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Integrating Learning Management System and Clasification Learning Media Based On Two Dimension Animation

I Nyoman Agus Suarya Putra*[1], Ni Luh Sustiawati[2], Anak Agung Gde Bagus Udayana[3], I Wayan Suardana[4]
[1,2]Fakultas Bisnis dan Desain Kreatif, Institut Bisnis dan Teknologi Indonesia, Bali
[2,3,4]Program Studi Seni, Institut Seni Indonesia Denpasar,
e-mail: ***[1]nyomansuarya@instiki.ac.id**, [2]sustiawati@isi.ac.id, gede.udayana@isi.ac.id, suardana@isi.ac.id

Abstract

This research aims to combine the advantages of LMS technology with the potential of two-dimensional animated learning media in an educational context. This research explores the basic concept of a Learning Management System (LMS) and its advantages in providing a structured platform for delivering learning material, student-teacher interaction, and evaluating learning progress. LMS offers broad accessibility, student progress tracking, and the ability to facilitate collaborative learning. The research focus shifted to the potential of two-dimensional animation-based classification learning media. Two-dimensional animation offers interesting and engaging visualizations and can help students understand complex concepts better. In this context, this research integrates the visual power of animation with the learning structure provided by the LMS. By combining LMS with two-dimensional animated learning media, this research aims to create a more dynamic and effective learning experience. This integration is expected to increase student engagement, facilitate a deeper understanding of concepts, and increase information retention. In addition, this combination is also expected to improve the overall quality of teaching by enabling the use of more innovative and interactive teaching methods. This research aims to contribute to our understanding of how learning technology can be integrated effectively to improve student's learning experiences. Thus, it is hoped that the results of this research can provide valuable insight into the development of better learning practices in this digital era.

Keywords—*Learning Management System, classification, 2D animation, media learning*

1. INTRODUCTION

The background to the importance of learning with a Learning Management System (LMS) has become increasingly significant along with the development of information and communication technology [1]. LMS allows better accessibility to learning materials and courses, not limited by time and place. Students can access materials whenever and wherever they are, enabling distance learning, self-based learning, and lifelong learning. LMS also facilitates storage and sharing of learning materials in digital format. Teachers can easily upload materials, assignments, reading materials, videos and other resources to the platform that can be accessed by the entire class or study group. LMS allows the integration of various learning tools and technologies, such as learning videos, discussion forums, online quizzes, and real-time collaboration [2]. This creates a more integrated and interactive learning experience for

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students. One of the important points in an LMS is the learning media used [3], [4].

The learning media is a form of media product that combines elements of text, learning media, images, graphics and sound to produce information and games that are interesting and have many benefits, one of which is to facilitate learning and user attention [4]. In order to run smoothly, media requires the help of complete devices such as computers. The term media itself comes from one word, namely media. This term shows that there are many media involved in the process of conveying the message. Media is media that uses many forms of content and information processing, to inform or entertain its users. Media also refers to the use of electronic media to store and copy media content. Media is similar to traditional mixed media in fine arts, but with a broader scope. The use of this teaching media will be shown to young children, who have a tendency to get more attention from this media. According to an expert, early childhood children at the Nurul Auladi Kindergarten are taught about recognizing animal habitats to provide knowledge about types of animals and how to care for them. This can be seen from the syllabus used as a learning reference. In this way, children don't feel interested because the colors are still black and white, it doesn't really look like what it is. Message communication can be disrupted, which can lead to misunderstanding of basic knowledge.

Classification of learning media in the Learning Management System (LMS) is an important approach in improving the effectiveness and efficiency of the online learning process. With the emergence of information and communication technology, LMS has become an indispensable platform in supporting distance education, online-based learning, and technology-based learning [5]. Classification of learning media in an LMS refers to the grouping and arrangement of various types of learning material, including video, text, images and other interactive resources, making it easier to access and use by teachers and students, especially young children. The importance of classification of learning media in LMS includes several aspects. First, this classification helps in the organization and structuring of learning content, making it easier for LMS users to navigate and find the required material more quickly and efficiently. It also facilitates systematic organization and management of courses, assisting teachers in structuring learning materials according to the curriculum and students' learning needs [6].

