2015, the Ministry of higher education (KPT) has introduced an integrated assessment system that is the integrated cumulative grade point average (iCGPA). Through the iCGPA system, student performance reports in terms of the course learning outcomes and program learning outcomes can be represented by the radar graph (spider web). The iCGPA system was implemented at the Faculty of Engineering & Built Environment, Universiti Kebangsaan Malaysia starting from the academic year 2016/2017. The study found that the implementation of iCGPA has improved the assessment of student performance compared to the CGPA system. Therefore, it is recommended to conduct the continuous comparative assessment for both CGPA and iCGPA systems on student academic achievement.

Key words: *Cumulative grade point average (CGPA), integrated cumulative grade point average (iCGPA), Radar Graph, Academic Performance.*

Introduction

Student academic performance plays an important role in the effort to produce quality graduates who will be the leaders and workforce for the country and responsible for economic and social development. Consequently, the performance of students at the University not only attracted the attention of university administrators and lecturers but also industry employees. Academic performance is a cumulative result that illustrates student academic quality. The results should show the learning outcomes of the programme which comprise cognitive and affective skills (York, Gibson, & Rankin, 2015). There are several methods used to measure student academic performance, such as the cumulative grade point average (CGPA), course grades, and tests. In Malaysia, the cumulative grade point average (CGPA) is used to measure student academic achievement. CGPA shows the student academic performance as a whole where it estimates the average of all courses grade for all semesters throughout their studies (Ali, Jusoff, Ali, Mokhtar, & Salamat, 2009).

In the year 2015, the Ministry of higher education (KPT) developed the 2015-2025 higher education development plan (higher education) which aimed to shape a holistic, balanced entrepreneurship character. Among the initiatives of the plan was the implementation of an integrated assessment system where the accumulated grade is integrated (iCGPA). Through iCGPA, the achievement in every programme learning outcome for every student over the period of their studies can be seen (Kementerian Pengajian Tinggi, 2016).

Integrated CGPA (iCGPA) is an integrated mechanism for evaluation and reporting of student achievement and development as well as to gain knowledge about their ethics, knowledge and abilities. The purpose of the implementation of this system is to drive development and coordination in the design and delivery of curriculum and assessment at both the program and the courses, which focus on student learning experience to the holistic and balanced human development (Zahari, Hanafiah, & Hemdi, 2017; Aimer, 2017). The iCGPA report describes student achievement in terms of course learning outcomes and programme learning outcomes that can be viewed on the generated radar graph (spider web).

There are six steps that need to be done in the iCGPA reporting, namely:

- i. Outcome-based curriculum (OBE)
- ii. Plan of course assessment and appropriate assessment methods
- iii. The grade for the course learning outcomes (CO)
- iv. The average value of grade for the Program Outcomes (PO)
- v. Radar graph (spider web) for the average value of grade for the Program Outcomes (PO).

Methodology

Outcome-Based Curriculum (OBE)

In each course, a number of PO will be mapped on to CO involving the three domains of learning, i.e. cognitive, affective and psychomotor. The weight set to achieve each PO is also planned under constructive alignment of curriculum. Table 1 below shows the curriculum plan/matrix for civil engineering programme at Universiti Kebangsaan Malaysia for academic year 2016/2017.

Table 1: The curriculum matrix of the Civil Engineering Program at Universiti Kebangsaan Malaysia

Code	Courses	Relation POs with courses											
		1	2	3	4	5	6	7	8	9	10	11	12
LMCE1002	<i>Foundation English</i> (MUET Band 1 & 2)												
LMCE1012/ LMCE1022	<i>Academic Communication I</i> (MUET Band 3)/ <i>Academic Communication II</i> (MUET Band 4,5 & 6)												
LMCK1621	Ethics and Professional												
LMCRXXX3	Course outside faculty (free course)												
KKKQ1123	Engineering Mathematics II (Algebra)	1	1										
KKKH1243	Computing for Engineers	1				1				1	1		
KKKH1113	Static	1	1										
LMCW1022	Fundamentals of Entrepreneurship and Innovation												
LMCE1012	Academic Communication I (MUET Band 3)												
KKKQ1223	Engineering Mathematics 2 (Linear Algebra)	1	1										
KKKH1213	Geomatics Engineering	1	1			1					1		
KKKH1133	Civil Engineering Graphics	1				1							
KKKH1223	Fluid Mechanics for Civil Engineers	1	1		1					1			
KKKQ2123	Engineering Mathematics 3 (Differential Equations)	1	1										

