

# "REVOLUTIONIZING E-LEARNING IN INDUSTRIAL MANAGEMENT: A GROUNDBREAKING EXPLORATION OF IM126 APPS AND UNDERGRADUATE PERSPECTIVES ON THEIR EFFECTIVENESS"

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**Abstract:** *Over the past decade, the internet has provided unprecedented access to education and new skill acquisition through online learning platforms. With the onset of the COVID-19 pandemic, remote working and learning have become the norm for many institutions, necessitating the adoption of online learning methods. Consequently, the IM126 app has been designed and developed by a team of dedicated educators for Industrial Management (MGT 126) students, with the aim of enhancing the e-learning experience through improved interaction and a centralized platform for subject information. This study attempts to evaluate the effectiveness of the IM126 app as a comprehensive resource for Industrial Management information and to explore students' perceptions of the app as a facilitator of e-learning. Employing descriptive analysis through the Statistical Package for Social Science (SPSS) version 25, the study reports several benefits accrued by students from the app, including increased efficiency in document management and a high degree of effectiveness during e-learning sessions. These findings underscore the IM126 app's potential as a model for other subjects and suggest that universities should encourage the development and deployment of similar learning apps to support students and lecturers in navigating the challenges associated with the present era of remote learning.*

**Keywords:** *Revolutionising, Industrial, Management, Application*

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## Introduction

Learning is the process of acquiring knowledge and skills based on individual goals and objectives. With the rapid advancement in technology and numerous innovations, the education industry has been compelled to keep up with the pace by providing reliable information to learners. The proliferation of portable devices such as smartphones, tablets, laptops, and notebooks has underscored the importance of developing e-learning content. Electronic learning, commonly referred to as e-learning, is extensively employed, and most higher education systems operate through it. E-learning constitutes a subset of technology-based learning, comprising websites, learning portals, video conferencing, YouTube, mobile applications, and several free websites for blended educational tools (Shahzad, Hassan, Aremu, Hussain & Lodhi, 2021).

Electronic learning or e-learning has revolutionized the traditional classroom setting by enabling students to acquire information at their own pace, anytime and anywhere. With e-learning, students can revisit the material as often as needed to ensure they understand it thoroughly. Moreover, e-learning has helped students overcome personal challenges that might hinder their classroom attendance and allowed them to follow the class independently through the e-learning system. Technology-driven learning systems have made the learning process seamless for students, reducing their dependence on direct interaction with the instructor. The success of e-learning largely depends on the quality of inputs used to design and implement the system and the users' response to the system (Al-Jedaiah, 2020). Time and distance are no longer barriers to effective teaching, making e-learning an attractive and effective alternative to traditional teaching methodologies.

In contemporary times, traditional teaching approaches are becoming obsolete, and students are increasingly drawn to direct and immediate learning using technology. Multimedia resources such as visual animation, video, audio, and text-based combinations have proven to be more comprehensible and engaging for students. With the evolution of technology, e-learning has become increasingly critical in modern education (Ali, Hossain & Ahmed, 2018). It benefits not only students but also educators in delivering course content and making learning sessions more enjoyable. E-learning enables students in higher education to optimize their time and stay committed to their classes, resulting in improved learning outcomes (Elumalai et al., 2021). The utilization of technology in modern education is crucial, as it enhances the learning experience and promotes more efficient and effective learning.

As traditional knowledge-sharing methods proved to be ineffective and confusing for learners, e-learning emerged as a critical alternative. The unorganized distribution of information often leaves students out of the loop, causing them to miss out on updated information from the study center. The use of different platforms for each subject further compounds the confusion and information overload, resulting in missed important information. However, the preparation of e-learning material presents its own set of challenges, such as students' inability to access the modules or a lack of knowledge of the contents (Bovill, 2020). Hence, this study aims to bridge the knowledge gap regarding the support of e-learning from the undergraduate students' perspective. Specifically, this study seeks to achieve two objectives: 1) to determine the effectiveness of the IM126 application as a one-stop center for Industrial Management subject information, and 2) to explore students' perceptions of the IM126 app in facilitating

the e-learning process. This research highlights the critical need for effective e-learning platforms in higher education, notably in industrial management disciplines. It provides vital insights regarding the IM126 application's efficacy and possible impact on students' learning experiences by assessing it as a centralised hub for topic knowledge. The results have the potential to influence the design and deployment of strong e-learning systems that improve student engagement and knowledge acquisition.

