Appissode

Design and Development of an Electronic Module for Training in Manual Screening of Individuals or Using Handheld Metal Detector Basic Aviation Security Course

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Abstract

The Aviation Polytechnic of Surabaya is a vocational institution offering courses in aviation, including Aviation Security (AVSEC). However, the Air Transportation Management Program faces a shortage of learning resources. This paper aims to analyze student needs, develop learning resources, assess their feasibility, and gather feedback on an electronic module for the AVSEC course. The module, created using Canva, will be distributed via the institution's Learning Management System (LMS) and the author's YouTube channel to enhance learning and improve students' competencies. The Research and Development (RnD) method with a 4D development model (Define, Design, Development, and Disseminate) was used to create the module. In the Define stage, the lack of learning media for AVSEC was identified. During the Design stage, the electronic module was developed based on the syllabus. In the Development stage, the module and validation form were distributed to selected respondents, with feedback from students and lecturers incorporated into the final version. In the Disseminate stage, the module was made available through the LMS. Based on data analysis, the module received a 73% validity rating from students, indicating its potential to enhance the existing learning resources for the AVSEC course..

1 INTRODUCTION

Education is a means to enhance human intelligence and abilities. Through education, individuals can develop their personalities and critical thinking skills. Technological advancements in education are among the methods used to improve educational quality. The continuous evolution of information and communication technology (ICT) fosters the development of educational technology. Learning systems are significantly influenced by advancements in information, communication, and technology. What was once the sole responsibility of instructors is now primarily the responsibility of students, as learning can occur anytime and anywhere, whether through face-to-face or virtual activities. Therefore, education as a field must continuously adapt to changing conditions and support student learning in various situations.

Safety in aviation is of paramount importance and must be strictly adhered to. Aviation security professionals, who are responsible for various security aspects at airports and during flight operations, play a crucial role in ensuring flight safety. The issuance of licenses in accordance with the requirements specified in Law No. 1 of 2009 on Aviation, Article 91, which states that "Every aviation personnel, whether working on aircraft or on the ground related to flight safety, must have a license or other approval issued by the Director General," is one of the primary efforts to ensure the competency and professionalism of aviation security personnel.

The official document that certifies an individual's completion of training, work experience, and examinations approved by aviation authorities is an aviation security personnel license. Holding this license demonstrates an individual's technical proficiency as well as their compliance with stringent safety regulations in the aviation sector. This aligns with the explanation provided in Idonesian Law No. 1 of 2009 on Aviation, which states that a license is a permit granted to an individual who meets specific standards to engage in their field of activity for a designated period. However, despite the general recognition of the necessity for aviation security personnel licenses, there are still certain challenges and discussions surrounding its implementation.

Safety is a top priority and must be upheld, given the increasing complexity and dynamism of the aviation industry. The presence of qualified and experienced aviation security personnel is crucial to maintaining flight safety. However, effective and efficient training and certification procedures are required to ensure that aviation security personnel possess the necessary skills. Information and communication technology has transformed education and social interactions in today's digital era. Training processes can now be conducted more effectively, efficiently, and with better accessibility due to digitalization. Digital technology can be leveraged to enhance the training process for aviation security officers, resulting in a more competent and prepared workforce

The importance of licensing for aviation security personnel and how digitalization can enhance the training process will be the main focus of this final project. The project aims to find creative and practical solutions to support the development of qualified and competent aviation security personnel in today's fast-paced aviation industry by understanding the crucial role of licensing in maintaining flight safety and the potential of digitalization to improve training efficiency. The chosen title for this project is: **"Design and Development of an Electronic Module for Training in Manual Screening of Individuals or Using Handheld Metal Detector / HHMD Basic Aviation Security Course Based on Moodle Using Research and Development 4D."**

In this final project to conclude the author's education in Aviation Polytechnic of Surabaya, the author identifies several issues related to the need for learning media at Aviation Polytechnic of Surabaya, particularly within the context of the BASIC AVIATION SECURITY course. The primary questions addressed include identifying the need for learning media, developing an electronic module based on Moodle using the Research and Development 4D Model, and testing the feasibility of the module.