Code	Courses	Relation POs with courses											
		1	2	3	4	5	6	7	8	9	10	11	12
KKKH2153	Mechanics of Materials	1	1										
KKKH2143	Construction Materials and Technology	1	1	1		1							
KKKH2122	Engineering Mechanics: Dynamics	1	1										
KKKH2113	Geology and Soil Mechanics	1	1		1						1		
LMCE2052	<i>English for Engineering and Architecture</i>												
LMCW2173	Ethnic Relation												
LMCK2922	Soft Skills												
LMCW2163	Islamic and Asian Civilisation												
KKKH2223	Structural Analysis	1	1			1							
KKKQ2023	Engineering Statistics	1	1										
KKKH2213	Environmental Engineering for Civil Engineer	2	2		2			2					
KKKH2233	Engineering Hydrology and Water Resources	1	1	1									
KKKF3283	Engineering Ethics and Technological Advancement						2	1	2	1	1		
KKKH3193	Reinforced Concrete Design	2		2		2				2	2	2	
KKKH3113	Water Distribution System and Sewerage Networks	1		1				1					
KKKH3143	Transport Engineering	1						1		1			1
KKKH3173	Construction Management						1			1			1
KKKH3213	Geotechnics	1	1										
KKKH3323	Numerical Analysis and Computational Methods	1	1			1							
KKKH3333	Highway Engineering	2	2	2		2				2			
KKKH3343	Open Channel Hydraulics		1	1		1		1					
KKKH3353	Structural Steel Design	1		1		1							
KKKF3103	Project Management						1			1			2
KKKF3066	Industrial Training												
LMCE3011 LMCE3021 LMCE3031 LMCE3041	(Choose only one course) <i>Speech Communication</i> <i>Presentation Skills</i> <i>Professional Written Communication</i>												

Code	Courses	Relation POs with courses											
		1	2	3	4	5	6	7	8	9	10	11	12
	<i>Effective Job Search & Application</i>												
KKKH4143	Foundation Engineering		2	2		2				2	2		
KKKH4133	Engineering Economics and Project Evaluation	2								2			2
KKKH4102	Research Project I	2	2		2				2	2		2	
KKKH4013	Integrated Design Project I			2			2	2		2	2		
KKKH4XX3	Elective I												
KKKH4XX3	Elective II												
KKKH4106	Research Project II	2	2		2	2			2	2		2	
KKKH4264	Integrated Design Project II		2	2		2	2	2		2	2		2
KKKH4XX3	Elective III												
KKKH4XX3	Elective IV												

	<i>No relationship</i>
1	<i>Enabling Courses</i>
2	<i>Determinant Courses</i>

Assessment Course Plan and Appropriate Assessment Methods

Development of assessment courses plans needs meet the characteristics of constructive alignment. Table 2 below shows an example of Mechanics of Material (3 credits) course assessment plan and its methods of evaluation.

Table 2: Mechanics of Material course assessment plan

CO No.	CO's Statements	Taxonomy Level	Programme Outcomes	Assessment Method				PO's Total Marks
				Quiz	Tutorial	Mid-Semester Exam	Final Examination	
CO1	Able to explain the fundamental concepts, principles of mechanics of materials and mechanical properties of materials	C2	PO1	5%	5%	-	-	10%
CO2	Able to apply the fundamental concept and principles of mechanics of materials learned to design beam and column	C3	PO2	3%	3%	10%	20%	36%
CO3	Able to analyse structural component using methods learned to find the value of structural deformations, strains, stresses, bending moment, shear stress, torsion and buckling of column	C4	PO1	2%	2%	20%	30%	54%
Total Marks				10%	10%	30%	50%	100%

Course Learning Outcomes Grade

The performance score of every assessment component is used in the grade calculation for each CO. Tables 3 and 4 below show an example of the grade calculation for COs in Mechanics of Material course.