The development of technology over time is very fast, requiring teachers to adapt to learning methods that use technology, so that students gain knowledge quickly and easily[7], [8]. Teachers are required to have learning media devices that are able to attract students to understand the knowledge provided. One of them is good presentation skills. Adobe animate is software that can be used to create presentations complete with 2D animation learning media. With this device, it is planned that learning media will be very easy to access, both by teachers as educators at school and parents at home to help with homework. In designing digital-based teaching media, the media designed has the advantage of displaying real illustrations and animations that arouse interest, the media is made in full color on a digital basis using a QR code that is attached to the material book. Users find it easier to access with existing Android devices[9], [10]. Media can automatically speak, convey knowledge so that it has similarities in the concept of discussion with books. Digital media is able to convey messages effectively to all groups, both teachers and the public. From the description above, the title is taken in this writing. Design and Construction of Learning Media for Introduction to Animal Habitats in Raudhatul Athfal Nurul Auladi Based on 2D Animation.

2. METHODS

2.1 Learning Managemen System

The use of E-learning, which has been widely implemented in all agencies, is certainly no stranger to hearing. Proper implementation of E-learning must also require good

management. Web-based learning or what is often called LMS (Learning Management System) is one model that is widely used in implementing E-learning. This LMS (Learning Management System) has offered various advantages in implementing E-learning both in terms of methods, models that are faster, practical, comfortable and easy for students to use and understand. In a school context, a Learning Management System is a system designed to display, track, report and manage learning content, student progress and student interaction. In essence, LMS (Learning Management System) has the ability to manage web-based learning administration, for example registration and providing test scores, providing teaching materials in various formats. Learning Management System or LMS is often known as an effort system carried out by an agency that will, is or wants to carry out management of a learning system, both design and process assessment [11].

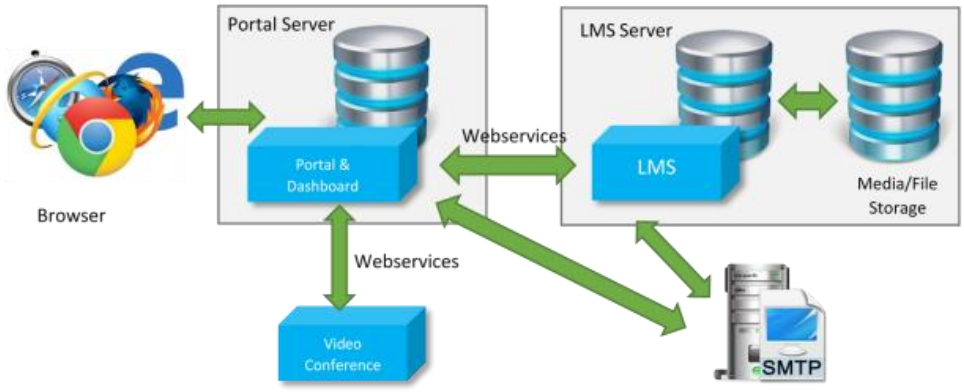

Fig 1 LMS Architecture

LMS (Learning Management System) based learning is a platform in the form of software that is integrated with administrators, users and content creators with learning management accessibility. Then in its use and effectiveness of the LMS (Learning Management System) because this software is more flexible and can be used at any time. In other words, LMS (Learning Management System) is an application-based learning model with software in a network, electronic learning program.

2.2 Clasification with KNN

Using the E-learning K-Nearest Neighbor (KNN) algorithm is a method for classifying objects based on learning data that is closest to the object. Learning data is projected into a multidimensional space, where each dimension represents a feature of the data. The KNN algorithm is a method that uses a supervised algorithm[12], [13]. The difference between supervised learning and unsupervised learning is that supervised learning aims to find new patterns in data by connecting existing data patterns with new data . Meanwhile, in unsupervised learning, the data does not yet have any patterns, and the goal of unsupervised learning is to find patterns in data[14]. The working principle of KNN is to find the shortest distance between the data to be evaluated and its K nearest neighbors in the training data. This technique is included in the nonparametric classification group[15]. Here we do not pay attention to the distribution of the data we want to group. This technique is very simple and easy to implement. Similar to the clustering technique, grouping new data based on the distance of the new data to several data/nearest neighbors. In the classification process, this algorithm does not use any model to match and is only based on memory[16], [17].

