

# eLEAP AND END SEMESTER REPORT SYSTEM FOR TEACHING, LEARNING, AND ASSESSING PROGRAM OUTCOMES IN FACULTY OF ENGINEERING UNIMAS

(Date received: 03.01.23/Date accepted: 28.012.23)

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## ABSTRACT

This paper critically examines the implementation of the e-Learning Enrichment and Advancement Platform (eLEAP) and the End Semester Report (ESR) system in the Faculty of Engineering at UNIMAS, Malaysia, as tools for promoting Outcome-Based Education (OBE), particularly during the COVID-19 pandemic. This paper consists of two (2) sections; firstly is the execution using an online T&L platform called eLEAP and secondly regarding the ESR system for assessing the achievement of Program Outcomes (POs) for the engineering courses in the Faculty of Engineering UNIMAS. By implementing these two systems, it was found that the eLEAP system provided many benefits during the COVID-19 pandemic in Malaysia. Therefore, the T&L process including evaluation was implemented during the tough period of the Movement Control Order (MCO) where students and course instructors were not allowed to come physically to the campus.

**Keywords:** e-Learning Enrichment, End-Semester Report, Engineering Education and Advancement Platform, Program Outcomes, Teaching and Learning

## 1.0 INTRODUCTION

The Faculty of Engineering at UNIMAS has embraced Outcome-Based Education (OBE) as a framework for curriculum design, teaching, and assessment. eLEAP and the ERS are two key technological tools introduced to support the implementation of OBE. OBE emphasizes the importance of clearly defined program and course learning outcomes (PLOs and CLOs) that guide the entire curriculum and assessment process. eLEAP and the ERS are designed to operationalise this approach by mapping the CLOs to PLOs and Program Educational Objectives (PEOs) to ensure alignment between course-level learning and broader program goals. Furthermore, these two tools are used to facilitate data-driven decision-making and improve transparency by providing centralised platforms for managing learning resources, assessments, and student performance data. Also, these systems promote active learning and continuous feedback by encouraging student engagement and personalised learning experiences.

The COVID-19 pandemic forced a global reckoning, prompting educational institutions to re-evaluate their pedagogical approaches. In this transformative period, the Faculty of Engineering at UNIMAS, Malaysia, embarked on a critical journey – transitioning from a traditional learning paradigm to a robust Outcome-Based Education (OBE) framework (Satri *et al.*, 2019), (Ismail *et al.*, 2010), (Pradhan, 2021), (Qadir *et al.*, 2020).

The main objective of this paper is to explore how these systems were utilised to navigate the unprecedented challenges of the pandemic, evaluate POs for engineering courses, and ultimately, contribute to a more robust and adaptable

engineering education at UNIMAS. By examining the successes and challenges encountered during this pivotal period, we aim to shed light on the potential of eLEAP and ERS as not just pandemic solutions, but as cornerstones in the ongoing evolution of engineering education in Malaysia and beyond.

## 2.0 eLEAP SYSTEM

eLEAP stands for e-Learning Enrichment and Advancement Platform. eLEAP is the official online Learning Management System (LMS) used to complement the face-to-face T&L process for all academic programs in UNIMAS. It is designed to cater to the teaching, learning, and assessment processes by providing a platform for faculty members and students to access relevant information and resources. The system aims to enhance pedagogy by addressing the challenge of lack of knowledge and training on appropriate pedagogy for online learning. Furthermore, it seeks to ensure effective class management and prevent submission errors through its online interactive programs. This system is managed by the Centre for Applied Learning and Multimedia (CALM) UNIMAS which deals directly with the T&L function by actively promoting and cultivating excellence and innovation in university teaching through technological integration.

The COVID-19 pandemic forced universities to pivot towards online learning, demanding innovative solutions to bridge the educational gap. In this context, UNIMAS, Malaysia, turned to eLEAP (e-Learning Enrichment and Advancement Platform), its official Learning Management System (LMS). While eLEAP offered valuable support and demonstrated the potential of online

learning, it also highlighted areas for improvement. eLEAP's primary strength lies in its ability to facilitate the transition to online learning. Its platform provided faculty and students with access to essential resources, including course materials, online lectures, and interactive activities. This ensured continuity of education despite physical classroom closures, mitigating the immediate disruption caused by the pandemic. Furthermore, eLEAP addressed the critical challenge of inadequate training in online pedagogy. Its user-friendly interface and readily available resources empowered faculty to adapt their teaching methods to the virtual environment. This, in turn, fostered a more engaging and interactive learning experience for students. Beyond content delivery, eLEAP offered features for effective class management and assessment. Online quizzes, assignments, and project submissions streamlined the evaluation process and minimized submission errors. This allowed faculty to provide timely feedback and maintain a sense of structure in the online learning environment.

