

# I-Checkin@PKB: The Acceptance Among Politeknik Kota Bharu Staff

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## Abstract

I-Checkin@PKB has been utilized at Politeknik Kota Bharu (PKB) for nearly six months, replacing the thumbprint attendance monitoring system. With I-Checkin@PKB, users can eliminate the need to wait in line at the centralized terminal for attendance registration, making it more efficient and hygienic. This system helps avoid potential germ transmission through contact with the same terminal, particularly amidst the challenges posed by Covid-19 and viral fever outbreaks. While the management of PKB has received verbal feedback from users, the actual level of user acceptance regarding I-Checkin@PKB remains unknown. Therefore, this study aims to investigate the acceptance level among I-Checkin@PKB users, focusing on perceived ease of use, perceived usefulness, attention to use, and behavioral intention. The study involved 100 respondents selected through random sampling. Utilizing 12 items with a Cronbach Alpha reliability coefficient of  $\alpha=0.97$ , representing the constructs, the results indicated a high level of acceptance among users regarding I-Checkin@PKB, including its ease of use, usefulness, attention, and behavioral intention. Furthermore, the positive perceptions among I-Checkin@PKB users are likely to garner continuous support due to its ability to reduce the risk of human error associated with manual methods, such as paper-based attendance sheets. It is crucial to emphasize that while I-Checkin@PKB systems offer numerous benefits, their successful implementation necessitates clear communication, employee training, and consideration of privacy and security concerns to ensure a positive experience for both employees and the organization.

**Keywords:** I-Checkin@PKB, attendance monitoring system, user acceptance, perceived ease of use, perceived usefulness.

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## INTRODUCTION

Politeknik Kota Bharu (PKB) has implemented the I-Checkin@PKB system to monitor staff attendance and movement. Since June 2023, all PKB staff have been using I-Checkin@PKB, an automated online system designed to manage daily attendance efficiently, saving time and costs, and boosting staff productivity. This technological solution tracks and manages staff presence, absence, and working hours within the organization. Previously, staff had to use fingerprint terminals located at various points in Politeknik Kota Bharu for their daily check-ins and outs. Staff can now check in and out at the office or assigned locations, and real-time attendance can be viewed and monitored in the system. The primary objective of this system is to automate attendance recording, thereby streamlining administrative tasks related to workforce management, which is crucial for every institution (Hassan et al., 2014).

The implementation of various technological advancements in staff attendance monitoring systems, including fingerprint applications, has been observed in PKB. Adamu (2019) found that fingerprint technology is widely used for recording staff attendance, offering several advantages along with its own set of weaknesses and challenges. Concerns such as hygiene, especially amid the Covid-19 pandemic, arise with shared fingerprint scanners (Alagasan

et al., 2021). Employees may be reluctant to use common fingerprint scanners due to concerns about germ transmission (Pavithra et al., 2021).

Fauziah et al. (2021) highlighted common challenges and issues organizations face with attendance monitoring systems, such as technical issues (e.g., system downtimes, network problems, or hardware failures), affecting system reliability. Ensuring the system's user-friendliness and accessibility to all employees, including those with disabilities or limited technological familiarity, presents its own challenges (Munthe et al., 2021). A comprehensive staff attendance monitoring system must meet organizational needs while ensuring data security and privacy.

According to Andre and Suciadi (2022), good perceptions and acceptance among users are crucial for effective system utilization and addressing management issues. Therefore, this paper aims to investigate PKB staff's acceptance of the I-Checkin@PKB system as an attendance monitoring system at Politeknik Kota Bharu, specifically the Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Attitude towards Usage (ATU), and Behavioural Intention (BI).

## **LITERATURE REVIEW**

### **The Acceptance of Staff Attendance Monitoring System**

The acceptance of an attendance monitoring system among users can be influenced by various factors, often contingent on how well the system addresses concerns, adds value, and aligns with user needs (Raj & Mahajan, 2021). According to Rao (2022), a user-friendly interface and straightforward processes contribute to positive user experiences. If the attendance monitoring system is intuitive and requires minimal effort, users are more likely to accept and embrace it (Rao, 2022). Adequate training and education about the system are also crucial. Clear instructions and support provided during the implementation phase can help users understand how the system works and alleviate any concerns they may have (Kumawat et al., 2021; Hasbullah et al., 2022). Moreover, transparent communication about why the attendance monitoring system is being implemented and how it benefits both the organization and employees can foster trust. Jusoh et al. (2021) found that users are more likely to accept the system if they understand its purpose and the positive impact it can have. Clear communication along with robust privacy and security measures are essential (Sudin et al., 2022). Additionally, users need assurance that their personal data, especially biometric information in the case of fingerprint systems, is secure and will not be misused. Furthermore, Preethi et al. (2020) stated that attendance systems that can accommodate various work arrangements, such as remote work or flexible schedules, are likely to be more accepted.