Table 3: Example of detail assessments of COs/POs for KKKH2153 Mechanics of Materials

Bil.	Matric No.	Name	Full Marks	PO1	PO2	PO3	PO1	PO2	PO3	PO2	PO2	PO1	PO1	PO2	PO1	PO2	PO2
				CO1	CO2	CO3	CO1	CO2	CO3	CO2	CO2	CO3	CO3	CO2	CO3	CO3	CO2
				Quiz (Q1)	Quiz (Q2)	Quiz (Q3)	Assignment 1	Assignment 2	Assignment 3	MidSem Exam (Q1)	MidSem Exam (Q2)	MidSem Exam (Q3)	MidSem Exam (Q4)	Final Exam (Q1)	Final Exam (Q2)	Final Exam (Q3)	Final Exam (Q4)
				60	20	20	100	100	100	25	25	25	25	25	25	25	25
1	A152528	SYARIFAH AMIRAH HUDA BINTI SYED MOHD FUAT	45	20	10	90	80	75	10	21	10	15	2	3	10	10	
2	A153052	MOHD NABIL FIKRI BIN ZULKIFLI	31.5	15.5	5.5	95	85	80	23	14	2	11	0	2	6	4	
3	A154026	NUR FASHIHA BINTI MAT RADZI	21	12	2	85	75	70	24	20	17	11	6	3	13	7	
4	A154044	RIDZWAN FENDY BIN JEFRI TAY	54	23	13	100	90	85	23	16	25	14	1	5	13	4	
5	A154919	NURAMALINA EZZATY BINTI MOHD ZUHRY	45	20	10	90	80	75	22	12	17	17	2	5	3	15	
6	A154930	MUHAMMAD ASYRAF BIN AZMAN	45	20	10	100	90	85	17	23	14	8	4	12	13	7	
7	A155115	ROXANNE FOO YUN SHAN	58.5	24.5	14.5	90	80	75	24	18	24	24	4	15	7	4	
8	A155183	FARAH DAYANA BINTI IBRAHIM	46.5	20.5	10.5	90	80	75	24	12	14	15	9	14	6	3	
9	A155272	SABARIAH BINTI MISRAN	48	21	11	90	80	75	24	13	16	16	2	19	10	8	
10	A155417	MUHAMMAD FIRDAUS BIN AB JAMAL	49.5	21.5	11.5	100	90	85	24	8	24	16	0	5	2	10	
11	A155439	AMIER ASYRAF BIN HAMZAH	51	22	12	-	70	65	20	9	21	16	2	6	7	15	
12	A157293	HON CHI KIN	58.5	24.5	14.5	100	90	85	0	22	24	17	25	25	25	25	
13	A157339	LAI KEE LIANG	57	24	14	100	90	85	24	20	23	22	22	18	15	19	
14	A157666	MUHAMMAD IS' AD BIN THAARODIN	49.5	21.5	11.5	100	90	85	7	13	15	2	2	0	9	13	
15	A157927	VICRAAM A/L G.K.KASINATHAN	58.5	24.5	14.5	95	85	80	23	18	11	17	5	8	19	7	
16	A158293	MUHAMMAD ZULHAKIMI BIN KAMARUDDIN	34.5	16.5	6.5	90	80	75	23	12	8	16	2	5	10	10	
17	A158417	MUHAMMAD ZARIQ BIN AWALLUDDIN	18	11	1	95	85	80	8	9	10	6	2	7	2	2	
18	A158439	RURENDHRAN A.I. THAMBIRAJAH	58.5	24.5	14.5	80	70	65	23	12	4	19	2	4	13	17	

Table 4: Calculation of CO grade for Mechanics of Material

CO	PO	Weight × Credit	Components/Assessment Method				Total Marks of CO	Grade of CO	Grade Value
			Quiz	Tutorials/ Assignments	Mid Semester Exam	Final Semester Examination			
1	1	0.1×3 = 0.3	80/100 = 4/5	95/100 = 4.75/5		8.75/10 = 87.50%	A	4	
2	2	0.36× 3 = 1.08	80/100 = 2.4/3	95/100 = 2.85/3	61/100 = 6.10/10	85/100 = 17/20	28.35/36 = 78.75%	A-	3.75
3	1	0.54× 3 = 1.62	80/100 = 1.6/2	95/100 = 1.90/2	61/100 = 12.2/20	85/100 = 25.5/30	41.2/54 = 76.30%	B+	3.33
TOTAL		3.0	WEIGHTED AVERAGE				78%	A-	3.75

Results and Discussion

The Average Grade Value of Program Learning Outcomes

The attained grade value of CO will be summed up by the credit-weight of the course as well as the course mapping with PO. Table 5 below shows an example of the calculation of the average grade value of the POs.

