



## Development of Safety Management System Learning Through MOOCS to Improve Mastery of Aviation Safety Concepts for Cadets

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**Abstract:** This type of research is research and development. The design of the development model in this study uses the ADDIE step (Analysis, Design, Develop, Implementation, Evaluation). However, this article only discusses up to the analysis stage, namely to find out student needs for the development of Introduction to Safety Management System learning through MOOCS. The study was conducted in May-June 2022. The samples in this study were 146 Palembang Poltekbang students who took the Safety Management System course. Sampling is done by purposive sampling technique. The research instrument used was a closed questionnaire consisting of 20 positive statements which is a modification of the Likert Scale with 4 answer choices, namely strongly agree with a score of 4, agree with a score of 3, disagree with a score of 2 and strongly disagree with a score of 1. The results of this study indicate that student agrees to do learning development Introduction To Safety Management System through MOOCS to improve mastery of aviation safety concepts.

**Keywords:** safety management system; moocs; concept mastery; aviation safety

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## INTRODUCTION

Education is recognized as the easiest and most effective strategy to change, at least to direct one's mindset (Sumaryati et al., 2020). Education is said to also play a very important role in determining the quality of human resources (Roseno & Wibowo, 2019). Including human resources in the field of aviation. Quality human resources, of course, must master concepts related to their responsibilities. In the world of aviation, one of the most important is related to flight safety. In the world of education, there are always things that are demanded to make Indonesian education better. Educational institutions and educators in general and including educators at aviation polytechnics today are faced with increasingly severe demands, especially to prepare students to be able to face various dynamics of change that are developing very quickly (Tamami, 2018). The changes that occur are related to the dynamics of changes in science and technology. In accordance with the times that always use technology, education is also experiencing developments in the teaching and learning process that is carried out, one of which is conducting technology-based learning or using the internet (Yodha et al., 2019). The role of technology, which is much greater in the digital era compared to the previous generation, has made the current generation have a high level of technological literacy (Abdulatif, 2021; Cahya & Kusuma, 2019; Elyas, 2018; Hashim, 2018; Khadijah, 2018; Swandhina & Maulana, 2022). To involve students in learning in the digital era requires lecturers to find new ways to adapt the learning system to the characteristics of students as a digitally literate generation (Pagliaro, 2019).

In addition to conducting learning in accordance with the characteristics of the current generation of students, lecturers also have challenges to be able to organize learning in accordance with the demands of the current curriculum. The current curriculum used in higher education is the independent campus learning curriculum (MBKM) which is the most essential curriculum at the higher education level (Baharuddin, 2021; Krishnapatria, 2021). The MBKM curriculum requires an institution to link and match the learning experiences provided to students with employment opportunities (Hayati, 2021; Kodrat, 2021; Latifah et al., 2021; Zunaidi et al., 2021). This curriculum also gives more freedom to students because students will have more opportunities to explore, discuss more freely, do class outings rather than sitting while their lecturer is teaching (Pertiwi & Pusparini, 2021; Wardhani et al., 2022). In implementing the curriculum, it is not uncommon to find obstacles and challenges. The challenges and obstacles that exist then cause the learning process at the aviation polytechnic to be not optimal, especially in the Safety Management System course and several other subjects. This obstacle,

of course, if it drags on, the learning process cannot be carried out properly, so that the quality of learning becomes less good. This will have an indirect impact on the quality of the graduates of the Aviation Polytechnic Cadets that will be produced. Therefore we need an appropriate solution, especially digital learning on how to overcome learning in order to adapt to the demands of the existing curriculum.

In the MBKM curriculum, lecturers and students are also required to adapt to the rapid development of information and communication technology (Yuhastina et al., 2020; Yuherman et al., 2021). Based on this, it is necessary to have an innovation in developing the right learning model 1) this model is able to be a reference for the implementation of the target audience, especially in increasing the mastery of aviation safety concepts for cadets, 2) able to support the implementation of the MBKM curriculum, 3) able to adapt to learning needs Current Poltekbang cadets, 4) Able to support the achievement of the main performance indicators of higher education. One of the learning systems that is becoming a trend and in accordance with the above conditions is the online learning system.