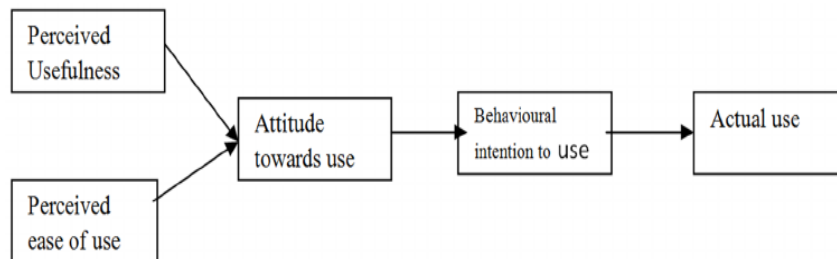
### **Staff Attendance Monitoring System Satisfaction**

Flexibility in system usage can contribute significantly to user satisfaction (Shashikala et al., 2020). Providing options for customization based on individual preferences or specific job roles can enhance user acceptance. Senthilkumar et al. (2020) affirmed that a one-size-fits-all attendance system may not adequately address the diverse needs of different user groups. An established feedback mechanism allows users to express their concerns, suggestions, or issues with the system. This not only aids in continuous improvement but also makes users feel heard and valued. Moreover, incorporating positive reinforcement, such as accurate attendance recognition, can motivate users to willingly engage with the new system. Users are more likely to accept an attendance system that is reliable and provides accurate records (JosephNg & Chow, 2022). Instances of system errors or inaccuracies can lead to frustration and decreased acceptance. The system should seamlessly integrate with users' daily routines and workflows. A study by Al Amin et al. (2021) asserted that if using the attendance system is perceived as an additional and burdensome task among users, their acceptance may be lower. Ensuring that the attendance monitoring system complies with relevant laws and regulations regarding data protection and privacy is crucial for user acceptance (Galgal et al., 2023). Users are more likely to trust a system that adheres to legal standards. Tirupal et al. (2019)

found in their study that by demonstrating the benefits of the system, such as reduced administrative workload and improved accuracy in payroll, organizations can convince users of the value of the system. Organizations should proactively address these factors during the planning, implementation, and communication stages to foster positive user acceptance of attendance monitoring systems.

## METHODOLOGY

This study applied the use of the Technology Acceptance Model (TAM) by Davis (1989) to predict the users' acceptance of the I-Checkin@PKB. There are four main constructs to assess the user's acceptance of the technology used namely the perceived usefulness, perceived ease of use, behavioral intention, and attitudes towards use (Figure 1).



**Figure 1:** The Technology Acceptance Model (TAM)

The data for this study were collected through four constructs: perceived ease of use (comprising four items), perceived usefulness (encompassing four items), behavioral intention (consisting of three items), and attitudes toward use (containing three items). A total of 14 items were distributed to 100 PKB staff via a Google Form. These staff members had been utilizing the I-Checkin@PKB system for nearly six months, selected through simple random sampling. The gathered data were analyzed using Statistical Package for Social Science (SPSS) version 26 to determine the acceptance level of the I-Checkin@PKB among PKB users. The reliability of all items was assessed with a Cronbach's Alpha value of  $\alpha = 0.978$ . According to George and Mallery (2003), a Cronbach's Alpha value above 0.90 indicates excellent internal consistency, above 0.70 is considered good, above 0.60 is questionable, above 0.50 is poor, and below 0.50 is unacceptable. Thus, the items demonstrate reliability for this study. Additionally, mean values were calculated for each construct to determine their positions as low, medium, or high, as per Oxford and Burry-Stock (1995) (see Table 1 below).