Radar Graph for the Average Grade Value of Program Learning Outcomes

Finally, CGPA for every PO obtained will be displayed in the form of radar graph (spider web) as shown in Figure 1 below.

Figure 1. Radar graph for CGPA

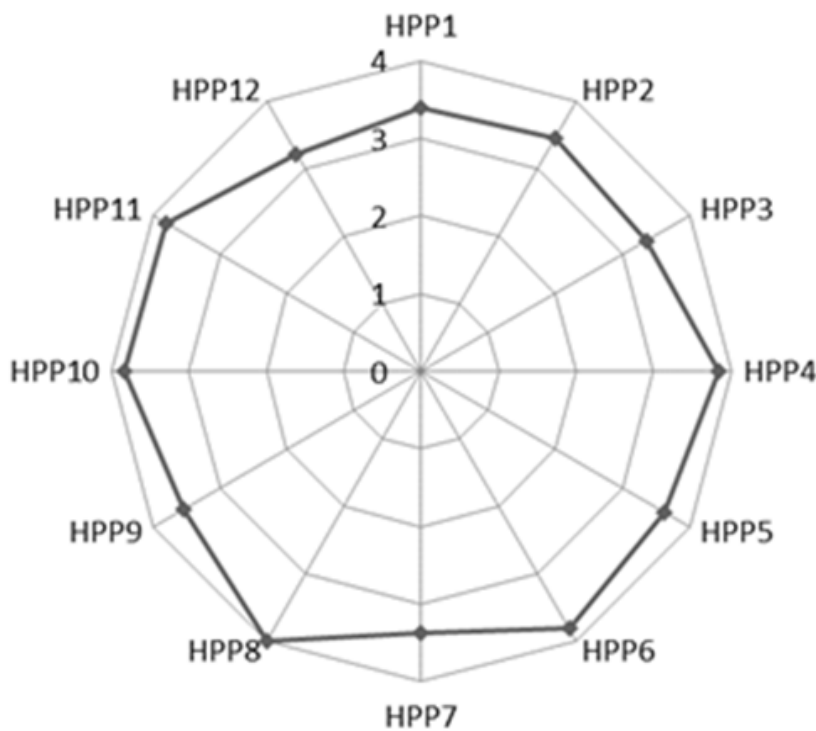


Table 5: The program learning outcomes (PO) grade value

Course Name	Course Learning Outcomes (CO) Grade Value × Credit-Weights											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
KKKH1243 Computing for Engineers	3.33 (1.2)				3.3 3 (1.2)				4.0 0 (0.3)	4.0 0 (0.3)		
KKKH1113 Static	2.67 (1.38)	3.67 (1.62)										
KKKH1213 Geomatics Engineering	3.33 (0.9)	3.67 (1.5)			4.0 0 (0.3)					3.6 7 (0.3)		
KKKH1133 Civil Engineering Graphics	2.00 (1.50)				3.6 7 (1.50)							
KKKH1223 Fluid Mechanics for Civil Engineering	3 (0.56)	3.33 (0.34)							4.0 0 (0.1)			
KKKH2153 Mechanics of Materials	3.67 (1.5)	2.33 (1.5)										
KKKH2143 Technology & Construction Materials	3.33 (1.2)	4.00 (0.9)	1.67 (0.3)		4.0 0 (0.60)							
KKKH2122 Engineering Mechanics: Dynamics	3.00 (0.70)	3.67 (1.30)										
KKKH2113 Geology and Soil Mechanics	3.67 (0.99)	4.00 (1.5)		4.0 0 (0.45)						3.6 7 (0.06)		

