Journal of Creative Practices in Language Learning and Teaching (CPLT)
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EXPLORING EDUCATION IN THE DIGITAL AGE: INNOVATIONS, INTERSECTIONS AND INSIGHTS

PREFACE

Dear esteemed readers and contributors,

It is with great pleasure and excitement that I extend a warm welcome to you all to this special edition of our journal, dedicated to exploring the diverse and dynamic themes shaping the landscape of education in the digital era. As we embark on this journey of discovery, each theme serves as a guiding beacon, illuminating the innovative intersections of technology and pedagogy.

Our first theme, Teaching based on Artificial Intelligence (AI), Machine Learning (ML), and the Internet of Things (IoT), sets the stage for our exploration by delving into the transformative potential of intelligent technologies in education. From personalized learning experiences to predictive analytics, AI, ML, and IoT hold the promise of revolutionizing traditional teaching methods and unlocking new pathways to knowledge acquisition.

Theme 2 invites us to immerse ourselves in the realm of 360 Learning, Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR). Here, we witness the fusion of physical and digital worlds, as learners embark on immersive journeys that transcend the confines of the traditional classroom. Through experiential learning and interactive simulations, VR, AR, and MR technologies redefine the boundaries of education, offering unprecedented opportunities for engagement and exploration.

In Theme 3, we explore the power of Collaborative Teaching, Global Learning, and innovative practices such as Gamification, Maker-Space, and Maker Lab initiatives. This theme underscores the importance of collaboration, cultural exchange, and hands-on experimentation in fostering creativity, critical thinking, and problem-solving skills among learners worldwide.

Theme 4 sheds light on the paradigm shift towards Open and Distance Learning (ODL), Self-Instructional Materials (SIM), and the utilization of Big Data Analytics in Learning. Here, we witness the democratization of education, as learners gain access to high-quality resources and personalized learning experiences irrespective of geographical constraints. Big Data analytics further enhance the educational landscape by providing insights into learner behavior and preferences, enabling educators to tailor instruction to individual needs.

In Theme 5, we explore the evolving role of Social Media Learning as a catalyst for knowledge dissemination, collaboration, and community building. From online forums to multimedia platforms, social media offers a dynamic space for peer-to-peer learning, digital literacy development, and the cultivation of virtual learning communities.

Theme 6 invites us to embrace Design Thinking for new Learning Delivery, emphasizing the importance of user- centered design principles in creating innovative and inclusive learning experiences. Through empathetic design, educators can reimagine learning environments that foster creativity, adaptability, and lifelong learning skills.

In Theme 7, we delve into Andragogy in technology-based learning, Instructional Design, and Best Practices in e-learning. This theme highlights the importance of learner-centered approaches, effective instructional design strategies, and the dissemination of evidence-based practices to optimize learning outcomes in the digital age.

Finally, Theme 8 explores the Development of e-learning systems, materials, and mobile technologies, including the emergence of MOOC-based mobile learning materials. Here, we witness the evolution of educational technologies, as mobile devices and online platforms redefine the boundaries of access and engagement in education.

As we navigate through these diverse themes, let us embrace the spirit of inquiry, collaboration, and innovation that defines our scholarly community. I extend my deepest gratitude to all the contributors who have enriched this journal with their insights and expertise. May this edition inspire new ideas, spark fruitful discussions, and contribute to the ongoing dialogue surrounding the future of education.

Thank you for your dedication and commitment to advancing the frontiers of knowledge in the field of education.

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Theme 7: Andragogy in technology-based learning/Technology in learning/Instructional design in learning/Best practices in e-learning

1. Challenges and Innovations: Adapting Practical Culinary and Foodservice Subjects for Distance Learning during COVID-19
2. Exploring Tertiary Education ESL Learners' Dependency on the Internet, Internet Sources, and Internet Source Reliability

Theme 8: Development of e-learning system/Development of e-learning materials/Development of mobile systems in Learning/Development of MOOC-based mobile learning materials

1. Student Acceptance with the Usage of Padlet in Guiding Research Statistics Analysis
2. MOOC Courses Development: Guidelines for GLAM MOOC

Guest Editors

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Factors Influencing the Internet of Things (IoT) Implementation in Fieldwork Courses