**Table 1:** Mean range criterion adapted from Oxford & Burry-Stock (1995)

| Range (Mean Score) | Level  |
|--------------------|--------|
| 3.5 – 5.0          | High   |
| 2.5 – 3.4          | Medium |
| 1.0 – 2.4          | Low    |

## FINDINGS

Based on the analysis, the average age of the I-Checkin@PKB users is between 41 to 50 years of age (47.3%) who have been working for 11 to 20 years in service (50%) and the majority of the users were using the smartphone (97.3%) to gain access to the I-Checkin@PKB.

## The Level of Acceptance for I-Checkin@PKB

### *Perceived Ease of Use*

The analysis revealed that the staff perceived I-Checkin@PKB as highly user-friendly and flexible, with mean ratings indicating ease of use ( $M=4.36$ ,  $SD=0.93$ ) and flexibility ( $M=4.39$ ,  $SD=0.91$ ). Moreover, the interface was reported to be clear and understandable ( $M=4.47$ ,  $SD=0.78$ ), facilitating staff proficiency in utilizing the I-Checkin@PKB system. The overall mean score indicates a significantly high level of perceived ease of use among the staff. Table 2 presents the mean and standard deviation of perceived ease of use for the I-Checkin@PKB system.

**Table 2:** The mean and standard deviation of the perceived ease of use

| Items   | Mean (M)    | Standard Deviation (SD) | Level of Perceived Ease of Use |
|---|-------------|-------------------------|--------------------------------|
| I would find it easy to thumb in and out when I use I-Checkin@PKB         | 4.36        | 0.93                    | High                           |
| I would find I-Checkin@PKB to be flexible and easy to utilize.            | 4.39        | 0.91                    | High                           |
| The interaction with the use of I-Checkin@PKB is clear and understandable | 4.47        | 0.78                    | High                           |
| It would be easy for me to become competent at using I-Checkin@PKB.       | 4.36        | 0.86                    | High                           |
| <b>Cumulative mean</b>  | <b>4.39</b> | <b>0.81</b>             | <b>High</b>                    |

### *Perceived Usefulness*

Meanwhile, regarding the perceived usefulness among PKB staff, respondents affirmed that the I-Checkin@PKB would enhance their job performance ( $M = 4.12$ ,  $SD = 0.99$ ), job productivity ( $M = 4.10$ ,  $SD = 1.00$ ), and is beneficial for their role ( $M = 4.28$ ,  $SD = 0.91$ ). Additionally, they found that utilizing the I-Checkin@PKB would improve their job effectiveness ( $M = 4.10$ ,  $SD = 0.97$ ). The mean and standard deviations of the perceived usefulness of the I-Checkin@PKB system are presented in Table 3.

**Table 3:** The mean and standard deviation of the perceived usefulness

| Items  | Mean (M)    | Standard Deviation (SD) | Level of Perceived Usefulness |
|--|-------------|-------------------------|-------------------------------|
| Using I-Checkin@PKB would improve my job performance.                | 4.12        | 0.99                    | High                          |
| The integration of I-Checkin@PKB would increase my job productivity. | 4.10        | 1.00                    | High                          |
| Using I-Checkin@PKB would enhance my effectiveness on the job.       | 4.10        | 0.97                    | High                          |
| I would find I-Checkin@PKB is useful for my job.                     | 4.28        | 0.91                    | High                          |
| <b>Cumulative mean</b>   | <b>4.15</b> | <b>0.94</b>             | <b>High</b>                   |

### **Attitude Towards Use**

The study revealed that the staff exhibited a notably high level of attitude towards the utilization of I-Checkin@PKB. Through analysis, it was found that the highest cumulative mean stemmed from the attitude towards system usage, with a mean of  $M=4.50$  and a standard deviation of  $SD=0.81$ . This indicates that the staff predominantly hold favorable attitudes towards using I-Checkin@PKB, viewing it as a beneficial tool ( $M=4.55$ ,  $SD=0.76$ ) and expressing total agreement with its positive attributes ( $M=4.50$ ,  $SD=0.81$ ). Furthermore, they perceive I-Checkin@PKB as a viable replacement for the old thumbprint system. Refer to Table 4 for details.