The KNN algorithm uses neighborhood classification as a prediction value from new test data. The distance used is Euclidean Distance. Euclidean distance is the most commonly used distance in numerical data. The best K value for this algorithm depends on the data. In general, a high K value will reduce the effect of noise on classification. The special case where

the classification is predicted based on the closest training data is called the KNN algorithm. In general, to define the distance between two objects x and y, the Euclidean distance formula is used in equation 1, where d is the proximity distance, x is the testing data, y is the training data and n is the number of attributes 1 to n [18].

$$dxy = \sqrt{\sum} (x_i - y_i \; n \; i{=}1 \;)^2 \qquad (1)$$

2.3 Lerning media

Learning media is any tool that can be used as a channel for messages to achieve learning objectives. (Ashar, 2011) Says that learning media is a tool that helps in the learning process both inside and outside the classroom, further explaining that learning media is a component of learning resources or physical vehicles that contain instructional material in the student environment that can stimulate students to learn. Meanwhile, according to learning media is a tool that helps in the learning process.

Fig 2 Types of learning media

To obtain good quality learning media so that it can have a significant influence on the teaching and learning process, it is necessary to select and plan the use of good and appropriate learning media. Choosing the right learning media makes learning media effective in use and not in vain if applied. Media selection criteria originate from the concept that learning media is part of the overall instructional system. So several criteria that need to be considered in selecting good learning media (Muali, 2018: 9-10) are in accordance with the objectives achieved. The learning media used must be in accordance with the objectives achieved. This goal can be shown in the form of tasks that must be done/fulfilled by students. b) Appropriate to support lesson content in nature, concepts, principles, or generalizations. c) Learning media must be practical, flexible, and sustainable. d) Teachers are skilled in using it. e) The media created must be by the teacher's abilities. f) Technical quality. The visual quality of the media must be clear and neat, it must not be disturbed by other elements such as the layout or background of the media.

2.4 Animation 2D

2D animation is animation that uses sketched images that have a two-dimensional environmental space, moved one by one so that they appear real and moving. Apart from being used in the field of art, the term two-dimensional is used in the computer field, especially in

computer graphics or the process of creating images using a computer. Animation initially only consisted of pieces of illustrative or photographic images which were then moved so that they appeared to be alive. Animation can be said to be a movement simulation created by displaying sequential images or frames. Animated films are not only for entertainment for children but can also be used in various fields, because animated films contain information that is conveyed to the audience [19]. From several definitions or limitations regarding animation, in principle there are several elements that must be considered in this definition, namely: Pose to pose and Inbetween (image movement), Timing (time movement of characters), Secondary Action (secondary movement), Acceleration, Anticipation , Follow through and Overlapping Action Arc (curved movement), Dramatization of Movement and Elasticity [20].