One of the online learning systems that is relatively new in the rapidly growing world of education is MOOCs or Massive Open Online Course (Busri et al., 2019; Hardi et al., 2018). MOOCs is an open learning platform based on the internet with the aim of providing an accessible education for people from all over the world (Barak et al., 2016; Nafa et al., 2021; Rafiq et al., 2019). MOOCs emerged with the Open Educational Resource (OER) movement which ushered in an era of open online education and massive online learning (Pilli & Admiraal, 2020; Risdianto et al., 2021; Xiong & Suen, 2018). From the description above, the researchers conducted a study entitled development of safety management system learning through MOOCs to improve mastery of aviation safety concepts.

## METHODS

This type of research is research and development. The design of the development model in this study uses the ADDIE step (Analysis, Design, Develop, Implementation, Evaluation). However, this article only discusses up to the analysis stage, namely to find out student needs for the development of Introduction to Safety Management System learning through MOOCs. The study was conducted in May-June 2022. The samples in this study were 146 Poltekbang Palembang students who took the Safety Management System course. Sampling is done by purposive sampling technique. The research instrument used was a closed questionnaire consisting of 20 positive statements which is a modification of the Likert Scale with 4 answer choices, namely strongly agree with a score of 4, agree with a score of 3, disagree with a score of 2 and strongly disagree with a score of 1.

The questionnaire was tested for validity and reliability using SPSS with the following conditions. Valid: if  $r_{\text{count}}$  is greater than  $r_{\text{table}}$  value ( $r_{\text{count}} > r_{\text{table}}$ ), Invalid: if  $r_{\text{count}}$  is smaller than  $r_{\text{table}}$  value ( $r_{\text{count}} < r_{\text{table}}$ ), Reliable if Cronbach's alpha value  $> 0.60$ , and Unreliable if Cronbach's alpha value  $< 0.60$  (Budiwibowo & Nurhalim, 2016). Where P is the percentage of the results of the questionnaire analysis, n is the total score of the assessment, and N is the maximum possible score. For the Likert scale, the score interpretation model can be seen in table 1.

**Table 1. Likert Scale Interpretation**

| Percentage (%) | Category          |
|----------------|-------------------|
| 0% - 25%       | Strongly Disagree |
| 26% - 50%      | Don't agree       |
| 51% - 75%      | Agree             |
| 76% - 100%     | Strongly agree    |

(Hayati et al., 2015)

## RESULT AND DISCUSSION

The purpose of this study is to analyze the needs of student needs for the development of Introduction to Safety Management System learning through MOOCs. In this study, 146 students who became respondents were asked to fill out a questionnaire consisting of 20 positive statements. Each question item used in the questionnaire was tested for validity and reliability to determine whether the instrument was feasible or not suitable for use in obtaining the data needed by researchers. For the results of the validity test of the student needs analysis questionnaire, it can be seen in the following table:

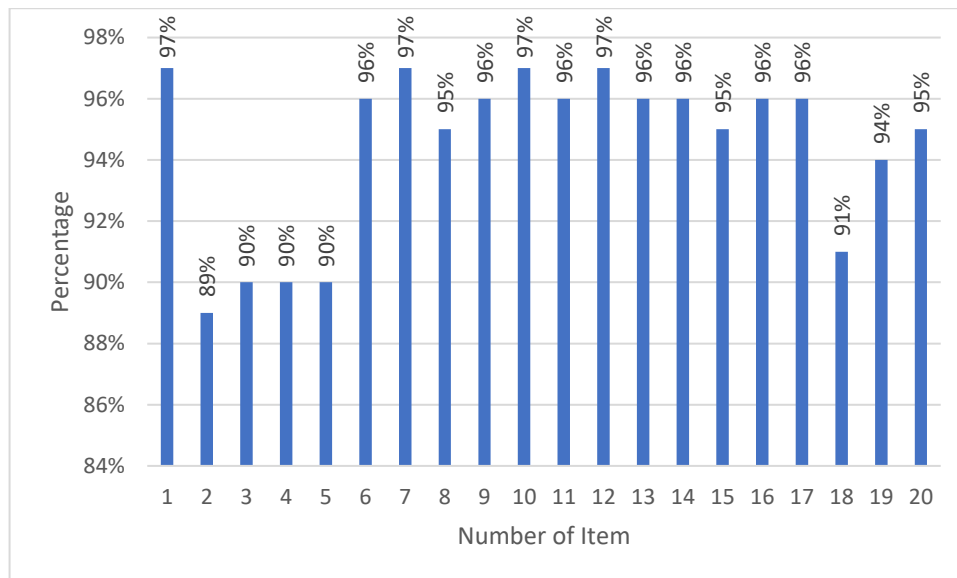
**Table 2. Case Processing Summary**

|       |          | N   | %     |
|-------|----------|-----|-------|
| Cases | Valid    | 146 | 100.0 |
|       | Excluded | 0   | 0.0   |
|       | Total    | 146 | 100.0 |

| <b>Table 3. Reliability Statistics</b> |                   |
|----------------------------------------|-------------------|
| <b>Cronbach's Alpha</b>                | <b>N of Items</b> |
| 0.926                                  | 20                |

In the case processing summary table for the student needs analysis questionnaire, it can be seen that there are 146 respondents who answered the statement (N) was valid. There is no data excluded (Excluded). A total of 146 data (N) were processed or 100% of the data were processed. In table 3 reliability statistics show the results of the calculation of data reliability using the Cronbach alpha method with a score of 0.926. The value obtained is greater than 0.60, then according to the rules of determining reliability, the questionnaire used in this study is said to be reliable.

The percentage of answers for each item can be seen in the following picture:



**Figure 1.** Percentage of Results of Filling Out Questionnaire

From the graph above, it can be seen that all items get a percentage from the lowest, which is 89% and the highest, which is 97%. It shows that all items are in the 76%-100% range, which means that they fall into the category of strongly agree. All items made are items with positive criteria so that when the data from the analysis are in the category of agree or strongly agree to support the hypothesis that students need for the development of learning Introduction to Safety Management System through MOOCs.

In detail, students like learning that uses electronic devices such as computers and cellphones and is internet-based. In addition, students also agreed that they liked audio-visual-based learning such as videos and according to them the material in the Introduction to Safety Management System course is suitable if delivered via video and suitable if done through a distance learning system using learning videos such as the MOOCs (Massive Open Online Course) program. They also expect theory in the Introduction to Safety Management System can be accessed anytime and anywhere and the material is presented in a sequential or structured manner so that they will be more enthusiastic about learning it. Students also agreed that they prefer learning where they can monitor their own learning progress and they like learning where the material can be studied repeatedly so that they can improve their mastery of concepts about aviation safety.

In terms of needs, students agree that they need a learning system that can help them understand the meaning of aviation safety scientifically both in theory and in its application in everyday life, they need a learning system that can improve their ability to construct meaning or understanding based on their initial knowledge of aviation safety, they need a learning system which can improve their ability to describe a problem or object about aviation safety into its elements and determine how the interrelationships between these elements are, they need a learning system that can improve their ability to make a judgment based on existing criteria and standards regarding aviation safety, they need learning that can improve digital literacy skills, learning that presents material that they can learn independently. Learning materials are presented in various forms such as video tutorials, animations, audio and others. The reason they think is because the material conveyed through the video is easier to master because it is accompanied by moving images. In addition, the material delivered via video is also can save direct learning time between educators and students because the material can be played over and over again independently by students. From the characteristics of the learning system in the Introduction to. Course safety management system desired by the students mentioned above, strongly refers

to the characteristics of the online learning system through MOOCs. Because it can be concluded that students agree to do learning development introduction to safety management system through MOOCs to improve mastery of aviation safety concepts.