To avoid topic expansion, the author limits the scope by focusing on the development of an electronic module using Canva, which will be integrated into the Learning Management System (LMS) of Aviation Polytechnic of Surabaya. This module will cover material and competencies related to personal screening in Basic Aviation Security, incorporating both theory and practical elements in line with real-world conditions at airports.

The main objective of this final project is to develop teaching materials for use in the Aviation Security course training at Aviation Polytechnic of Surabaya. With a viable and innovative module, it is expected to enhance the ease of teaching and positively contribute to the quality of education at the institution. The anticipated benefits of this project include improving the author's technological skills as preparation for entering the workforce in the era of Industry 4.0, and contributing to Aviation Polytechnic of Surabaya by facilitating a more flexible and efficient teaching and learning process for students in the Air Transportation Management program.

2 METHODS

Research Design
This study employs the Research and Development (R&D) method, aimed at developing or refining a product, in this case, the electronic module for Aviation Security (AVSEC). The R&D method includes processes from understanding, basis, to findings related to the electronic module. After the module is developed based on the findings, its effectiveness is tested, followed by improvements before it is finally disseminated to the public.

Additionally, this study adopts the 4D model, which consists of four stages: define (needs analysis), design (framework and educational materials preparation), develop (development and validation testing of the media), and disseminate (implementation to the writing subject). The development of the AVSEC electronic module aims to optimize the training process through the digitalization of learning materials, making it easier for learners to study the presented content.

Data Collection Techniques
The development of the electronic module for Aviation Security is a quantitative task that utilizes surveys or questionnaires to collect data. One characteristic of quantitative research is that the researcher acts as both the data collector and the instrument, guiding interviews, observations, questionnaires, and other methods. Sugiyono defines a questionnaire as a data collection method that involves providing a series of written questions or statements to respondents to be completed. Surveys, also known

as questionnaires, are written tools used by researchers to obtain data from respondents in the form of statements or questions to investigate data and perspectives.

For this project, the researcher will use faculty members from the Polytechnic of Surabaya and students from the Air Transportation Management Program as subjects. The goal of data collection is to identify product shortcomings and gather feedback and suggestions that can serve as a guide for improving the quality of the electronic module being developed.

LITERATURE REVIEW
Supporting Theories
Design and Construction, according to Pressman, refers to a series of procedures that translate system analysis results into programming language, describe the details of components, and address limitations in the development process. Construction involves creating, replacing, or improving an existing system. Overall, design and construction pertain to the depiction, planning, and creation of sketches that integrate separate elements into a cohesive, functional whole.

An electronic module, or e-module, is a digital learning medium that contains text, images, animations, or videos to support the learning process. Unlike conventional modules, e-modules are more engaging and interactive, leveraging digital formats to provide a more dynamic learning experience that is easily accessible via computers or other electronic devices.

Moodle is a web-based learning platform that serves as a "Digital Classroom". Moodle allows access to learning materials, quizzes, and electronic journals, and supports remote learning. It offers several advantages, such as being open-source, which allows for free access, and its flexibility, making it user-friendly for various educational stakeholders.
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Aviation Security (AVSEC)
Aviation Security is responsible for overseeing the operational safety of aviation and airport facilities. This encompasses not only security and safety but also the protection of people, cargo, aircraft, buildings, and critical ground and airborne assets, particularly those around and within airports. According to Indonesian Law No. 1 of 2009 of Aviation, Aviation Security is tasked with ensuring the safety and security of aircraft, especially at airports, and holds responsibilities in accordance with its authority.

Personnel Licensing
According to Transportation & Air, a license is a permit granted to an individual who has met specific requirements to perform work in their field for a designated period. The same source defines airport personnel as those directly involved in the operation and/or maintenance of airport infrastructure. Based on this definition of licenses and airport personnel, an aviation security license is an authorization given to individuals who meet the requirements to operate and maintain airport facilities for a specified duration.