Despite its strengths, eLEAP's implementation also revealed some limitations. The digital divide posed a significant challenge, with unequal access to technology and internet connectivity hindering equitable learning opportunities for some students. This exacerbated existing inequalities and highlighted the need for bridging technological gaps to ensure inclusive education. Furthermore, the shift towards online assessments raised concerns about the potential overemphasis on lower-order thinking skills, such as knowledge and comprehension. While eLEAP offered diverse assessment options, designing assessments that effectively evaluate higher-order skills, such as critical thinking and problem-solving, remained a challenge in the online context. Finally, the pandemic significantly increased faculty workload and stress levels. It was adapting to online teaching, mastering new technologies, and managing online assessments added to their existing responsibilities, potentially impacting their well-being and effectiveness. By addressing these challenges, eLEAP can evolve from a pandemic solution to a valuable tool for adaptable and inclusive learning in the digital age, contributing to UNIMAS's pursuit of excellence in education and training. Figure 1 presents the eLEAP dashboard for a course instructor.

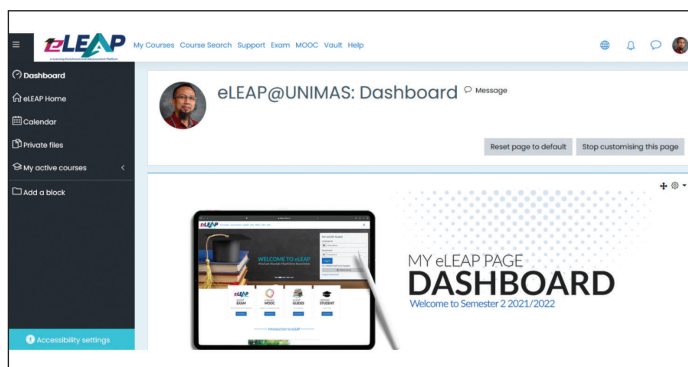


Figure 1: Display of eLEAP UNIMAS dashboard (CALM, 2022)

## 2.1 Setting Up Online Teaching and Learning Sessions

eLEAP has many features that course instructors can use to rapidly set up their online T&L sessions. The course instructor can also embed external tools as part of their online resources

and activities into eLEAP. The four (4) main steps to perform the T&L in the eLEAP system are described as follows.

### 2.1.1 Step 1: Setup the Resources

Learning resources and materials can be uploaded on eLEAP to allow students to learn remotely. Figure 2 shows a list of resources available in eLEAP such as books, files, folders, labels, pages, etc. where the lecture slides, notes, teaching videos and webinars, and other resources like internet sources can be uploaded as resources. The example of resource features uploaded in the engineering courses is shown in Figure 3.

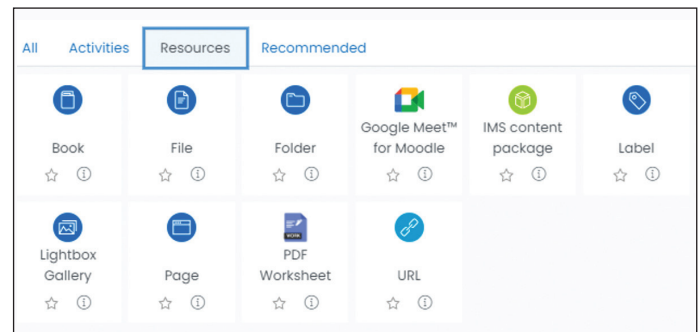


Figure 2: eLEAP UNIMAS Resources Features (CALM, 2022)