**Table 4:** The mean and standard deviation of the attitude towards use

| Items   | Mean (M)    | Standard Deviation (SD) | Level of Attitude towards Use |
|---|-------------|-------------------------|-------------------------------|
| I believe that it is a good idea to use I-Checkin@PKB.                | 4.55        | 0.76                    | High                          |
| I like the idea of using I-Checkin@PKB to replace thumb print system. | 4.44        | 0.92                    | High                          |
| Using I-Checkin@PKB is a positive idea.                               | 4.50        | 0.81                    | High                          |
| <b>Cumulative mean</b>  | <b>4.50</b> | <b>0.81</b>             | <b>High</b>                   |

### **Behavioral Intention**

Table 5 presents a summary of behavioral intention, indicating a notable level of acceptance. Most respondents exhibit a positive intention to utilize I-Checkin@PKB, with mean scores of 4.45 ( $SD=0.92$ ) indicating their willingness to use it and 4.41 ( $SD=0.93$ ) reflecting their intention to consistently use it. Moreover, respondents express an inclination to continue using I-Checkin@PKB in the future, as indicated by a mean score of 4.40 ( $SD=0.96$ ).

**Table 5:** The mean and standard deviation of the behavioral intention

| Items  | Mean (M)    | Standard Deviation (SD) | Level of Behavioral Intention |
|--|-------------|-------------------------|-------------------------------|
| I plan to consistently use I-Checkin@PKB.          | 4.41        | 0.93                    | High                          |
| In the future, I intend to use I-Checkin@PKB.      | 4.45        | 0.92                    | High                          |
| In the future, I predict I will use I-Checkin@PKB. | 4.40        | 0.96                    | High                          |
| <b>Cumulative mean</b>                             | <b>4.42</b> | <b>0.92</b>             | <b>High</b>                   |

## **DISCUSSION AND CONCLUSION**

The evaluation of the I-Checkin@PKB system reveals a noteworthy positive reception among staff, reflected in key dimensions such as perceived ease of use, usefulness, attention to use, and behavioral intention. The high levels of acceptance signify that staff perceives the system as user-friendly, beneficial, and worthy of attention, indicating a favorable inclination towards incorporating I-Checkin@PKB into their routine practices. This aligns with similar observations made in studies conducted by Jusoh et al. (2021) and Rao (2022), both of which identified elevated levels of acceptance in the implementation of attendance monitoring systems. The consistent findings across these studies underscore the robust nature of positive acceptance trends within organizational contexts, emphasizing the

growing importance and effectiveness of such technological solutions. Overall, the high acceptance levels elucidate the successful integration of I-Checkin@PKB into the work environment, marking it as a well-received and valuable tool for enhancing attendance monitoring and related processes among staff.

The pervasive acceptance of the I-Checkin@PKB system among staff can be attributed to its perceived user-friendly interface, implying that the system is easily navigable and comprehensible for users. This finding is consistent with Kumawat's (2021) observation where the advancement of the technology used directly influences the ease with which individuals can interact with and integrate a technological tool into their daily routines. The positive perception of ease of use reflects not only on the design and functionality of the system but also on the effectiveness of any training or onboarding processes implemented to familiarize staff with the new system.

Furthermore, the staff's recognition of the perceived usefulness of the I-Checkin@PKB system highlights its tangible benefits in facilitating attendance monitoring and related processes. The positive correlation between perceived usefulness and acceptance indicates that staff acknowledges the practical advantages and values the system brings to their workflow. This aligns with the broader trend observed in organizational settings, where the integration of technology is often met with enthusiasm when it is perceived as an asset that enhances efficiency and effectiveness in day-to-day operations (Shahrizal et al., 2022; Roslin et al., 2022; Mohamad Kasim et al., 2023).

The attention to use and behavioral intention dimensions also contribute to the overall positive evaluation of the I-Checkin@PKB system. Staff's attentiveness towards utilizing the system signifies active engagement and commitment to its incorporation into their routine activities. This indicates that the system has successfully captured the interest and commitment of staff, emphasizing its relevance and importance in their professional endeavors. The positive behavioral intention further solidifies the likelihood of continued usage and adherence to the system, establishing it as a sustainable and enduring solution for attendance monitoring needs (Andre & Suciadi, 2022).

It is important to note that while I-Checkin@PKB systems offer many benefits, their successful implementation requires clear communication, employee training, and consideration of privacy and security concerns to ensure a positive experience for both employees and the organization (Adamu, 2019). Additionally, the positive and high perceptions among users of I-Checkin@PKB systems will consistently garner support since it could reduce the risk of human error associated with manual methods, such as paper-based attendance sheets. Employees can often check in from various locations, especially if the system is accessible through the Internet (Fauziah et al., 2021). This can be particularly beneficial for organizations with remote or flexible work arrangements and schedules. Plus, I-Checkin@PKB saves time compared to traditional methods. A manual check-in process is time-consuming, tedious, and costly. The I-Checkin@PKB system enables users to check in and out, and administrators can monitor and generate attendance reports with minimal effort. The operational and maintenance costs for the terminals can also be reduced.