Additionally, Regulation PM 32 of 2020 governs the competency absorption process, specifically training for aviation security personnel, and the urgency of demonstrating competency through licensing. This regulation aims to ensure that aviation personnel education and training activities are conducted periodically, professionally, and in accordance with standards set by Indonesian civil aviation authorities. The goal is to enhance the safety and security of aviation operations in Indonesia by improving the quality and skills of aviation workers.

Basic Aviation Security (AVSEC)
Personnel who have completed basic aviation security (AVSEC) training are known as basic aviation security personnel. To ensure the safety of aviation operations, they are responsible for performing fundamental security duties at airports and other aviation infrastructure. These responsibilities include processing suspicious items, managing access to restricted areas, inspecting individuals and baggage for potential threats to aviation safety, and more.

Key topics covered in Basic Aviation Security (AVSEC) training include Understanding aviation security processes, identifying risks and threats, Screening and searching techniques, Communication and dispute resolution techniques, Relevant aviation security laws and policies.

Basic aviation security personnel are also trained in the use of contemporary security tools and technologies, such as closed-circuit television (CCTV), surveillance systems, baggage scanners, and metal detectors. To ensure that aviation security protocols are adhered to and aviation operations remain safe, Basic Aviation Security (AVSEC) personnel must be present at airports and other aviation locations. This requirement is reinforced by PM 28 of 2021, which outlines the criteria for the National Aviation Security Education and Training Program set by the Ministry of Transportation.

Data Analysis techniques
In this research, data analysis techniques involve processing data collected from respondents using inferential statistics, which allows the results of the sample analysis to be generalized to a larger population. The questionnaires used in this study assess the quality of the learning media and participants' responses. These questionnaires employ a Likert scale with a 1-4 interval to measure respondents' opinions, attitudes, and perceptions, where supportive answers receive higher scores and non-supportive answers receive lower scores.

Validity Testing is used to determine the extent to which the measurement tool in this research accurately measures what it is supposed to measure. The validity of the questionnaire is tested using correlation coefficients, where a value of 0.5 is considered valid for use. Validity testing is conducted with Microsoft Excel, utilizing the correlation formula to calculate the validity coefficient. If the results indicate high validity, the questionnaire is deemed suitable for use in the research.

In addition to validity, reliability testing is also conducted to ensure the consistency of respondents' answers over time. In this research, reliability testing is performed using the Cronbach's Alpha method, with the aid of Microsoft Excel. An instrument is considered reliable if its reliability coefficient is close to 1 or deemed adequate if it is greater than or equal to 0.7. High reliability test results indicate that the instrument can be trusted to collect accurate data in the field.

3   RESULTS

This research employs the Research and Development (RnD) method to develop or refine a product, specifically an e-module as a learning tool for the Aviation Security course. The development process follows the 4D model, which consists of four stages: define, design, develop, and disseminate. These stages are designed to identify user needs, develop appropriate learning designs, and test and disseminate the resulting product.

In the define stage, the author conducted a needs analysis to understand the deficiencies within the Air Transportation Management Study Program, particularly the lack of e-modules as a learning support tool. This analysis provided the foundation for the next stage, design, where the author designed the e-module using Canva, chosen based on the characteristics of the material and the learners. The module was developed in accordance with the course syllabus and included animations and evaluation components such as Mid-Semester Exams and Final Exams. This design aimed to enhance the learning experience by integrating interactive and engaging elements, tailored to the specific needs of the course and its students.

In the **develop** stage, the product underwent testing and validation by subject matter experts and students. This trial phase aimed to gather feedback, which was then used to refine the module before it was widely implemented. The educational product was tested to ensure that the content and design were effective and met the learning needs. The final stage, **disseminate**, involved distributing the e-module to students via online platforms such as Google Drive and Canva. The module was made available as open educational material, which not only supported Aviation Security trainees but also helped to enhance public knowledge about aviation security regulations and airport screening procedures.