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ABSTRACT

The integration of Internet of Things (IoT) technologies into education needs to be effectively harnessed to complement the learning process and cultivate industry-ready graduates. This study aims to identify the critical factors influencing the implementation of IoT in fieldwork courses and to determine the relationship between these factors and IoT implementation. A sample of 156 students was randomly selected from 250 undergraduate students enrolled in the fieldwork courses at the Faculty of Plantation and Agrotechnology, UiTM Melaka Branch, Jasin Campus, UiTM, Malaysia. Data were collected using a close-ended questionnaire and analysed for descriptive statistics, multiple regression analysis, and correlation analysis using SPSS version 27. The results showed that all factors significantly influenced the implementation of IoT in fieldwork courses (p-value < 0.05). Multiple regression analysis indicated that the most critical factor is curriculum alignment (p-value < 0.05; standardised β-value = 0.634), compared to faculty development and training, infrastructure and resources, and industrial collaboration, with a strong correlation between the variables ($R = 0.722$). The R^2 value of 0.521 indicates that 52.1% of the dependent variable (implementation of IoT) is explained by the independent variables, while 47.9% is explained by non-studied factors. All factors have a linear positive relationship with IoT implementation (p-value < 0.05). Based on the factors identified in this study, it is suggested that subsequent research should emphasise the integration of IoT into curriculum alignment to enhance learning experiences and align curricula with evolving industry demands.

Keywords: Agrotechnology, fieldwork, Internet of Things (IoT), plantation

INTRODUCTION

The proliferation of digital technologies in recent decades has reshaped the landscape of various industries and sectors, heralding the era of the Internet of Things (IoT). The IoT, characterised by interconnected devices and systems that communicate and exchange data seamlessly, has shown remarkable potential to revolutionise traditional practices and enhance operational efficiency across diverse domains (Laghari et al., 2021). One such domain that stands to benefit from IoT integration is plantation management, where the effective utilisation of IoT can lead to significant advancements in monitoring, data collection, and decision-making processes (Sindhwani et al., 2022). In the context of higher education institutions, the integration of IoT technologies has become a subject of growing interest, particularly in the design and implementation of fieldwork courses. The synergy between academia and industry demands a progressive approach to curriculum development, one that embraces emerging technologies to equip students with relevant skills and competencies for real-world challenges (Tavera Romero et al., 2021). This is especially true for programmes like plantation management and agriculture, where hands-on experience and practical exposure are integral components of the learning process (Ramchunder & Ziegler, 2021), sometimes beginning as early as the secondary school period in various countries (Shabani et al., 2023; Njura et al., 2020). Based on previous studies, some key factors driving the successful implementation of fieldwork studies in various fields are as follows:

Curriculum Alignment

Curriculum alignment refers to the process of harmonising the integration of Internet of Things (IoT) technologies with the existing curriculum goals and learning objectives (Marshall, 2005). This ensures that the incorporation of IoT tools, devices, and concepts directly supports and enhances what students are expected to learn from the programme. This alignment is a pivotal factor in the successful integration of IoT into fieldwork courses, as it ensures that technological enhancements contribute meaningfully to the broader educational objectives (Ertmer, 2005).

Faculty Development and Training

Faculty development and training are essential components of successfully integrating Internet of Things (IoT) technologies into fieldwork courses (Haleem et al., 2022). Educators play a pivotal role in shaping students' learning experiences, and their ability to effectively utilise IoT tools can significantly impact the quality of education provided (Bednar et al., 2013; McKee et al., 2015). Adequate training and professional development opportunities are crucial to empower educators with the skills, knowledge, and confidence needed to seamlessly incorporate IoT technologies into their teaching methods (Bingimlas, 2009; Ratheeswari, 2018).

Infrastructure and Resources

Creating a conducive environment for the successful implementation of Internet of Things (IoT) technologies in fieldwork courses requires careful consideration of the necessary infrastructure and resources. Adequate technological support is essential to ensure that IoT devices and tools function effectively (Elijah et al., 2018), enabling educators and students to harness the full potential of these technologies in the learning process. Having the right infrastructure and resources is a fundamental pillar of successful IoT implementation in the Plantation Management Programme's fieldwork courses.