Course Name	Course Learning Outcomes (CO) Grade Value × Credit-Weights											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
KKKH2223 Analysis of Structure	4.00 (1.2 0)	3.00 (1.5 0)			4.0 0 (0. 30)							
KKKH2213 Environmental Engineering for Civil Engineer	3.00 (0.3 0)			3.3 3 (0. 60)			3.0 0 (2. 10)					
KKKH2233 Engineering Hydrology and Water Resources	3.33 (1.2 0)	3.33 (1.5 0)	4.00 (0.3 0)									
KKKH3193 Reinforced Concrete Design	4.00 (0.2 4)		2.67 (1.8 6)		3.3 3 (0. 15)				4.0 0 (0. 60)	3.3 3 (0. 06)	3.3 3 (0. 09)	
KKKH3113 Water Distribution System and Sewerage Network	3.67 (0.1 5)		4.00 (2.4 0)				3.6 7 (0. 45)					
KKKH3143 Transportation Engineering	4.00 (1.0 5)						3.6 7 (0. 75)		4.0 0 (0. 45)			3.0 0 (0. 75)
KKKH3173 Construction Management						3.6 7 (0. 75)			3.3 3 (0. 90)			4.0 0 (1. 35)
KKKH3213 Geotechnical	4.00 (1.3 5)	3.33 (1.6 5)										

Course Name	Course Learning Outcomes (CO) Grade Value × Credit-Weights											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
KKKH3323 Numerical Analysis & Calculation Method	3.00 (1.29)	3.33 (1.26)			4.00 (0.45)							
KKKH3333 Highway Engineering	4.00 (0.60)	4.00 (0.60)	3.33 (0.90)		3.33 (0.30)				3.33 (0.60)			
KKKH3343 Open Channel Hydraulics		3.67 (0.75)	3.67 (0.75)		3.33 (0.90)		4.00 (0.60)					
KKKH3353 Steel Structure Design	3.67 (0.66)		3.33 (2.04)		4.00 (0.30)							
KKKH4143 Basic Engineering		3.00 (1.05)	3.33 (1.50)		3.33 (0.30)				3.33 (0.09)	3.33 (0.06)		
KKKH4133 Engineering Economic Evaluation and Project	4.00 (0.60)								4.00 (0.60)			2.67 (1.80)
KKKH4102 Research Project I	4.00 (0.45)	4.00 (0.45)		4.00 (0.45)				4.00 (0.30)	3.33 (0.90)		4.00 (0.45)	
KKKH4013 Design Project I Integrated			3.33 (0.90)			4.00 (0.30)	3.33 (0.90)		3.67 (0.75)	4.00 (0.15)		

Course Name	Course Learning Outcomes (CO) Grade Value × Credit-Weights											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
KKKH4106 Research Project II	4.00 (0.30)	4.00 (0.90)		4.00 (0.90)	4.00 (0.30)			4.00 (0.60)	3.33 (2.70)		3.67 (0.30)	
KKKH4264 Design Integrated Project II		4.00 (0.40)	3.33 (1.20)		3.33 (0.40)	4.00 (0.40)	3.67 (0.20)		3.67 (1.00)	4.00 (0.20)		3.67 (0.20)
Total/Average Weights	3.39 (19.32)	3.47 (18.72)	3.36 (12.15)	3.83 (2.40)	3.62 (7.00)	3.83 (1.45)	3.37 (5.00)	4.00 (0.90)	3.55 (8.99)	3.82 (1.13)	3.81 (0.84)	3.22 (4.10)

Comparisons between CGPA and Integrated CGPA (iCGPA)

CGPA had some similarities as well as differences with an Integrated CGPA (iCGPA). Among the differences that were found is that CGPA is the average of grade value for all courses taken while iCGPA is the average of POs grade value of all courses taken. CGPA is calculated based on grade courses taken for all semester while iCGPA is calculated based on PO grade that is mapped with CO with weights for all semester. Table 6 below shows the example value CGPA, and Integrated CGPA obtained. Although there is a huge difference in values between CGPA and iCGPA, there is one similarity between them, which is, they both are used to assess student academic achievements during their studies.