The validation process for the e-module was carried out by subject matter experts, specifically the instructors of the Aviation Security (AVSEC) course, as well as students from the 7th Alpha cohort of the Air Transportation Management Program. This validation was conducted using Google Forms, aimed at evaluating the alignment of the content presented in the e-module with the established basic competencies (KD) and core competencies (KI). A total of 51 respondents participated in the validation process, which represents 25% of the total population of 209 students. This sample size was chosen to ensure that the feedback collected was representative and provided a comprehensive evaluation of the e-module's effectiveness and relevance.

The validation questionnaire provided to subject matter experts was based on validation sheets from the Directorate of Educational Personnel and the Directorate General of Educator and Educational Personnel Quality Improvement. The focus was on evaluating how the e-module was developed, whether the content was aligned with the existing curriculum, and the practicality of using the e-module as a standalone teaching resource without relying on other materials.

Meanwhile, the validation questionnaire for students was designed based on the teaching material validation sheets provided by the National Professional Certification Agency (BNSP). This questionnaire aimed to measure students' interest in the e-module and assess the appropriateness of the content and language used. Feedback from students was crucial to ensure that the e-module not only met academic standards but also was engaging and easily understood by the target users.

Data analysis was conducted after collecting data from subject matter experts and students via Google Forms. The obtained data was then analyzed to generate information that supports the development of the Aviation Security e-module. This process included testing the writing instrument, validity testing, reliability testing of the questionnaire, and analyzing the evaluation results

The writing instrument testing was conducted by assessing the validity of the instrument through the correlation of each indicator's score with the variable's score using the Pearson Product Moment method. This testing was performed on the questionnaire distributed to 51 students of the Diploma 3 Air Transportation Management Program. The results indicated that all statements in the questionnaire were valid, with the calculated r value being greater than the table value (0.279). Subsequently, reliability testing was carried out using the Cronbach Alpha method, yielding a value of 0.981, which indicates that the questionnaire is reliable.

The **content validity test** revealed that the aspects of interest, content, and language in the e-module received approval percentages of 72%, 73%, and 74%, respectively, from 65 respondents. Additionally, the evaluations from subject matter experts showed highly positive results, with an average score of 100% on all assessment aspects, indicating that the module is highly suitable as an educational media.
The writing process began with analyzing the issues and subjects within the Diploma 3 Air Transportation Management Program, followed by observation and title determination. After the proposal was approved, the author developed the educational media using the R&D 4D model and conducted validation through a questionnaire. The final results indicate that the e-module is suitable for use and ready for testing in the final project defense.

DISCUSSION

The development process of the e-module for the Aviation Security course, conducted using the Research and Development (RnD) method, is an effort to improve the quality of learning in the Air Transportation Management Program. By employing the 4D model, which consists of define, design, develop, and disseminate, the author can systematically identify needs, design, test, and disseminate a module that meets educational requirements. The first step, define, involves a needs analysis that is crucial for ensuring that the developed module addresses the gaps present in the study program.

In the design phase, the use of Canva shows that the author considered the characteristics of the material and the learners in the development of this e-module. Canva's use not only facilitates the creation of an engaging and interactive module but also allows for the integration of evaluation components such as Mid-Term and Final Exams. This is important to ensure that the module is not only informative but also supports the assessment process in learning.

The develop phase, which involves testing and validation by subject matter experts and students, is key to ensuring the module's quality. This validation process provides an opportunity to receive direct feedback from experts and end users, allowing the module to be refined before dissemination. The validation, conducted using Google Forms-based questionnaires, shows a data-driven approach in decision-making, with results indicating high levels of validity and reliability.

Finally, the disseminate phase ensures that the developed module is widely accessible to students through online platforms. The dissemination of this module as an open educational resource not only enhances accessibility but also has the potential to increase public understanding of key aspects of aviation security. Thus, this e-module serves not only as a learning tool for students but also as a contribution to enhancing knowledge in the field of aviation security.