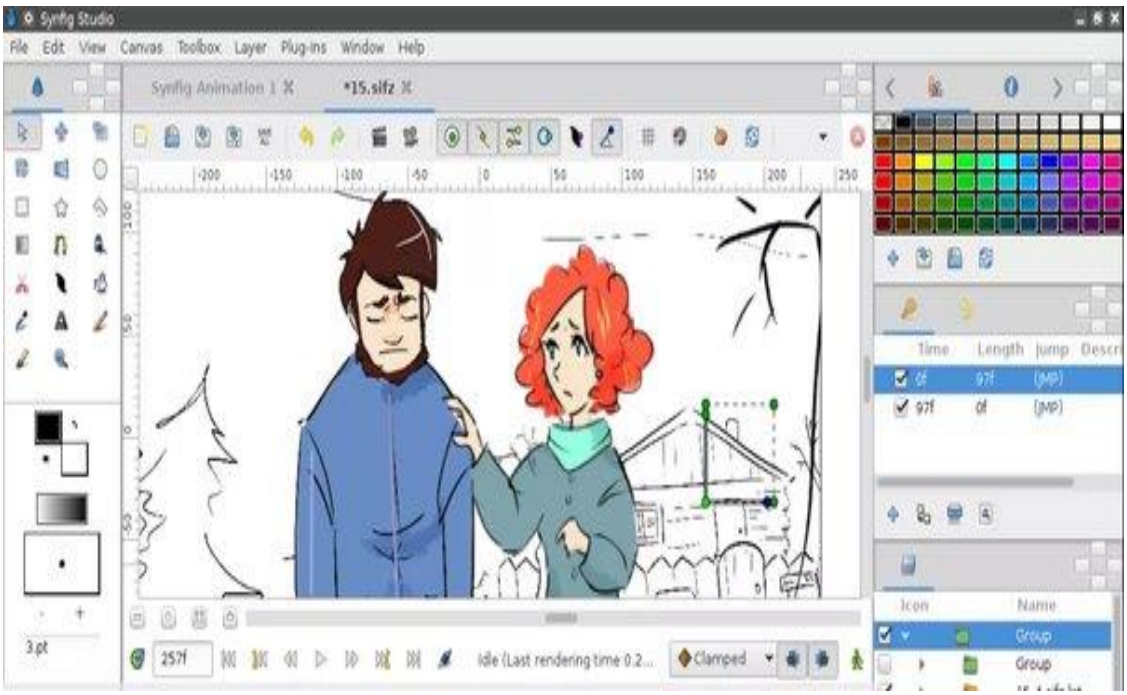

Fig 3 Animation 2D

3. RESULTS AND DISCUSSION

3.1 Learning management system templete

The Learning Management System (LMS) is implemented as in Figure 4, where the software platform is designed to facilitate and support the online learning process. LMS allows schools to deliver learning materials, manage content, track participant progress, and manage interactions between students and teachers. The components contained in the LMS in Figure 4 include, Content Management, User Management, Course Management, Interaction and Communication, Evaluation and Tracking, Collaborative Learning Facilities, Customization Capabilities, Analysis and Reporting. The advantages of using an LMS are ease of access, flexibility in time and place, management efficiency, and increased participant interaction and involvement. By using an LMS, educational institutions and organizations can increase learning accessibility, increase administrative efficiency, and improve the student learning experience.

3.2 Classification of learning media using KNN

The K-Nearest Neighbors (KNN) method is used to classify learning media, where this method is one of the classification algorithms used in machine learning. In the context of learning media, KNN can be used to carry out classification based on certain features or attributes in learning media. The following is an example of classification in learning media

using the KNN method. There is a collection of learning media data which consists of several attributes such as, video duration, number of links in the learning material, suitability of the material to the curriculum, level of difficulty of the material, rating or feedback.