There are several previous studies that are relevant to this research, including research conducted by (Johan, 2016). In his research, Johan uses MOOCs in learning to improve information literacy competence for school librarian teachers. Then the research conducted by Ismail et al. (2018) entitled Development of massive open online course (MOOC) based on ADDIE model for catering courses which concludes that the MOOC application can help students improve student performance and achievement in learning so that it can be an alternative to diversify the teaching and learning process in VC. Then there is research conducted by Husna (2019) entitled Implementation of MOOCs in Library and Information Science Education (An Opportunity and Challenge in Indonesia) which concludes that it is true that MOOCs will bring opportunities for librarians to improve library professional education and library and information science skills. After that there was also research conducted by (Poerwanto, 2019). In his research, Poerwanto analyzed the implementation of the safety management system to improve flight safety.

The results of several previous studies have shown that the positive impact of using MOOCs has been felt by various parties in the world of education. So it is not only beneficial for educators in carrying out teaching and learning activities but also beneficial for other parties such as librarians. One of the reasons why MOOCs can be one of the fastest growing methods in the world of education today is because MOOCs use methods that are in accordance with the times. The MOOCs system that utilizes technology whose material is integrated in the form of video is very in line with the characteristics of the current generation which is always dealing with technology and media in the form of audio-visual.

## CONCLUSION

Based on the results of the research obtained, it was concluded that the students agreed to develop the Introduction to Safety Management System through MOOCs to improve mastery of aviation safety concepts.

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## REFERENCES

- Abdulatif, S. (2021). Dampak Pandemi Terhadap Eksistensi Pendidikan di Era Digital. *Jurnal Pendidikan Tambusai*, 5(1 (2021):), 1567–1570. <https://jptam.org/index.php/jptam/article/view/1140/1021>
- Baharuddin, M. R. (2021). Adaptasi Kurikulum Merdeka Belajar Kampus Merdeka (Fokus: Model MBKM Program Studi). *Jurnal Studi Guru Dan Pembelajaran*, 4(1), 195–205.
- Barak, M., Watted, A., & Haick, H. (2016). Motivation to learn in massive open online courses: Examining aspects of language and social engagement. *Computers and Education*, 94, 49–60. <https://doi.org/10.1016/j.compedu.2015.11.010>
- Budiwibowo, A. K., & Nurhalim, K. (2016). Pengaruh Motivasi Belajar Terhadap Prestasi Belajar Warga Belajar Kejar Paket C. *Journal of Nonformal Education*, 2(2), 168–174.
- Busri, E., Zulirfan, Z., & Fakhruddin, F. (2019). The Development of MOOC Media to Increase Recall Memory Skill on Physics at Vocational High School. *Journal of Physics: Conference Series*, 1(1), 1–4. <https://doi.org/10.1088/1742-6596/1351/1/012017>
- Cahya, B. T., & Kusuma, N. A. (2019). Pengaruh Motivasi dan Kemajuan Teknologi Terhadap Minat Investasi Saham. *Jurnal Ilmu Ekonomi Dan Keislaman*, 7(2), 192–207.
- Elyas, A. H. (2018). Penggunaan Model Pembelajaran E-Learning dalam Meningkatkan Kualitas Pembelajaran. *Jurnal Warta*, 56(April), 1–11.
- Hardi, R., Gunawan, & Sumardi. (2018). Pendekatan Baru Teknologi Mooc Sebagai Media Pembelajaran Pada Matakuliah Pemrograman. *SNITT- Politeknik Negeri Balikpapan 2018*, 317–323. <https://jurnal.poltekba.ac.id/index.php/prosiding/article/view/612>
- Hashim, H. (2018). Application of Technology in the Digital Era Education. *International Journal of Research in Counseling and Education*, 2(1), 1–5. <https://doi.org/10.24036/0022a0002>
- Hayati. (2021). Evaluasi Peserta Magang Di Instansi Pemerintahan Dengan Metode Bekerja Di Rumah (Studi Kualitatif Sebagai Persiapan Magang Merdeka Belajar Kampus Merdeka). *Jp3Sdm*, 10(2), 54–71.