Table 6: Example results of iCGPA and CGPA for 2016/2017 Student Intake

Student No.	iCGPA according to the PO					iCGPA	CGPA	% Difference
	PO1	PO2	PO5	PO9	PO10			
Weight	5.54	3.46	3	0.4	0.6			
S1	3.37	3	3.47	3.83	4	3.34	3.53	-5.44
S2	3.54	4	3.33	3	4	3.62	3.9	-7.22
S3	3.43	3.4	2.66	4	4	3.29	3.69	-10.89
S4	2.97	2.22	3.7	4	4	3.02	3.23	-6.56

Student No.	iCGPA according to the PO					iCGPA	CGPA	% Difference
	PO1	PO2	PO5	PO9	PO10			
Weight	5.54	3.46	3	0.4	0.6			
S5	3.57	3.1	3.7	3.5	4	3.49	3.65	-4.31
S6	3.6	3.21	3.44	3.25	4	3.47	3.64	-4.75
S7	2.92	1.97	3.44	2.84	4	2.83	2.88	-1.58
S8	3	2.63	3.17	3.5	4	3.00	3.46	-13.23
S9	3.42	2.83	3.6	3.5	3.67	3.32	3.54	-6.26
S10	2.87	2.33	2.67	4	4	2.77	3.4	-18.62
S11	3.54	3.01	3.57	3.83	3.67	3.42	3.59	-4.71
S12	3.16	3.03	3.17	3.25	3.67	3.15	3.61	-12.63
S13	2.8	1.97	3.17	4	3.67	2.74	3.09	-11.28
S14	3.4	2.36	3.7	4	3.67	3.22	3.59	-10.21
S15	3.38	2.85	3.3	4	4	3.27	3.34	-2.15
S16	3.4	2.7	3.3	4	3.67	3.22	3.47	-7.16
S17	3.3	2.67	3.44	3.25	3.34	3.16	3.22	-1.71
S18	3.6	3.18	3.17	2.5	4	3.37	3.45	-2.21
S19	3.55	3.14	2.83	3	4	3.28	3.67	-10.67
S20	3.08	2.98	3.3	3	4	3.14	3.45	-8.87
S21	3.21	3	3.3	3.5	4	3.22	3.46	-6.93
S22	3.35	3.39	3.17	3.5	4	3.35	3.68	-8.87
S23	3.22	2.7	3.3	4	4	3.16	3.57	-11.48
S24	2.69	1.4	3.3	4	3.34	2.56	2.39	7.02
S25	3.7	3.24	3.44	3.83	3.67	3.52	3.65	-3.56
S26	3.4	3.32	3.57	4	4	3.46	3.6	-3.78
S27	3.55	3.14	3.57	4	3.67	3.46	3.66	-5.33
S28	3.16	2.59	2.87	3.25	3.34	2.95	3.15	-6.27
S29	3.59	3.33	3.47	3.5	3.67	3.49	3.66	-4.53
S30	3.61	2.96	3.67	4	3.67	3.47	3.57	-2.92
S31	3.9	3.97	3.53	4	4	3.84	3.92	-2.02
S32	3.17	2.38	3.57	4	3.34	3.09	2.99	3.19
S33	3.5	3.33	3.13	3	3.34	3.35	3.67	-8.81
S34	2.98	2.1	3.27	4	4	2.89	2.97	-2.65
S35	3.51	3.2	3.13	3.33	4	3.36	3.8	-11.66
S36	3.35	3.17	3.13	3.25	4	3.28	3.62	-9.44
S37	3.73	3.51	3.4	4	4	3.62	3.63	-0.38
S38	2.77	1.92	3.13	3.5	4	2.71	2.98	-9.19
S39	3.27	3.15	3.17	3.5	4	3.26	3.71	-12.24
S40	3.37	3.27	3.13	3	3.67	3.29	3.6	-8.60