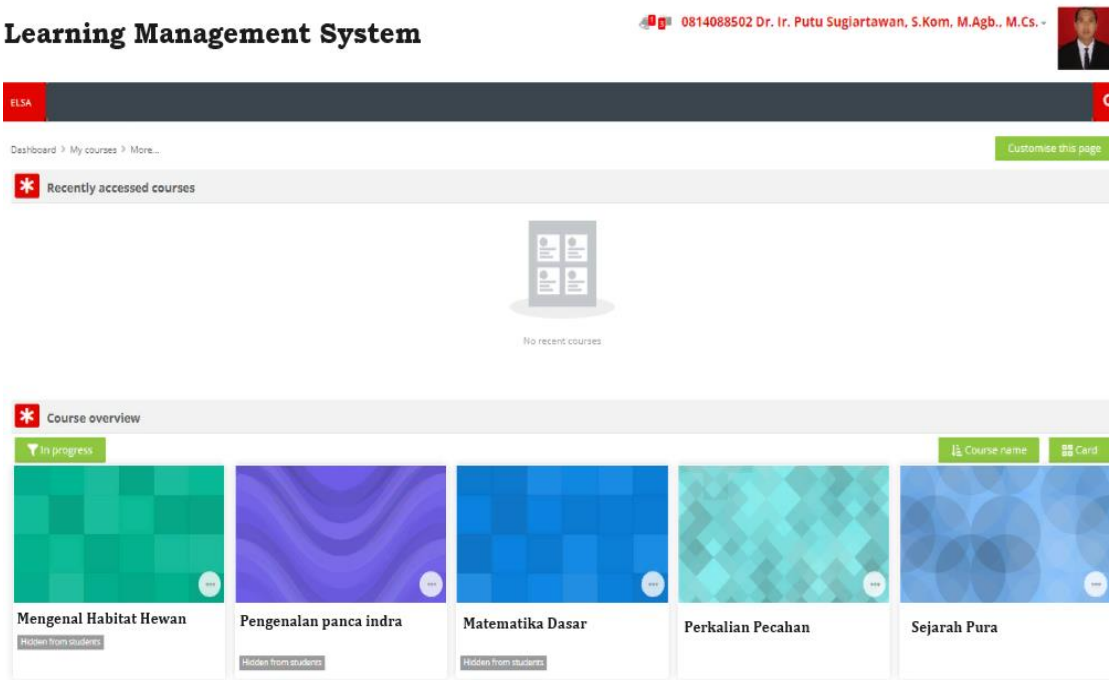

Fig 4 LMS For Student

Classification of new learning media into certain categories based on these attributes. Calculations carried out using the KNN method:

1. Data Preparation: Prepare training data consisting of examples of learning media that have been labeled with certain categories or classes based on their attributes.
2. Feature Selection: the features that will be used in the classification process. In this example, these features are video length, number of links, curriculum suitability, difficulty level, and rating.
3. Normalization: Normalization or standardization of the features used so that they have the same value range. This is important because KNN uses the distance between data as the basis for calculations.
4. Selection of Parameter K: Select parameter K, namely 4, namely the number of nearest neighbors that will be used in the classification process.

Table 1 Learning media parameters

Category	Video Duration	Number of Links	Suitability	Rating	Class
1	15	5	1	4	A
1	10	10	0	3	B
2	25	25	0	2	C
2	40	50	1	1	D
1	15	7	1	1	A

By using the KNN method, new learning media can be classified into certain categories based on the features they have. This method can help in grouping or categorizing learning materials according to certain needs or characteristics.

3.3 Implementation Learning Media

The production stage is also known as the stage of compiling all the elements in making learning media, where the pictures will be taken following the storyboard that has been made.

1. Work area Preparation of the work area is the first stage in preparing the work area with a 16:9 aspect ratio measuring 1920 x 1080 to follow the 16:9 aspect ratio.
   Process, the process carried out in this learning media is data collection at RA Nurul Auladi then observation, data processing and storyboarding.
2. Test Render, At this stage the file is in the form of. MP4, after doing a test render, the user needs to review the results. And make revisions if necessary.
3. Duration This learning media about animal habitats has a duration of 4 minutes.
4. Backsound Selection of background sound that will be used in learning media.
5. Voice Over Record voice over sound which will later be used for dubbing in the learning media that will be created.
6. Animation Assets Prepare animation assets that will be used in creating learning media.
7. Post-Production This stage is the post-production process followed by the final stage, namely merging between scenes and adding transitions, sound, and others via Adobe Animate software.

Storyboards are used as a reference so that learning media is in line with concepts or ideas which has been made. The explanation in the picture is as follows:

1. In the animation display there is a background in the animation display.
2. Duration: 05:10.
3. Camera: Front View.
4. Action: displays writing about living animals on land.
5. Effect: animation of living animals on land appears.
6. Sound: Backsound and actors' voices.
7. Narration/Dialogue: Your friends must have seen animals, birds, cats, chickens, and many more. So, do you know that animals are divided into 3 types according to their habitat, what are they, let's look at them together, first, the Bali starling, you must have seen this animal that often flies, right? Well, the Bali starling is included in the category of living animals. on land, apart from Bali starlings, there are also other animals that live on land, namely cows, dogs, deer, ants, and others..