- Hayati, S., Budi, A. S., & Handoko, E. (2015). Pengembangan Media Pembelajaran Flipbook Fisika untuk Meningkatkan Hasil Belajar Peserta Didik. *Prosiding Seminar Nasional Fisika (e-Jurnal) SNF2015*, 4, 49–54.
- Husna, J. (2019). Implementasi MOOCs di Pendidikan Ilmu Perpustakaan dan Informasi (Sebuah Peluang dan Tantangan di Indonesia). *Anuva: Jurnal Kajian Budaya, Perpustakaan, Dan Informasi*, 3(3), 247–256. <http://ejournal.undip.ac.id/index.php/anuva>
- Ismail, M. E., Utami, P., Ismail, I. M., Hamzah, N., & Harun, H. (2018). Development of massive open online course (MOOC) based on addie model for catering courses. *Jurnal Pendidikan Vokasi*, 8(2), 184–192. <https://doi.org/10.21831/jpv.v8i2.19828>
- Johan, R. C. (2016). Massive Open Online Course (Mooc) Dalam Meningkatkan Kompetensi Literasi Informasi Guru Pustakawan Sekolah. *PEDAGOGIA Jurnal Ilmu Pendidikan*, 13(1), 203. <https://doi.org/10.17509/pedagogia.v13i1.3382>
- Khadijah, C. (2018). Transformasi perpustakaan untuk generasi millennial menuju revolusi industri 4.0. *IQRA': Jurnal Ilmu Perpustakaan Dan Informasi (e-Journal)*, 12(2), 59. <https://doi.org/10.30829/iqra.v12i2.3983>
- Kodrat, D. (2021). Mindset Mutu Manajemen Perguruan Tinggi Islam Dalam Program Merdeka Belajar Kampus Merdeka (MBKM). *Jurnal Ilmu-Ilmu Agama*, 3(1), 48–61.
- Krishnapatria, K. (2021). Merdeka Belajar-Kampus Merdeka (MBKM) curriculum in English studies program: Challenges and opportunities. *ELT in Focus*, 4(1), 12–19. <https://doi.org/10.35706/eltinf.v4i1.5276>
- Latifah, S., Gibran, Z., Saadiah, H., Prasetyawijaya, G., Soraya N. C. A., Al Imam, A., Dwi Mustika, B. A., Lasmini, N., & Ahmad, Z. (2021). Pertukaran Pelajar Unram-UPM : Inovasi Pembelajaran Mbkm Dalam Menumbuhkan Ketangguhan Lulusan Sarjana Kehutanan. *Jurnal PEPADU*, 2(1), 46–51. <https://doi.org/10.29303/jurnalpepadu.v2i1.290>
- Nafa, Y., Sutomo, M., & Sahlan, M. (2021). Inovasi Pembelajaran Pendidikan Agama Islam di Era Revolusi Industri 4.0 Melalui Media Massive Open Online Course (MOOC). *Journal of Islamic Education Research*, 2(2), 133–146. <https://doi.org/10.35719/jier.v2i2.173>
- Pagliaro, M. (2019). Chemistry Education Fostering Creativity in the Digital Era. *Israel Journal of Chemistry*, 59(6), 1–7. <https://doi.org/10.1002/ijch.201800179>
- Pertiwi, A. K., & Pusparini, R. (2021). Vocational High School English Teachers' Perspectives on “Merdeka Belajar” Curriculum. *Edukatif: Jurnal Ilmu Pendidikan*, 3(5), 1982–1992.
- Pilli, O., & Admiraal, W. (2020). A Taxonomy of Massive Open Online Courses. *Contemporary Educational Technology*, 7(3), 223–240. <https://doi.org/10.30935/cedtech/6174>
- Poerwanto, E. (2019). The Analysis of Implementing Safety Management System (SMS) to Improve The Flight Safety. In *Conference SENATIK STT Adisutjipto Yogyakarta*, 5, 17–26. <https://doi.org/10.28989/senatik.v5i0.345>
- Rafiq, K. R. M., Hashim, H., Yunus, M. M., & Pazilah, F. N. (2019). Developing a MOOC for communicative english: A battle of instructional designs. *International Journal of Innovation, Creativity and Change*, 7(7), 29–39.
- Risdianto, E., Wachidi, W., Riyanto, R., Alexon, A., Fathurrochman, I., & Kusen, K. (2021). Blended Learning Model Based on Massive Open Online Courses (MOOCs) Assisted by Augmented Reality (BMA) Model as the Electronic Learning Media in the Pandemic Covid-19. *AL-ISHLAH: Jurnal Pendidikan*, 13(1), 228–241. <https://doi.org/10.35445/alishlah.v13i1.470>
- Roseno, I., & Wibowo, U. B. (2019). Efisiensi eksternal pendidikan kejuruan di Kota Yogyakarta. *Jurnal Akuntabilitas Manajemen Pendidikan*, 7(1), 15–24. <https://doi.org/10.21831/amp.v7i1.10558>
- Sumaryati, Murtiningsih, S., & Maharani, S. D. P. (2020). Penguatan Pendidikan Antikorupsi Perspektif Esensialisme. *Jurnal Antikorupsi, INTEGRITAS*, 6(1), 1–14. <https://jurnal.kpk.go.id/index.php/integritas/article/view/408>
- Swandhina, M., & Maulana, R. A. (2022). Generasi Alpha : Saatnya Anak Usia Dini Melek Digital Refleksi Proses Pembelajaran Dimasa Pandemi Covid-19. *Jurnal Edukasi Sebelas April (JESA)*, 6(1), 1–9.
- Tamami, B. (2018). Peran Guru Pendidikan Agama Islam Terhadap Pendidikan Karakter Siswa Di Sma Sultan Agung Kasiyan- Puger-Jember Tahun Pelajaran 2016/2017. *Jurnal Tarlim*, 1(1), 21–30.
- Wardhani, G. A. P. K., Susanty, D., Oksari, A. A., Nurhayati, L., Nuranzani, A., & Faridha, F. (2022).