Industrial Collaboration

Engaging in collaborative partnerships with industry stakeholders is a critical success factor for the effective implementation of Internet of Things (IoT) technologies in fieldwork courses for academic programmes. Industrial collaboration bridges the gap between academia and the real-world demands (Fleming & Haigh, 2017), enriching the educational experience and preparing students for the complexities of modern industry practices (Chen et al., 2016). Building relationships with industry partners can lead to internships, job placements, and mentorship opportunities, enhancing students' employability and helping them establish a foothold in the industry (Farooq et al., 2019). Through engagement with industry partners, a feedback loop that informs curriculum development and improvement can be created. Input from industry experts helps educators tailor the curriculum to align with industry needs, ensuring that graduates are well-prepared to meet the demands of the workforce. In addition, collaboration with industry reinforces the relevance of the education being provided (Dick & Jones, 1995; Costa et al., 2021).

Therefore, exploring the factors that underpin the implementation of IoT in fieldwork courses within the framework of the Plantation Management Programme at Universiti Teknologi MARA (UiTM) holds significant promise for enriching the educational experience and preparing students for a technologically driven professional landscape. As such, the objectives of this study are to identify the critical factors that influence the implementation of IoT in fieldwork courses for undergraduate students in the Faculty of Plantation and Agrotechnology of UiTM, and to determine the relationship between these factors and IoT implementation. By investigating the critical factors that drive successful implementation, this study may contribute valuable insights to educators, administrators, and policymakers engaged in curriculum enhancement and educational innovation.

METHOD

In this study, a sample of 156 students was randomly selected from 250 undergraduate students enrolled in fieldwork courses at the Faculty of Plantation and Agrotechnology, UiTM Melaka branch, Jasin campus, Malaysia. The questionnaire was distributed via an online Google form and consisted of six sections: demographic information, general knowledge on IoT, curriculum alignment (Factor 1), faculty development and training (Factor 2), infrastructure and resources (Factor 3), and industrial collaboration (Factor 4). Feedback from respondents was statistically analysed using SPSS version 26. Initially, the general information was descriptively analysed to identify the level of knowledge on IoT among respondents. Then, regression analysis was conducted to determine the most critical factors influencing IoT implementation in fieldwork courses among the students, and finally, Pearson correlation analysis was used to examine the relationship between respondents' knowledge and the factors.

RESULTS AND DISCUSSIONS

Reliability analysis

The reliability of the Likert scale used in the questionnaire was assessed using Cronbach's alpha to confirm the internal consistency and reliability of the survey set. As shown in Table 1, the reliability analysis yielded a Cronbach’s Alpha value of 0.949, indicating strong reliability of the survey set used in this study.

Table 1. Cronbach’s Alpha of The Survey Set

Reliability Statistics	
Cronbach's Alpha	N of Items
0.949	35

Demographic details
Table 2 summarises the demographic details of the respondents in this study.

Table 2. Demographic Details of the Respondents

Demographic profile	Category	Frequency	Percentage (%)
Gender	Male	95	60.9
	Female	61	39.1
Age Group	18-20 years old	135	86.5
	21-23 years old	20	12.8
	Above 27 years old	1	0.6
Education level	Diploma	138	88.5
	Bachelor's degree	18	11.5
Programme	AT110	138	88.5
	AT220	12	7.7
	AT222	2	1.3
	AT223	1	0.6
	AT228	3	1.9
Current Semester	Semester 1	65	41.7
	Semester 2	78	50
	Semester 3	7	4.5
	Semester 4	6	3.8
Fieldwork course	FPA100	63	40.4
	FPA150	70	44.9
	FPA200	6	3.8
	FPA450	10	6.4
	FPA500	3	1.9
	AGA422	4	2.6

Table 2 shows that 61% of the respondents are male, and 39% are female. Approximately 86.5% of the respondents are aged 18-20 years old. About 88.5% of the respondents are at the diploma level of education and are enrolled in the Diploma in Planting Industry Management (AT110) Programme. Most of the students are currently in Semester 2 (50%) and Semester 1 (41.7%), enrolling in the fieldwork course codes of FPA150 and FPA100, respectively.