## Literature Review

### E-Learning

Although face-to-face learning has long been considered the most traditional and central approach to education, a significant body of literature has established the efficacy of eLearning for decades (Russell, 1999). Distance learning offers many benefits, including reduced education expenditure, improved test scores, strengthened sense of belonging to the academic community, and collaborative knowledge exchange (Ollesch et al., 2021). The success of distance learning depends on positive student perceptions of perceived barriers such as social interaction, administrative support, student motivation, and time management for studies. Moreover, self-regulation, relevant learning and teaching designs, as well as systematic educational planning play immense roles in the efficiency and effectiveness of the eLearning process (Hodges et al., 2020). By identifying and addressing these factors, educators can maximize the potential of eLearning to provide students with high-quality, accessible, and flexible education opportunities.

Despite the many benefits of online learning, students' negative perceptions toward this method of learning can result in reduced motivation (Kapasias et al., 2020) and lower levels of satisfaction (Maqableh and Alia, 2021) due to reduced engagement, leading to high dropout rates (D'Aniello et al., 2020). Furthermore, mediocre online teaching proficiency and disagreeable instructor personality traits are perceived to have significant adverse impacts on students' performance in the eLearning process (Milic and Simeunovic, 2021).

In addition, the traditional approach to education that relies heavily on distancing or isolation can lead to negative consequences such as a lack of applicability of knowledge and learning processes (Lavy, 2015). Students who come from disadvantaged backgrounds are particularly affected by the limited access to technology, both at home and in school, due to the high costs of internet connectivity. This leads to exclusion, isolation, and inequality in terms of their education (UNESCO, 2020a). These inequalities further complicate the challenges of developing and acquiring new skills, knowledge, and competencies. Homeschooling has also had a significant impact on working parents in terms of their mobility, productivity, job responsibilities, and mental health, as well as the overall economic performance of businesses (UNESCO, 2020b).

The absence of pertinent and suitable infrastructure for distance learning has been closely associated with suboptimal academic performance. Effective distance learning requires not only adequate internet infrastructure, but also proficient course management, application, and excellent pedagogical strategies (Roman and Plopeanu, 2021). In addition, other contextual factors such as gender, ethnicity, and socio-environmental conditions play a crucial role in shaping the effectiveness of distance learning (Nguyen, 2015).

The ongoing global lockdowns due to the COVID-19 pandemic have reinforced the pressing need for creative and dynamic engagement between instructors and students through eLearning tools (Calder et al., 2021). The digitization of education has led to rapid development of innovative apps in the education industry that facilitate the delivery of cutting-edge information and knowledge, thereby enabling a more effective teaching and learning process (Sohail et al., 2021).

### **Effectiveness of Learning Application in Education**

The educational technology industry has recently witnessed a surge in the popularity of learning apps, owing to their unique approach towards providing a tailored learning experience. One such example is Duolingo, a mobile-based platform for language learning, which boasts a user base of approximately 40 million active users per month (Blanco, 2020). Duolingo's success can be attributed to its utilisation of modern learning aids, including gamification and personalised content. It is worth noting that mobile learning and learning apps must be clearly defined before discussing their potential impact on education. Mobile learning refers to the use of portable electronic devices, such as smartphones, tablets, and laptops, for learning in different contexts through social and content exchanges (Hamidi & Chavoshi, 2018; Crompton & Burke, 2018). With the rapid expansion of the mobile device industry over the last two decades, mobile learning has become increasingly feasible through the development of learning apps.