- Implementasi Kurikulum Merdeka Belajar Kampus Merdeka (MBKM) Di Program Studi Kimia Universitas Nusa Bangsa. *Jurnal Pendidikan Dan Pembelajaran Sains Indonesia (JPPSI)*, 5(1), 53–59. <https://ejournal.undiksha.ac.id/index.php/JPPSI/article/view/42802>
- Xiong, Y., & Suen, H. K. (2018). Assessment approaches in massive open online courses: Possibilities, challenges and future directions. *International Review of Education*, 64(2), 241–263. <https://doi.org/10.1007/s11159-018-9710-5>
- Yodha, S., Abidin, Z., & Adi, E. (2019). Persepsi Mahasiswa Terhadap Pelaksanaan E-Learning Dalam Mata Kuliah Manajemen Sistem Informasi Mahasiswa Jurusan Teknologi Pendidikan Universitas Negeri Malang. *Jurnal Kajian Teknologi Pendidikan*, 2(3), 181–187. <https://doi.org/10.17977/um038v2i32019p181>
- Yuhastina, Y., Parahita, B. N., Astutik, D., Ghufonudin, G., & Purwanto, D. (2020). Sociology Teachers' Opportunities and Challenges in Facing "Merdeka Belajar" Curriculum in the Fourth Industrial Revolution (Industry 4.0). *Society*, 8(2), 732–753. <https://doi.org/10.33019/society.v8i2.234>
- Yuherman, Y., Nugroho, W., & Sunarsi, D. (2021). Dampak Kebijakan MBKM Pada Kesiapan Sumber Daya Manusia dan Fasilitas Fakultas Hukum Usahid Jakarta. *MORALITY: Jurnal Ilmu Hukum*, 7(2), 222. <https://doi.org/10.52947/morality.v7i2.235>
- Zunaidi, A., Fatmawatie, N., Natalia, S. A., & Mushlihin, I. A. (2021). Penguatan Pemahaman dan Orientasi Kurikulum Kampus Merdeka dalam Menyambut Merdeka Belajar-Kampus Merdeka. *Batuah: Jurnal Pengabdian Kepada Masyarakat*, 1(2), 1–7.