General Knowledge of the Respondents
Table 3 presents the descriptive analysis of the general knowledge of the respondents on the implementation of IoT in fieldwork courses.

Table 3. General Knowledge of the Respondents about IoT Implementation

	N	Mean	Std. Deviation
I am familiar with the concept of Internet of Things (IoT).	156	3.4808	0.82283
I am able to define the Internet of Things (IoT) in my own words.	156	3.3269	0.81251

I apply IoT in learning processes such as the application of software, sensors, unmanned tractors, etc.	156	3.3462	0.89913
I believe that the Internet of Things (IoT) can improve the quality of education.	156	3.9679	0.85323
The Internet of Things (IoT) has a positive impact on student learning outcomes.	**156**	**3.9744**	**0.87214**

The descriptive analysis based on the five items in the general knowledge scale shows that respondents agree that the implementation of IoT positively impacts student learning outcomes (μ = 3.9744, SD = 0.87214). Figure 1 illustrates the frequency distribution, with 91 respondents (58.3%) agreeing (scale 4) with the statement.

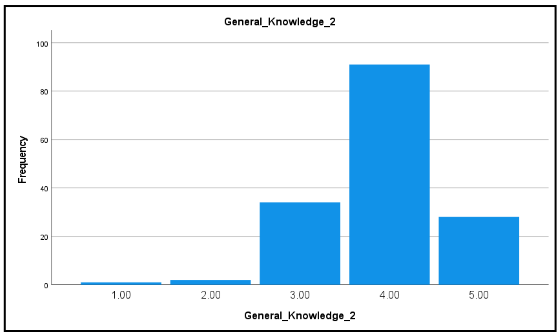

Figure 1. Frequency Chart for General Knowledge on IoT Implementation

Curriculum Alignment
Table 4 provides the descriptive analysis of the curriculum alignment factor.

Table 4. Descriptive Analysis of Curriculum Alignment Factor

	N	Mean	Std. Deviation
I learned about IoT in the fieldwork class session.	156	3.4551	0.86765
I believe the implementation of IoT in course content aligns with learning objectives.	156	3.6923	0.77556
I received exposure to IoT applications during learning activities, assignments, and projects.	156	3.6154	0.82275
I have been exposed to IoT hardware and software tools during fieldwork activities.	156	3.5385	0.82215
My course syllabus provides hands-on experience or practical exercises related to IoT.	156	3.4551	0.79792
I applied IoT tools and device in fieldwork activity.	156	3.4487	0.94558
I believe the knowledge on IoT applications can foster critical thinking and decision-making skills.	156	3.8077	0.77139
Excellent IoT soft skills can provide opportunities to engage with real-world data and increase student employability.	**156**	**3.8718**	**0.76806**

The analysis based on the eight items in the curriculum alignment scale shows that respondents agree that excellent IoT soft skills provide opportunities to engage with real-world data and increase student employability (μ = 3.8718, SD = 0.76806).

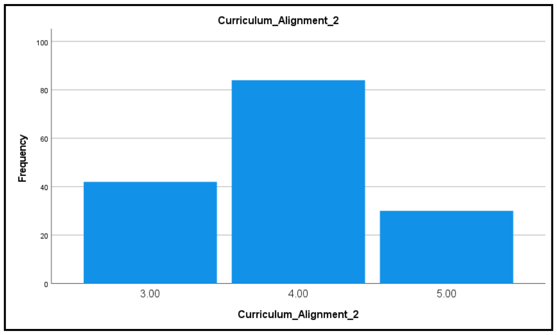

Figure 2. Frequency Chart for Curriculum Alignment Factor

Figure 2 illustrates the frequency distribution, with 84 respondents (53.8%) agreeing (scale 4), and 30 respondents (19.2%) strongly agreeing (scale 5) with the statement.

Faculty Development and Training

Table 5 presents the descriptive analysis of the faculty development and training factor.