In conclusion, the I-Checkin@PKB system has successfully garnered significant acceptance among staff, as evidenced by positive responses in key dimensions such as perceived ease of use, usefulness, attention to use, and behavioral intention. The system's user-friendly design, coupled with its perceived usefulness, has contributed to its seamless integration into the work environment. The alignment of these findings with similar observations in contemporary studies reinforces the notion that attendance monitoring systems are becoming increasingly integral to organizational processes, and the I-Checkin@PKB system stands out as a well-received and valuable tool in this evolving technological landscape.

## REFERENCES

- Adamu, A. (2019). Attendance management system using fingerprint and iris biometric. *Federal University Dutsin-Ma Journal of Sciences*, 3(4), 427–433. <https://fjs.fudutsinma.edu.ng/index.php/fjs/article/view/1667>

- Al Amin, S., Islam, M. A., & Islam, M. S. (2021). A fingerprint based smart attendance and security system using Internet of Things (IoT) and ultrasonic sensor. *International Conference on Automation, Control and Mechatronics for Industry 4.0*, 1–5. <https://doi.org/10.1109/ACMI53878.2021.9528092>
- Alagasan, K., Alkawaz, M. H., Hajamydeen, A. I., & Mohammed, M. N. (2021). A review paper on advanced attendance and monitoring systems. *12th Control and System Graduate Research Colloquium*, 195–200. <https://doi.org/10.1109/ICSGRC53186.2021.9515249>
- Andre, A., & Suciadi, M. F. (2022). The online attendance system models for educational institutions. *American Institute of Physics Conference Proceedings*. AIP Publishing. <https://doi.org/10.1063/5.0050146>
- Baldwin, M. (2020). *Attendance and punctuality policy 2020-2021*. EBN Academy. <http://ebnacademy2.co.uk/wp-content/uploads/2021/09/Attendance-Policy-Oct-2020.pdf>
- Davis, F. D. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science Journal*, 35(8), 982–1003. <https://doi.org/10.1287/mnsc.35.8.982>
- Fauziah, Z., Latifah, H., Rahardja, U., Lutfiani, N., & Mardiansyah, A. (2021). Designing student attendance information systems web based. *Aptisi Transactions on Technopreneurship Journal*, 3(1), 23–31. <https://doi.org/10.34306/att.v3i1.114>
- Galgale, S. S., Yamakanamardi, J. S., Koli, S. R., & Desai, M. J. (2023). The location-based attendance system. *International Research Journal of Modernization in Engineering Technology and Science*, 5(4). [https://www.irjmets.com/uploadedfiles/paper/issue\\_4\\_april\\_2023/35384/final/fin\\_irjmets1681110508.pdf](https://www.irjmets.com/uploadedfiles/paper/issue_4_april_2023/35384/final/fin_irjmets1681110508.pdf)
- George, D., & Mallery, M. (2010). *SPSS for Windows step by step: A simple guide and reference* (10th ed.). Pearson.
- Hassan, H., Rahmatullah, B., & Mohamad Nordin, N. (2014). Towards School Management System (SMS) success in teacher's perception. *Malaysian Online Journal of Educational Technology*, 2(4), 50–60.
- Hasbullah, N. H., Rahmatullah, B., Rasli, R. M., Khairudin, M., & Downing, K. (2022). Google Meet usage for continuity and sustainability of online education during pandemic. *Journal of ICT in Education*, 9(2), 46-60.
- JosephNg, P. S., & Chow, S. R. (2022). Jom attendance: Making facial business sense. *Journal of Telecommunication, Electronic and Computer Engineering*, 14(1), 1–5. <https://jtec.utem.edu.my/jtec/article/view/6139>
- Jusoh, J. A., Rose, A. N. M., Aledinat, L. S., Altrad, A., Saany, S. I. A., Aseh, K., & El-Ebiary, Y. A. B. (2021). Track student attendance at a time of the Covid-19 pandemic using location-finding technology. *2nd International Conference on Smart Computing and Electronic Enterprise*, 147–152.