CONCLUSION

Based on the results of the final project focusing on the development of the Electronic Module for the Basic Aviation Security (AVSEC) course, several key conclusions can be drawn from the preparation process through to data analysis.

First, the understanding of the importance of accelerating the adaptation of Information and Communication Technology (ICT) in education has driven the development of effective and efficient teaching materials. By identifying this need, the Electronic Module accessible through the Learning Management System (LMS) of Aviation Polytechnic of Surabaya has become a relevant and necessary solution to support a more modern and integrated learning process.

Second, the development of this module used the Research and Development (RnD) method with the 4D research model, which includes define, design, develop, and disseminate. The resulting module not only integrates theory and practice but also reflects real-world conditions that can be accessed anytime by training participants through the LMS. The feasibility testing conducted showed very positive results, with 73% of student respondents and AVSEC personnel evaluating the module as suitable for use, while expert/mentor assessments indicated a 100% score in terms of content and substance feasibility. These results affirm that the developed electronic module meets the standards as an effective and high-quality teaching material.

REFERENCES

[1] Alhamid, T., & Budur, A. (2019). Resume: Instrumen Pengumpulan Data. Sekolah Tinggi Islam Negeri (STAIN), 2.

[2] Aljasser, A., Elmaraghy, C. A., & Jatana, K. R. (2018). Utilization of a handheld metal DETECTOR protocol to reduce radiation exposure in pediatric patients with esophageal coins. International Journal of Pediatric Otorhinolaryngology, 104- 108. https://doi.org/10.1016/j.ijporl.2018.06.041.

[3] Arikunto, S. (2014). Prosedur Penulisan untuk Pendidikan Suatu. Jakarta: Rineka Cipta.

[4] Arsyad, A. (2011). Media Pembelajaran. Jakarta: PT. Raja Grafindo Persada.

[5] Audina, W. S. (2022, July 7). Contoh Teknik Analisis Data Kuantitatif, Pemula Wajib Tahu. Retrieved from DQLab: https://dqlab.id/contoh-teknik-analisis-data-kuantitatif-pemula-wajib-tahu#:~:text=Teknik%20analisis%20data%20pada%20penulisan,dan%20melakuk an%20perhitungan%20uji%20hipotesis.

[6] Biel, M. (2024). Research and development activity as an element of enterprises innovation. Procedia Computer Science, 785 - 794. https://doi.org/10.1016/j.procs.2023.10.065.

[7] Caliskan, S., & Bicen, H. (2016). Determining the Perceptions of Teacher Candidates on the Effectiveness of MOODLE Used in Flipped Education. Procedia Computer Science, 654 - 658. http://dx.doi.org/10.1016/j.procs.2016.09.457.

[8] Chen, C. -J., Tsai, H. -J., Lee, M. Y., & dkk. (2023). Effects of a Moodle-based E-learning environment on E-collaborative learning, perceived satisfaction, and study achievement among nursing students: A cross-sectional study. Nurse Education Today, -. https://doi.org/10.21203/rs.3.rs-1402422/v1.

[9] Gillen, D., & Morrison, W. G. (2015). Aviation security: Costing, pricing, finance and performance. Journal of Air Transport Management, 1 - 12. https://doi.org/10.1016/j.jairtraman.2014.12.005.

[10] Gordon, G. A., & Young, R. R. (2024). Securing Integrated Transportation Networks. -: Elsevier.

[11] Heng, K., & Sol, K. (2024). Understanding stakeholders' perspectives on recent initiatives to promote research and development in higher education in Cambodia. International Journal of Educational Research, -. https://doi.org/10.1016/j.ijer.2024.102378.

[12] Indonesia. (2009). Undang-Undang No 1 tahun 2009 tentang Penerbangan. Jakarta: Pemerintah Republik Indonesia.

[13] KementrianPerhubungan.(2021).PM28Tahun2021.Jakarta:KementerianPerhubungan.