Learning apps have become increasingly popular, particularly on mobile devices such as smartphones, tablets, and watches. These apps span a range of categories, including health, education, productivity, and gaming, as identified by Hamidi and Chavoshi (2018). In this study, we focus primarily on Android and iOS applications, which have seen a dramatic rise in popularity over the past decade. Moreover, the technological advancements of modern mobile devices enable them to be used in a variety of ways.

Arain et al. (2018) conducted a study which found that using mobile learning apps had a positive impact on university students' learning outcomes. Specifically, the study tested the effectiveness of an M-Learning App over the course of one semester in the context of a Communication Skills course. The app was developed for university students to facilitate learning from any location and at any time, using any smartphone. The results showed that students who used the app achieved significantly higher scores than those who did not. This highlights the potential of mobile learning apps to enhance students' learning experiences and outcomes.

Public universities and educational institutions, such as Universiti Teknologi MARA, have been enrolling a significant number of students, ranging between 190,000 to 200,000, for the academic years from 2019 to 2022. As a result, the lack of direct involvement, connection, and interaction between instructors and students has become a pressing issue. The enormity of the student population makes it difficult for instructors to cater to each student's individual learning needs and address their queries during lectures. In response to this challenge, learning applications have emerged as a new trend in education (Dhawan 2020). These applications have a global reach, are user-friendly, and enable easy access to a broad range of subjects.

Learning apps have demonstrated resilience and versatility, and educational institutions are actively developing various mobile learning solutions to support their multiple courses (Talan,

2020; Trifonova & Ronchetti, 2003). The integration of these applications can enhance students' interest and motivation to learn new subjects and can facilitate a pedagogical shift from classroom-based learning to more collaborative and constructivist learning approaches. Furthermore, with the advancement of mobile devices and wireless network technology, e-learning has expanded into mobile learning. Therefore, mobile learning solutions hold great potential to transform the learning experience and provide access to education beyond traditional classroom settings (Basak et al., 2018).

### **Conventional and Modern Method of Teaching**

The ever-evolving technological landscape has resulted in the development of more sophisticated teaching techniques and concepts. It is widely acknowledged that traditional educational methods are no longer sufficient to prepare students for the demands of the modern world. The distinction between the traditional and modern approaches is rooted in three key factors: educational strategy, educational goal, and educational emphasis, as highlighted by Yuemeng Wang (2022).

While traditional teaching methods have been utilized for centuries, it has become evident that a paradigm shift is necessary to cater to the changing needs of learners. Although traditional teaching possesses some undeniable advantages stemming from the use of advanced teaching materials, it often fails to engage students due to its restrictive and passive nature (Shuchi, 2017). According to Hake (1998), students' limited listening abilities contribute to the ineffectiveness of conventional teaching. Listening is the most critical of the four language skills, as it aids in accurate message interpretation. In a traditional setting, teachers are forced to repeat the same information several times, which can lead to students failing to comprehend the message. Moreover, the use of chalk and talk teaching strategies can make it difficult to maintain students' attention for prolonged periods, further reducing its effectiveness. Consequently, innovative teaching strategies are lauded as they enhance student engagement and comprehension.

Furthermore, it is essential to prioritize technological awareness as it enables students to develop their skills and position themselves as competent professionals in the workforce (Shuchi, 2017). Modern teaching techniques offer even greater benefits, including the potential to cater to diverse learning needs, such as special education. However, it is important to acknowledge that modern teaching methods have potential drawbacks that need to be addressed for optimal outcomes. The modern educational paradigm emphasizes the importance of fostering creative thinking among students, as opposed to merely testing their knowledge. Modern education views the teaching and learning process as a highly creative process, with the fundamental goal being to inspire, guide, develop, and train students' creativity (Yuemeng Wang, 2022).