Table 5. Descriptive Analysis of Faculty Development and Training Factor

	N	Mean	Std. Deviation
The faculty provided adequate training and development about IoT to the students.	156	3.5577	0.81312
I am aware of new training or courses about IoT handled by the faculty.	156	3.5321	0.75707
Training on IoT was conducted in accordance with fieldwork requirements.	156	3.5513	0.79754
Lecturers always equipped students with IoT implementation during fieldwork activities.	156	3.5513	0.85228
I am satisfied with the frequency of IoT training provided by the faculty.	**156**	**3.5897**	**0.83374**

The analysis based on the five items shows that respondents agree that they are satisfied with the frequency of IoT training provided by the faculty (μ = 3.5897, SD = 0.83374). Figure 3 illustrates the frequency distribution, with 73 respondents (46.8%) agreeing (scale 4), and 27 respondents (17.3%) strongly agreeing (scale 5) with the statement.

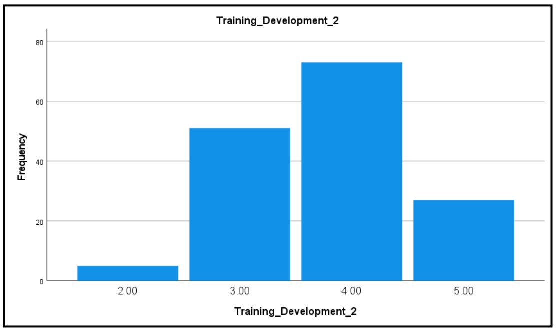

Figure 3. Frequency Chart for Faculty Development and Training Factor

Infrastructure and Resources

Table 6 presents the descriptive analysis of the infrastructure and resources factors.

Table 6. Descriptive Analysis of Infrastructure and Resources Factor

	N	Mean	Std. Deviation
Infrastructure support on campus is adequate for fieldwork activities such as greenhouse, nursery, lysimeter, etc.	156	3.859	0.74008
There is a high-speed network connection on campus for the learning process.	156	3.6731	0.90278
A good internet connection influences the quality of my learning processes.	**156**	**4.0128**	**0.81111**
IoT tools are always available for students to use during fieldwork activities.	156	3.6538	0.83205
During fieldwork operations, I have easy access to IoT tools such as software and hardware.	156	3.5192	0.79896
I am satisfied with the IoT infrastructure and resources on campus.	156	3.6603	0.79917

The descriptive analysis in Table 6 shows that respondents agree that a good internet connection influences the quality of learning processes (μ = 4.0128, SD = 0.81111). Figure 4 illustrates the frequency distribution, with 80 respondents (51.3%) agreeing (scale 4), and 38 respondents (24.4%) strongly agreeing (scale 5) with the statement.

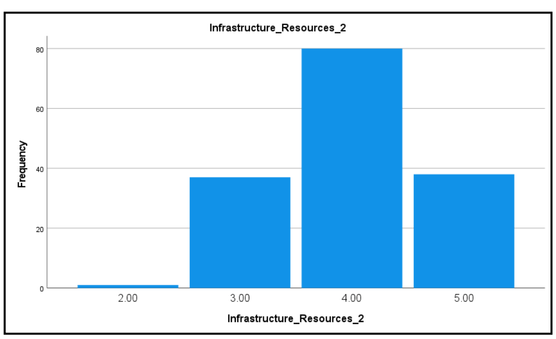

Figure 4. Frequency Chart for Infrastructure and Resources Factor

Industrial Collaboration
Table 7 presents the descriptive analysis of industrial collaboration factors.

Table 7. Descriptive Analysis of Industrial Collaboration Factor

	N	Mean	Std. Deviation
Industrial collaborations are important in fieldwork activities.	156	3.9487	0.7687
Industrial collaborators involved in field work sessions by delivering talks and seminars.	156	3.859	0.78246
Industrial collaboration provides the latest input and information related to IoT.	156	3.8333	0.78562
Collaborative teaching with industry is essential for the enhancement of IoT implementation.	156	3.8718	0.79285
Good industrial engagement provides the students with high job networking opportunities in the future.	**156**	**4.0192**	**0.77436**

The descriptive analysis in Table 7 shows that most respondents agree that good industrial engagement provides students with high job networking opportunities in the future ($\mu = 4.0192$, SD = 0.77436).