Student No.	iCGPA according to the PO					iCGPA	CGPA	% Difference
	PO1	PO2	PO5	PO9	PO10			
Weight	5.54	3.46	3	0.4	0.6			
S41	2.69	2.43	3.13	3.83	3.34	2.79	3.38	-17.53
S42	3.49	2.92	3.4	4	3.67	3.34	3.72	-10.17
S43	2.04	1.35	3.17	3.25	3.67	2.23	2.59	-13.92
S44	2.8	1.92	3.4	3.25	3.67	2.76	3.01	-8.36
S45	3.61	3.4	3.53	4	4	3.57	3.93	-9.27
S46	3.72	3.65	2.94	4	3.67	3.53	3.74	-5.68
S47	2.82	2.38	2.7	3.25	3.34	2.71	2.91	-6.79
S48	3.66	3.5	3.53	4	4	3.61	3.79	-4.66
S49	2.5	2.14	3	3.25	4	2.61	3.16	-17.35
S50	3.56	3.23	3.4	4	4	3.47	3.85	-9.89
S51	3.21	3.21	3.57	4	4	3.35	3.62	-7.35
S52	2.96	2.62	2.97	3.25	4	2.93	3.24	-9.61
S53	3.04	3.02	3	3.25	4	3.08	3.41	-9.79
S54	3.47	3.32	3.4	3.5	4	3.44	3.88	-11.36
S55	3.49	3.36	3.1	3.5	3.67	3.37	3.7	-8.81
S56	3.06	2.86	2.83	3.5	4	3.01	3.56	-15.43
S57	3.67	3.86	3.23	3.25	3.67	3.61	3.82	-5.60
S58	2.68	2.44	2.97	4	2.67	2.72	3.07	-11.30
S59	3.6	3.79	3.1	3.08	3.67	3.52	3.86	-8.75
S60	2.9	2.87	2.97	3.5	4	2.98	3.38	-11.91
S61	2.67	2.27	3.1	3.25	3	2.70	3.39	-20.48
S62	2.99	2.73	3.1	4	3.34	2.99	3.15	-4.97
S63	3.44	3.39	3.1	3	4	3.36	3.69	-8.93
S64	2.23	2.2	3.04	3.25	4	2.52	2.98	-15.37
S65	3.33	3.39	3.37	4	4	3.41	3.83	-11.05
S66	2.85	2.79	2.97	3.25	4	2.93	3.28	-10.76
S67	3.12	2.8	2.97	4	4	3.07	3.51	-12.60
S68	3.01	3.28	2.97	3.25	4	3.13	3.45	-9.40
S69	3.09	2.49	2.8	2.5	4	2.89	3.31	-12.77
S70	3.29	3.24	3.23	4	3.67	3.30	3.85	-14.23
S71	2.33	2.54	2.57	2.5	4	2.52	3.14	-19.63
S72	2.82	1.92	3.07	4	3.67	2.71	3.14	-13.58
S73	2.31	1.19	2.67	2.5	1.34	2.06	2.5	-17.76
S74	2.54	2.86	3.1	4	3.67	2.85	3.66	-22.09
S75	3.08	3.08	3.13	3	4	3.13	3.66	-14.44
S76	2.52	2.39	3.23	4	3.67	2.75	3.3	-16.73

Student No.	iCGPA according to the PO					iCGPA	CGPA	% Difference
	PO1	PO2	PO5	PO9	PO10			
Weight	5.54	3.46	3	0.4	0.6			
S77	2.93	3.12	1.33	3.5	4	2.68	3.5	-23.48
Average						3.13	3.45	-9.23

The Impact of these Assessment Systems

Assessment of student achievement using a CGPA and Integrated CGPA (iCGPA) provides a variety of benefits to the educational institution, management programs, lecturers and necessarily, students. In terms of educational institutions, the use of CGPA and iCGPA help to improve the institutional ecosystem in holistically development of the student as an employable graduate. Then, through the use of iCGPA, the management program would be able to monitor the effectiveness and the impact of the design and delivery of the curriculum. In addition, lecturers can monitor the progress of student knowledge and skills on an ongoing basis. Further, lecturers can also make improvements in teaching approach as they monitor the impact on the students and improve the development of knowledge and skills as well as motivate them to pursue excellence in learning at all times.

Conclusion

As a whole, the implementation of iCGPA has improved the assessment of student performance which previously only used CGPA. If previous students can only learn through their cumulative grade CGPA, now with the availability of iCGPA, students can find out the extent of their achievement for each PO. In conclusion, the assessment of the student performance using the CGPA and iCGPA is relative and should be continued.

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