- Kumawat, D., Shrimali, G., Malviya, K., Kataria, M., Intodia, P., & Teli, B. (2021). Attendance management system using fingerprint and voice recognition with geofence. *International Journal of Advanced Research in Computer Science*, 12, 40.
- Mohamad Kasim, F. S., Rahmatullah, B., Rahmatullah Khan, H. K., Rosli, A. N., Che Lah, N. H., Hidayanto, A. N., & Matthíasdóttir, Á. (2023). The effectiveness of online supervision for postgraduate students: A systematic literature review. *ASEAN Journal of Teaching & Learning in Higher Education*, 15(2).
- Mousavi, S. M., Karimi, A., Zakerian, S. A., & Jahadi Naeini, M. (2020). Factors affecting performance of permit to work system: A case study in an oil refinery. *Archives of Occupational Health*, 4(4), 863–869. <https://doi.org/10.18502/aoh.v4i4.45122>
- Munthe, B., Arifin, A., Nugroho, B. S., & Fitriani, E. (2021). Online student attendance system using Android. *Journal of Physics: Conference Series*, 1933(1). <https://doi.org/10.1088/1742-6596/1933/1/012048>
- Oxford, R. L., & Burry-Stock, J. A. (1995). Assessing the language learning strategies worldwide with the ESL/EFL version of the strategy inventory language learning. *System*, 23, 1-23. [https://doi.org/10.1016/0346-251X\(94\)00047-A](https://doi.org/10.1016/0346-251X(94)00047-A)
- Pavithra, M. P., Sarika, A. S., & Rajendran, A. (2021). Attendance management system using RFID technology. *Advance Sustainable Science, Engineering and Technology (ASSET) Journal*, 4(1), 0220104-1-0220104-9. <https://doi.org/10.26877/asset.v4i1.11678>
- Preethi K., Chiluka S., Bhavya V., Kumar K.P., Krishna P.V. (2020). Face recognition based attendance tracking system for education sectors. *Junikhyat Journal*. <https://doi.org/10.17577/IJERTV9IS05086>
- Raj, M., & Mahajan, T. (2021). Study of opinions related to the use of bio-enabled attendance system for improving punctuality among teachers. *MIER Journal of Educational Studies Trends and Practices*, 11(1), 41–52. [https://doi.org/10.52634/mier/2021/v11/i1\(a\)SPL/1911](https://doi.org/10.52634/mier/2021/v11/i1(a)SPL/1911)
- Rao, A. (2022). AttenFace: A real time attendance system using face recognition. *6th Conference on Information and Communication Technology (CICT)*, 1–5. <https://doi.org/10.1109/CICT56698.2022.9998001>
- Roslin, A. R., Rahmatullah, B., Zain, N. Z. M., Purnama, S., & Yas, Q. M. (2022). Online learning for vocational education: Uncovering emerging themes on perceptions and experiences. *Journal of Vocational Education Studies*, 5(1), 1-15.
- Senthilkumar, S., Bhuvanawari, S., & Clapton, E. (2020). Smart monitoring system using RFID technology. *6th International Conference on Advanced Computing and Communication Systems*, 1430–1433. <https://doi.org/10.1109/ICACCS48705.2020.9074448>
- Shahrizal, A. Z. S. A., Rahmatullah, B., Ab Majid, M. H., Samuri, S. M., Hidayanto, A. N., Yas, Q. M., & Malim, T. (2022). A systematic literature review on the use of podcasts in education among university students. *ASEAN Journal of Teaching and Learning in Higher Education*, 14(1), 222-236.
- Shashikala, H. K., Shakya, S. N., Panjiyar, P., Upreti, A. S., & Dadapeer, S. (2022). Attendance monitoring system using face recognition. *International Journal of Information Technology, Research and Applications*, 1(3), 15–22. <https://doi.org/10.5281/zenodo.7385439>
- Sudin, I. A. A., Rahmatullah, B., Abdullah, M. F. W., Tamrin, K. F., Khairudin, M., & Yahya, S. R. (2022). A systematic literature review study on university students' exposure to 3d printing as preparation for industry. *Journal of ICT in Education*, 9(1), 48-60
- Tirupal, T., Praneeth, E. S., Srihari, P., Kiran, K. S., & Pasha, M. K. (2019). Efficient attendance management using multiple face recognition. *Elixir Computer Engineering Journal*, 137, 53899–53904.