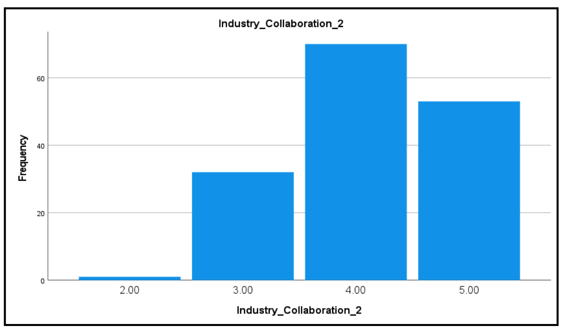

Figure 5. Frequency Chart for Industrial Collaboration Factor

Critical Factors of IoT Implementation
This section seeks to identify the critical factors of IoT implementation in fieldwork courses. Table 8 shows the coefficient analysis of the factors derived from the multiple regression analysis test. The findings reveal that the most critical factor is curriculum alignment (p-value < 0.05; standardised β-value = 0.634), compared to faculty development and training (p-value = 0.308; standardised β-value = -0.105), infrastructure and resources (p-value = 0.181; standardised β-value = 0.136), and industrial collaboration (p-value = 0.205; standardised β-value = 0.097).

Table 8. Coefficients Analysis of the Factors

Coefficients[a]

Model		Unstandardised Coefficients		Standardised Coefficients	t	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
1	(Constant)	0.734	0.243		3.017	0.003			
	Curriculum_Alignment	0.649	0.105	0.634	6.201	0.000	0.709	0.451	0.349

Development_Training	-0.097	0.094	-0.105	-1.023	0.308	0.552	-0.083	-0.058
Infrastructure_Resources	0.140	0.104	0.136	1.343	0.181	0.591	0.109	0.076
Industrial_Collaboration	0.093	0.073	0.097	1.274	0.205	0.510	0.103	0.072

a. Dependent Variable: General_Knowledge

The model summary shown in Table 9 indicates a strong correlation between the variables ($R = 0.722$). The R^2 value of 0.521 indicates that 52.1% of the dependent variable (implementation of IoT) is explained by the independent variables, while 47.9% is explained by non-studied factors.

Table 9. Model Summary

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.722[a]	0.521	0.509	0.46700	2.085

a. Predictors: (Constant), Industry_Collaboration, Training_Development, Infrastructure_Resources, Curriculum Alignment
b. Dependent Variable: General_Knowledge

Referring to Table 10, the results show a strong positive correlation between general knowledge and all factors, with a p-value < 0.01.

Table 10. Correlations Between Factors and General Knowledge

Correlations					
		Curriculum Alignment	Training Development	Infrastructure Resources	Industrial Collaboration
General Knowledge	Pearson Correlation	.709**	.552**	.591**	.510**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000
	N	156	156	156	156

**Correlation is significant at the 0.01 level (2-tailed)

Based on the findings of this study, the most critical factor in IoT implementation in fieldwork courses for undergraduate students at the Faculty of Plantation and Agrotechnology, UiTM is curriculum alignment. Therefore, it is crucial to acknowledge the role of curriculum alignment in enhancing IoT knowledge in fieldwork courses among students. Previous studies suggest that the first step in curriculum alignment is to closely examine the learning objectives of the programme (Martone & Sireci, 2009). These objectives outline the specific knowledge, skills, and competencies that students are meant to acquire (Martone & Sireci, 2009). Hence, IoT integration should reinforce and enrich these objectives. For instance, if a learning objective is to understand data-driven decision-making in plantation management, IoT integration should focus on providing students with practical experiences in collecting and analysing real-time data from IoT devices to inform decision-making processes. IoT integration should be seamless and feel natural within the curriculum context, not as an isolated or forced addition but as an integral part of the learning experience (Thomas, 2016). This involves designing learning activities, assignments, and projects that seamlessly incorporate IoT technologies to align with the course content flow (Wang & Kang, 2006).