### **Methodology**

The present study is a descriptive investigation that focuses on the efficacy of e-learning in Industrial Management (MGT 126) among 49 undergraduate students enrolled in the Faculty of Wood Technology during their final semester. As the students had all taken this code as part of their compulsory program, participation was mandatory. The data were collected through a self-administered questionnaire consisting of 10 questions, distributed via a Google form link. The questionnaire was divided into two parts: Part A evaluated the effectiveness of e-learning in the lesson, while Part B consisted of items assessing application attributes. Additionally, an open-ended question soliciting comments and suggestions for improvement



was included. Descriptive statistics were employed to analyze the quantitative data using Statistical Package for Social Science (SPSS) version 25.

### The Development of Apps

The Industrial Management (MGT126) application, also known as IM 126, was developed to support students and lecturers in teaching and learning this subject. With the ongoing COVID-19 pandemic since March 2019, educators have been challenged to find effective and efficient ways of delivering course materials to students. In response, the IM 126 application was developed on the Adalo platform to ensure a seamless learning experience and provide all necessary components for mastering the MGT 126 subject matter. These components include lesson plans, to-do lists, notes, past exam questions, as well as supplementary materials such as quizzes and activities.

At the beginning of the semester, students are provided with a link to download the app on their mobile devices or gadgets, enabling them to access the syllabus' lesson plan and to-do list at their convenience. The application also offers updated handouts and samples of final examination questions, while online quizzes and engaging gamification activities enable students to test their comprehension of each chapter. Moreover, the app streamlines the submission and grading process of assignments specifically for this subject, providing lecturers with ease in finding and grading them.

Our observations reveal that students appreciate the IM 126 application, as it provides a secure storage platform for their essential documents, effectively addressing issues of misplaced or missing softcopies. Overall, the application offers an innovative solution to challenges posed by the pandemic, allowing students to access and learn the course materials effectively and efficiently.