[14] Kepoh,S.2.(2020).ModulAjar"KEPOH"MateriPerubahanWujudBenda.ModulAjar"KEPOH"MateriPerubahanWujud Benda, 70 - 86.

[15] Kolekar, S. V., Pai, R. M., & dkk. (2018). Adaptive User Interface for Moodle based E-learning System using Learning Styles. Procedia Computer Science, 606- 615. http://dx.doi.org/10.1016/j.procs.2018.08.226.

[16] Komang Kartina Sari Dewi, P. D. (n.d.). Pengembangan Konten Biologi Materi Ekosistem Hutan Wisata Alas Kedaton Sebagai Suplemen Bahan Ajar Untuk Siswa Kelas.

[17] Laili, I., Ganefri, & Usmeldi. (2019). Efektivitas Pengembangan E-Modul Project Base Learning Pada Mata Pelajaran Instalasi Motor Listrik. Jurnal Ilmiah Pendidikan dan Pembelajaran, 308. https://doi.org/10.23887/jipp.v3i3.21840.

[18] Lee,A.J.,&Jacobson,S.H.(2011).Theimpactofaviationcheckpointqueuesonoptimizingsecurityscreeningeffectiveness. Reliability Engineering & System Safety, 900 - 911. https://doi.org/10.1016/j.ress.2011.03.011.

[19]   Liu,J.,Zheng,Y.,Zhang,C.,&dkk.(2024).ImagingsimulationforintegratedhandheldX-raytransmissionandbackscatter imaging system with a disk scanner. Radiation Physics and Chemistry, -. http://dx.doi.org/10.1016/j.radphyschem.2024.111843.

[20] Madavha, L., Laseinde, T., Daniyan, I., & Mpofu, K. (2020). Functional design and performance evaluation of a metal handheld DETECTOR for land mines detection. Procedia CIRP, 696-703. https://doi.org/10.1016/j.procir.2020.04.134.

[21] Mason, J., Saccheti, A., Herbert, M., & Jhun, P. (2017). Just How Good Are Handheld Metal DETECTORs for Ingested Foreign Bodies? Annals of Emergency Medicine, 516-518. http://dx.doi.org/10.1016/j.annemergmed.2017.02.001.

[22] Natasia, C., Puspasari, & Durinta. (2020). Pemanfaatan Media E-LEarning Moodle Untuk Menunjang Pembelajaran Mahasiswa di Fakultas Manajemen dan Bisnis Universitas Ciputra. Jurnal Pendidikan Administrasi Perkantoran (JPAP), 171. https://doi.org/10.26740/jpap.v8n1.p169-179.

[23]   Nation,J.,&Jiang,W.(2017).TheutilityofahandheldmetalDETECTORindetectionandlocalizationofpediatricmetallic foreign body ingestion. International Journal of Pediatric Otorhinolaryngology, 1-6. https://doi.org/10.1016/j.ijporl.2016.10.035.

[24]   Nation,J.,&Jiang,W.(2017).TheutilityofahandheldmetalDETECTORindetectionandlocalizationofpediatricmetallic foreign body ingestion. International Journal of Pediatric Otorhinolaryngology, 1-6. https://doi.org/10.1016/j.ijporl.2016.10.035.

[25]   OctarismaHandayaniHutagalung,M.A.(2020).StudentResponsetoEdmodoLearningMediaatSMANegeri2Tenggarong. Samarinda: Program Studi Sarjana Pendidikan Kimia, Fakultas Keguruan dan Ilmu Pendidikan, Universitas Mulawarman.

[26] Okpatrioka. (2023). Research and Development (R&D) Penulisan Yang Inovatif Dalam Pendidikan. Jurnal Pendidikan, Bahasa dan Budaya, 87. https://doi.org/10.47861/jdan.v1i1.154.

[27] Oproiu, G. C. (2015). A Study about Using E-learning Platform (Moodle) in University Teaching Process. Procedia - Social and Behavioral Sciences, 426 - 432. https://doi.org/10.1016/j.sbspro.2015.02.140.