Curriculum alignment should also facilitate active learning experiences (Haack, 2008). IoT technologies can provide opportunities for students to engage with real-world data, conduct hands-on experiments, and apply theoretical concepts to practical scenarios. By aligning IoT with active learning strategies, educators can foster deeper understanding and critical thinking among students. Another aspect of curriculum alignment is ensuring that IoT integration addresses current industry trends and demands. Plantation management, like many industries, is evolving with technological advancements. Therefore, the curriculum should equip students with the IoT-related skills sought after by employers (Andrews & Russell, 2012). This alignment can increase students' employability and prepare them for the challenges they will face in their professional careers (Andrews & Russell, 2012). Since curriculum alignment is an ongoing process, regular assessment of the effectiveness of IoT integration should be conducted to determine if the desired outcomes are being achieved (Wiliam & Thompson, 2017). If needed, adjustments can be made to the curriculum to ensure that IoT implementation remains aligned with programme goals and the ever-changing landscape of technology and industry.

On the other hand, factors such as faculty training and development are important to complement the success of curriculum alignment in IoT implementation. Faculty members need to be well-versed in the technical aspects of IoT technologies. This includes understanding how IoT device’s function, how to set them up, how to collect and interpret data from sensors, and how to troubleshoot common technical issues. Familiarity with various types of IoT devices and platforms is crucial for selecting the most appropriate tools for specific learning objectives (Fu, 2013). Understanding the pedagogical strategies that are most effective in conjunction with IoT technologies is vital (Lombardi & Oblinger, 2007). Educators should learn how to design learning activities that capitalise on the unique features of IoT, such as real-time data collection and hands-on experimentation (Haleem et al., 2022). This might involve adopting active learning methods, collaborative projects, or problem-based learning approaches that leverage the capabilities of IoT devices (Haleem et al., 2022). Additionally, faculty development should emphasise the seamless integration of IoT technologies into the curriculum (He et al., 2016). Educators should be trained to incorporate IoT tools in a way that aligns with the course objectives, enhances the learning experience, and complements existing teaching methods (Haleem et al., 2022).

Without the presence of infrastructure and resources, the previous factors may not succeed. It is well-known that for IoT implementation to succeed, it is essential to have reliable network connectivity (Montella et al., 2018), as a stable and high-speed network connection is a foundational requirement for IoT implementation. Uninterrupted network connectivity ensures that data can be collected, transmitted, and analysed in real time, providing valuable insights to students and educators. The availability of appropriate hardware and sensors is crucial for collecting data from the environment (Costa, 2019). Depending on the learning objectives, educators may need access to various sensors such as temperature sensors, humidity sensors, soil moisture sensors (Zamora-Izquierdo et al., 2019), and more, all of which are relevant to plantation management. The hardware should be reliable, accurate, and capable of interacting with the chosen IoT platforms. Additionally, IoT implementation requires specialised software tools and platforms for data collection, visualisation, analysis, and interpretation (Raj et al., 2021).

Finally, industrial collaboration provides insights into current trends and challenges of IoT implementation in academia. Collaborating with industry partners provides educators and students with valuable insights into the latest trends, technologies, and challenges faced in plantation management (Pachayappan et al., 2020). Industry experts can share first-hand knowledge about emerging practices, technological advancements, and evolving market demands, ensuring that the curriculum remains relevant and up-to-date (Pachayappan et al., 2020). Industrial collaboration also allows educators to infuse real-world scenarios into the learning process (Misra et al., 2020). As such, all the factors complement each other, reflecting the strong significant relationship ($p < 0.01$) described in Table 10.

CONCLUSION

This study identifies the factors that influence the implementation of IoT in fieldwork courses for undergraduate students in the Faculty of Plantation and Agrotechnology, UiTM. The findings from this study show that the most critical factor influencing the implementation of IoT in fieldwork courses for the Plantation Management programme at UiTM is curriculum alignment, followed by infrastructure and resources, industrial collaboration, and faculty development and training.

Based on the identified factors, it is suggested that future research should focus on proposing a suitable framework for IoT implementation in fieldwork courses within the university curriculum. This could involve further exploration of the integration of IoT technologies to enhance learning experiences and align curricula with evolving industry demands, thereby preparing students for a technologically driven professional landscape.

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Conflict of Interest

The authors affirm that there is no conflict of interest in this article.

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Authors' Contributions

Authors 1 and 2 conducted the fieldwork, prepared the literature review, and oversaw the write-up of the whole article. Authors 3, 4, and 5 authored the research methodology section and performed the data entry. Authors 6 and 7 conducted the statistical analysis and interpreted the results.

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