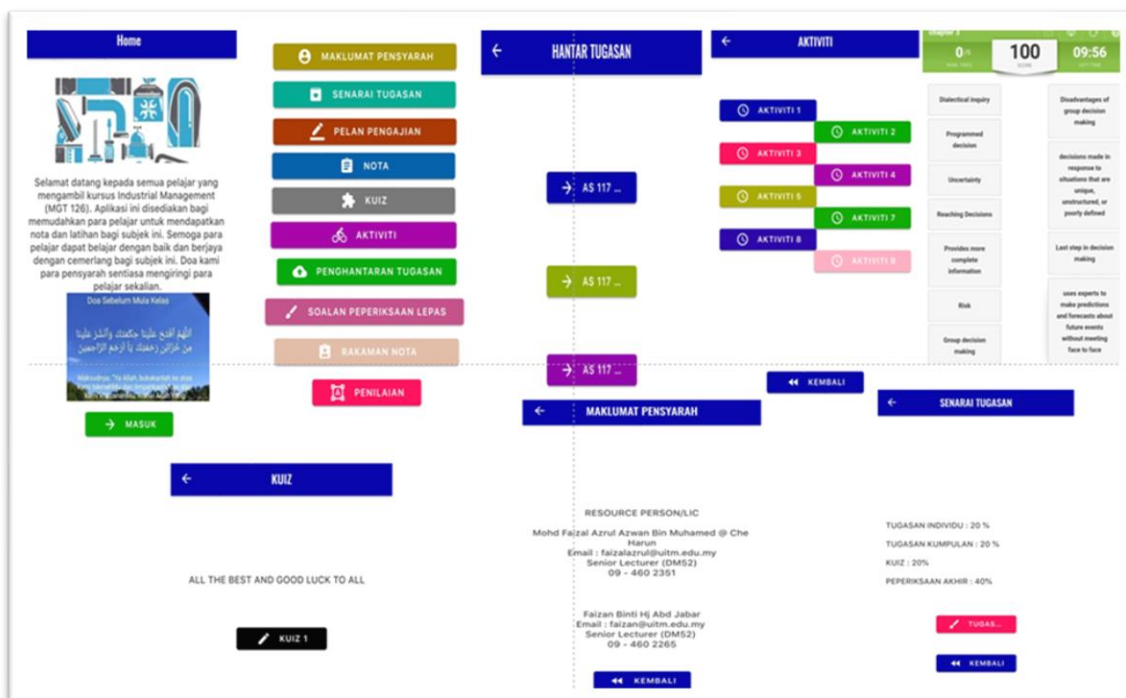


Figure 1: The Application's Features

## Result and Discussion

Descriptive statistical analysis was employed to ascertain the gender-wise participation of students in the IM126 application. The findings reveal that 59% of female students and 41% of male students have utilized the app. These students belong to Semester 5, which represents the final year of their academic program and have previously engaged in the traditional method of learning.

**Table 1: Respondents' Gender**

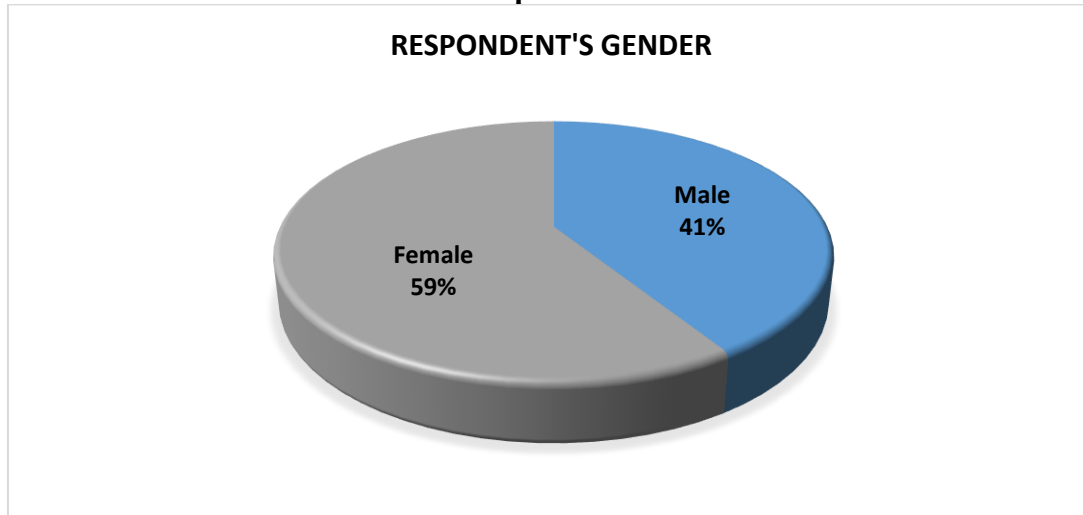


Table 2 shows the students' perception of the effectiveness of IM126 apps during E-learning lessons. Majority show  $M = 4$ ;  $SD = .4$ , which indicates it is reliable. Students gave good responses on the test games included in the apps. Specifically, the students responded positively to the test games integrated into the app, expressing a desire for more engaging games that match their skill level. They also acknowledged the app's role in streamlining assignment submission and centralizing course information, which was especially convenient for them since they often lost hard and soft copies of important documents. The students found the app user-friendly and easy to navigate, thereby contributing to its success. The study's results highlight the importance of incorporating creative and dynamic E-learning tools to engage both instructors and students, as evidenced by this research (Calder et al., 2021).

**Table 2: Student Perspective on the Effectiveness of IM126 Apps**

	N	Mean	Std. Deviation
Suitable Comprehension Test Game	49	4.5714	.50000
Easy to submit assignments.	49	4.6939	.46566
Helps store subject information virtually	49	4.6735	.47380
User-Friendly	49	4.6122	.49229

Table 3 presents a gender-based analysis of the attributes of IM126 apps. Out of the 24 female respondents, the majority strongly agree that the app is simple and well-organized, while only 9 male respondents agree with this statement. This implies that the app needs to improve its

content arrangement and organization. However, the majority of respondents from both genders agree that the app makes it easy for them to find information, which is consistent with our observation in class. When asked to search for information on the app, students were able to find it quickly. Nevertheless, some students expressed that the app's layout could be improved to be more attractive and colorful.