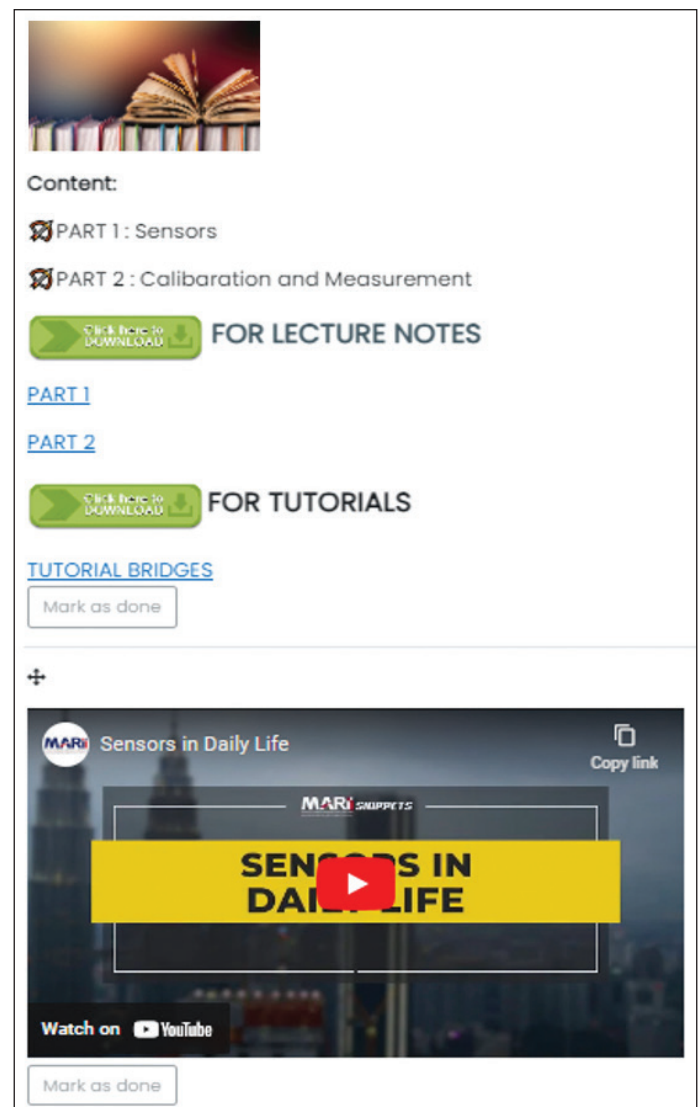


Figure 3: Example of Resources Features in eLEAP UNIMAS (CALM, 2022)

### 2.1.2 Step 2: Setup the Activities

Activities are important for the course instructor to check if students have understood the course content. It is highly recommended to create at least one activity per unit of content.

### 2.1.3 Step 3: Setup the Assessments

Integration of diversity, by adding the graded and ungraded formative assessments to enable a more comprehensive evaluation of student learning mastery.

### 2.1.4 Step 4: Communicate with Students

eLEAP offers promise for transparency and student engagement, but its effectiveness hinges on complementing it with other communication channels. While eLEAP facilitates prompt updates on course materials, schedules, and assessments, relying solely on this platform may not reach all students effectively.

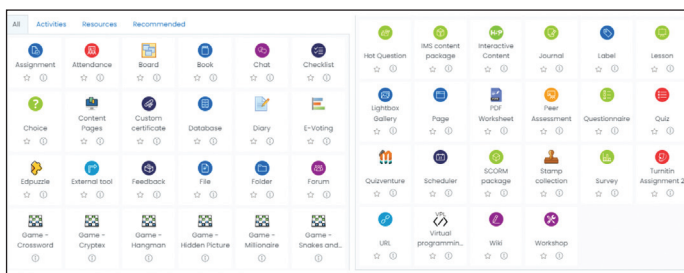


Figure 4: eLEAP UNIMAS Features (CALM, 2022)

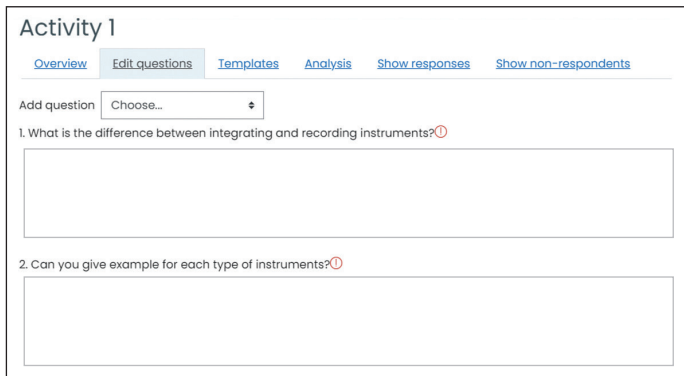


Figure 5: Example activities in eLEAP UNIMAS (CALM, 2022)

User picture	First name	Groups	Date	1. What is the difference...	2. Can you give example for...
	MOHD AMINUDIN BIN ZAINAL		Monday, 17 October 2022, 1:25 PM	Integrating instrument means show the reading when the quantity being measured but not recorded but for recording instruments, they record the measured value on paper for future reference.	Recording instrument - Integrating instrument - ampere hour meter - watt hour meter
	RICHARD LAING		Monday, 17 October 2022, 1:24 PM	Integrating instruments is where the reading taken is going to be converted to desired value. Where as, recording instruments are the readings taken are vary and the readings taken need to be arranged.	- indicating : ordinary ammeters - recording : thermoscope - integrating : ampere per hour meter
	ZUFAYRI BIN JEFFERY LILY		Monday, 17 October 2022, 1:24 PM	Integrating instrument refer to measure and register by a set of dials and pointer where as for recording instruments are to record quantity over a selected period of time.	Indicating instruments : - Ordinary Ammeter Recording instruments : - Thermoscope Integrating instruments : - ampere per hour meter
	DIEXTER SELAMPOR A/K ANDREW NYAMBONG		Monday, 17 October 2022, 1:24	-Integrating is define as measure and register by a set of dials and pointer either the total quantity of electricity or the total amount of	1)Indicating instrument : Ordinary ammeters 2)Recording instrument :Thermoscope