[28]   Paragina,F.,Paragina,S.,Jipa,A.,&dkk.(2011).ThebenefitsofusingMOODLEinteachertraininginRomania.Procedia - Social and Behavioral Sciences, 1135 - 1139. http://dx.doi.org/10.1016/j.sbspro.2011.03.252.

[29] Perhubungan, K., & Udara, D. J. (2017). KP 41 Tahun 2017. Jakarta.

[30] Pressman, R. S. (2015). Rekayasa Perangkat Lunak.Pendekatan Praktisi. Yogyakarta: Andi.

[31] Price, J. C., & Forrest, J. S. (2013). Practical Aviation Security (Second Edition). -: Butterworth-Heinemann.

[32] Price, J. C., & Forrest, J. S. (2013). Practical Aviation Security (Second Edition) : 9 - General Aviation Security. - : Butterworth-Heinemann,.

[33] Rodriguez, T. E., & Lozano, P. M. (2012). The acceptance of Moodle technology by business administration students. Computers & Education, 1085 - 1315. http://dx.doi.org/10.1016/j.compedu.2011.11.012.

[34]   Rymanova,I.,Baryshnikov,N.,&Grisheva,A.(2015).E-courseBasedontheLMSMoodleforEnglishLanguageTeaching: Development and Implementation of Results. Procedia - Social and Behavioral Sciences, 236 - 240. http://dx.doi.org/10.1016/j.sbspro.2015.10.016.

[35]   Sanaky,M.M.,Saleh,L.M.,Titaley,&D.,H.(2021).ANALISISFAKTOR-FAKTORPENYEBABKETERLAMBATAN PADA PROYEK PEMBANGUNAN GEDUNG ASRAMA MAN 1 TULEHU MALUKU TENGAH. Jurnal Simetrik Vol II, No 1, 433. https://doi.org/10.31959/js.v11i1.615.

[36]   Sarpong,D.,Boakye,D.,Ofosu,G.,&Botchie,D.(2023).Thethreepointersofresearchanddevelopment(R&D)forgrowth-boosting sustainable innovation system. Technovation, -. https://doi.org/10.1016/j.technovation.2022.102581.

[37] Stewart, M. G., & Mueller, J. (2018). Are We Safe Enough? -: Elsevier.

[38] Sugiyono.(2014).MetodePenulisanKuantitatifKualitatifdanR&D.Bandung:AlfaBeta.

[39] Sugiyono.(2019).MetodelogiPenulisanKuantitatifdanKualitatifDanR&D.Bandung:Alfabeta.

[40] Tamasi, G., & Demichela, M. (2011). Risk assessment techniques for civil aviation security. Reliability Engineering & System Safety, 892 - 899. http://dx.doi.org/10.1016/j.ress.2011.03.009.

[41] Triana, A. (2020). Pengembangan Bahan Ajar Modul Berbasis Contextual Learning Kelas IV SD/MI. Lampung. http://repository.radenintan.ac.id/id/eprint/13647.

[42] Utami. (2016). Implementasi E-Learning untuk Meningkatkan Aktivitas Belajar Siswa. Jurnal Komputer Terapan, 169-178. https://jurnal.pcr.ac.id/index.php/jkt/article/view/211/82.

[43] Wahyudono. (2023). Peran Penting Aviation Security dalam Keamanan Penerbangan di Indonesia. Jurnal Pendidikan Tambusai, 21834. https://doi.org/10.31004/jptam.v7i3.9976.

[44] Wong, S., & Brooks, N. (2015). Evolving risk-based security: A review of current issues and emerging trends impacting security screening in the aviation industry. Journal of Air Transport Management, 60-64. http://dx.doi.org/10.1016/j.jairtraman.2015.06.013.

[45] Zacarias, E., Luciano, d. A., Prettz, J. B., & dkk. (2016). Optimizing the Access Records of Students in the Moodle Virtual Learning Environment Database. IFAC, 98 - 101. http://dx.doi.org/10.1016/j.ifacol.2016.11.135.