Most female respondents also agreed that the app contains attractive activities, whereas fewer male respondents strongly agreed with this statement. The latter group desired more test games to aid their understanding, which we acknowledge as app developers, but it was not feasible due to time constraints. However, we plan to regularly update and add more activities to the app. As affirmed by Elumalai et al. (2021), apps can enhance the delivery of academic content and make learning sessions more enjoyable. Finally, the majority of both male and female respondents agreed that this app is a central hub for all the information they need for this code, which saves them from losing important information and allows them to keep track of their grades through the app.

**Table 3: Comparison Perspective of IM126 Apps by Gender**

Item	Scale	Gender		Total
		Male	Female	
<b>Simple and organised</b>	4.00	11	5	16
		68.8%	31.3%	100.0%
		55.0%	17.2%	32.7%
	5.00	9	24	33
		27.3%	72.7%	100.0%
		45.0%	82.8%	67.3%
<b>Easily find information</b>	4.00	11	7	18
		61.1%	38.9%	100.0%
		55.0%	24.1%	36.7%
	5.00	9	22	31
		29.0%	71.0%	100.0%
		45.0%	75.9%	63.3%
<b>Attractive layout</b>	3.00	2	0	2
		100.0%	0.0%	100.0%
		10.0%	0.0%	4.1%
	4.00	6	9	15
		40.0%	60.0%	100.0%
		30.0%	31.0%	30.6%
	5.00	12	20	32
		37.5%	62.5%	100.0%
		60.0%	69.0%	65.3%
<b>Contains attractive activities</b>	4.00	11	7	18
		61.1%	38.9%	100.0%
		55.0%	24.1%	36.7%
	5.00	9	22	31



			29.0%	71.0%	100.0%
			45.0%	75.9%	63.3%
<b>Contains information</b>	<b>important</b>	4.00	10	5	15
			66.7%	33.3%	100.0%
			50.0%	17.2%	30.6%
		5.00	10	24	34
			29.4%	70.6%	100.0%
			50.0%	82.8%	69.4%

### Conclusion and Recommendation

This app serves as a central hub for information on MGT 126, allowing students to access information quickly and efficiently while also saving storage space on their devices. As Bovill (2020) suggests, modern learning technologies offer the potential to centralize information and prevent important information from being missed. By storing all the necessary documents and activities in the cloud, this app is compatible with a range of softcopy documents and software activities, enabling smooth integration into E-learning. Respondents were unanimous in their agreement that the app is effective for E-learning due to its ease of use, reachability, and storage-saving capabilities, as well as its user-friendliness ( $M \geq 4$ ). They also found the app's attributes, such as simplicity, organization, and attractiveness, to be highly beneficial, especially when it comes to testing their comprehension through the engaging games. However, as noted by Arain et al. (2018), there is still room for improvement, particularly in terms of organization, colors, icons, and layout, to make the app even more engaging and appealing to users. The developers should also add more fun games and refine existing ones to ensure that they accurately reflect the level of difficulty and help students gauge their comprehension effectively.

The present study provides robust evidence that students tend to favor engaging and interactive learning experiences. The findings suggest that pedagogical strategies that incorporate fun elements can have a positive impact on student motivation, learning outcomes, and satisfaction. As such, it is recommended that educators incorporate such approaches in their teaching practices. Furthermore, the study underscores the potential of educational apps to transform the learning landscape by offering innovative and effective ways of delivering content. The use of educational apps is poised to revolutionize traditional educational practices and holds great promise for enhancing learning outcomes. It is recommended that educators take advantage of this trend and incorporate educational apps in their teaching practices. Additionally, the study findings suggest that the app used in this study could be a useful model for creating similar apps for other subjects. Further research could investigate the effectiveness of such apps in different subject areas and learning contexts.

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