Figure 6: Example responses for activities in eLEAP UNIMAS (CALM, 2022)

Consider exploring alternative methods like personalised emails or online forums to improve reach and foster deeper engagement. Furthermore, eLEAP's potential for immediate clarification and personalised assistance requires active course instructor participation to empower true student engagement. Figure 4 shows all the features provided in the eLEAP system for various resources and activities including assessments which can be utilised during the T&L of any course for a respective academic semester. The examples of activities and sample responses as shown in Figure 5 and Figure 6 respectively. Figure 7 and Figure 8 shows the example of assessments done using the assessment features in eLEAP and sample responses from the students respectively.



Figure 7: Example assessment in eLEAP UNIMAS (CALM, 2022)

	First name	Matric No.	Email address	Faculty	State	Started on	Completed	Time taken	Grade/10.00	Q.1 /5.00	Q.2 /5.00
	MCHAMMAD ADU IRFAN BIN MOHD AZAN	82884	82884@siswa.unimas.my	FK	Finished	18 October 2022 3:29 PM	18 October 2022 3:35 PM	8 mins 18 secs	10.00	✓ 5.00	✓ 5.00
	AHMAD SYAKIR BIN SAPRI	82359	82359@siswa.unimas.my		Finished	18 October 2022 3:29 PM	18 October 2022 3:33 PM	3 mins 52 secs	6.00	✗ 0.00	✓ 5.00
	MCHAMMAD RIJUANESSROCK BIN NASIR	84541	84541@siswa.unimas.my		Finished	18 October 2022 3:29 PM	18 October 2022 3:32 PM	2 mins 42 secs	6.00	✗ 0.00	✓ 5.00
	WILSON HI WEI SIANG	82998	82998@siswa.unimas.my		Finished	18 October 2022 3:29 PM	18 October 2022 3:36 PM	6 mins 41 secs	6.00	✗ 0.00	✓ 5.00
	MUHAMMAD HAZIQ IQBAL BIN JAMIL	82734	82734@siswa.unimas.my		Finished	18 October 2022 3:29 PM	18 October 2022 3:33 PM	4 mins 27 secs	0.00	✗ 0.00	✗ 0.00
	MUHAMMAD DANIEE HUZANIE BIN ROJEE	84671	84671@siswa.unimas.my		Finished	18 October 2022 3:29 PM	18 October 2022 3:34 PM	5 mins 3 secs	6.00	✗ 0.00	✓ 5.00
	MARTIN KENEDY WAN ANAK ALEXANDER TAYLOR	84433	84433@siswa.unimas.my		Finished	18 October 2022 3:29 PM	18 October 2022 3:33 PM	4 mins	6.00	✗ 0.00	✓ 5.00

Figure 8: Example responses for quiz in eLEAP UNIMAS (CALM, 2022)

## 3.0 END SEMESTER REPORT (ESR) SYSTEM

The ESR System was developed and managed by the OBE Unit in the Faculty of Engineering UNIMAS. The ESR system was developed using Microsoft® Excel. Using this system, course instructors may assess their course marks by inserting all necessary marks for carry marks and the final exam, respectively. This system is capable of analysing student achievement including Course Outcomes (COs) and Program Outcomes (POs) achievements in detail including each student's performance. Feedback is encouraged, and regular briefings and training sessions for course instructors are provided to ensure effective system utilisation and OBE awareness.

Figure 9 shows percentages of student achievement for each CO and PO. There are four (4) COs and two POs covered for this course. The threshold for passing COs and POs is 50%. Therefore, the COs and POs for this course were achieved due to the mapping of COs and POs.

Figure 10 and Figure 11 show an example of Cos and POs achievement resulting from the ESR system, respectively. It is observed that the CO1, CO3, and CO4 pass the threshold and achieve meanwhile only 36 % of students did not achieve the CO2. The PO achievement enables the course instructor to evaluate the performance of the students for the respective course. Similarly, PO achievement highlighted that 54 % of students achieved all PO, 3 % did not achieve the PO, and the remaining achieved at least PO for this course.



## PROFILES



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