Fig 5 Storyboard for media learning

The athor scane show the material about animal, a.In the animation display there is a background in the animation display. b. Duration : 00:10. c. Camera: Front View. d. Action: displays writing about amphibian animals e. Effect: Animated amphibian animals appear. f. Sound: Backsound and actor's voice. g. Narration/Dialogue: Then turtles, friends, you must have seen this animal, right? Well, turtles fall into the category of animals that live in two realms, on land and in water, or commonly known as amphibians, besides turtles, there are also other animals that live in two realms, namely crocodiles, rice field frogs, toads, and others.x

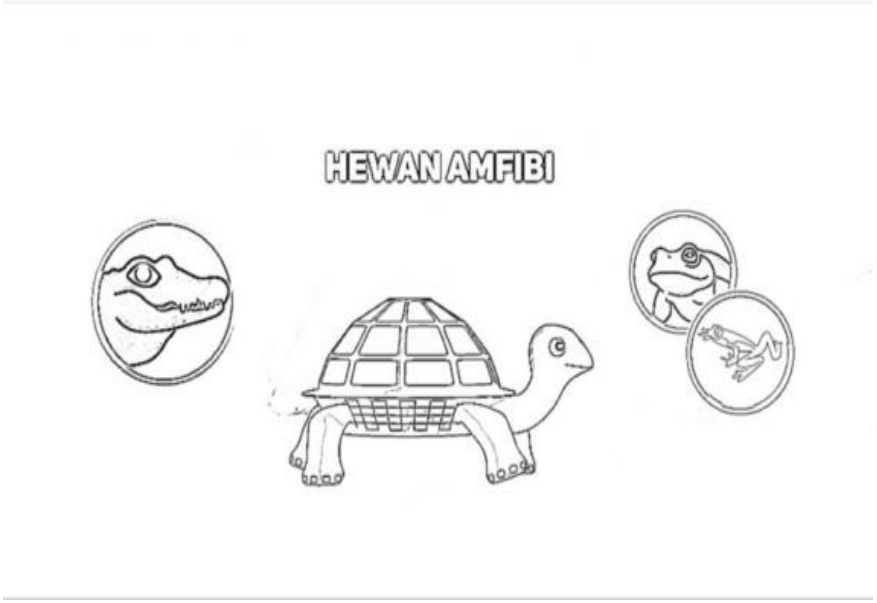

Fig 6 Storyboard for content media learning

4. CONCLUSIONS

In conclusion, the integration of Learning Management Systems with classification-based learning media, such as Two-Dimensional animation, offers a multifaceted approach to enhance educational experiences. By leveraging the strengths of each component, educators can create personalized, engaging, and effective learning environments that empower students to succeed. Media. pembelajaran dengan judul Rancang Bangun Media pembelajaran Pengenalan Animal Habitat at RA Nurul Auladi Based on 2D Animation. This 2D animation was designed and built through several stages, the first is data collection, data analysis as the initial stage of designing animal habitat learning media, then after the design continues, it is processed through an application that can create animation, audio and media. mesegeh tradition for the seka truna-truni in the Selumbung Traditional Village. In realizing this 2D animation about animal habitats, it includes several stages, namely pre-production, production and post-production. In the pre-production stage, storyboards are made, assets starting from characters, backgrounds and other assets, then continued with the process of making 2D animation scans of animal habitats. Media testing was carried out on media experts Mr. Ngakan Putu Darma Yasa, S.Kom., M.Sn., and Mr. Kadek Agus Arya Saputra, S.Kom., as media experts also stated that they agreed that the learning media was in the form of 2D animation regarding the habitat of this animal. it is worthy of publication. From the results of tests carried out on content expert sources, namely Mrs. Laili, S.Pd., Mrs. Soelistijowati, M.Pd., and Mrs. Siti Qomariyah, S.Pd., they said that this animated learning media about animal habitats was suitable for publication. The results of testing carried out using 35 RA Nurul Auladi students showed that 35 students strongly agreed, 5 students agreed that they were helped or happy with the animated learning media regarding animal habitats, as well as in anecdotal notes regarding whether the material presented in this 2D animated learning media was useful. well understood.

REFERENCES

[1] A. M. Almelhi, "Effectiveness of the ADDIE Model within an E-Learning Environment in Developing Creative Writing in EFL Students," *English Lang. Teach.*, vol. 14, no. 2, p. 20, 2021.

[2] N. I. S. Rakhmawati, S. Mardliyah, R. Fitri, D. Darni, and K. Laksono, "Pengembangan Learning Management System (LMS) di Era Pandemi Covid-19 pada Pendidikan Anak Usia Dini," *J. Obs. J. Pendidik. Anak Usia Dini*, vol. 6, no. 1, pp. 107–118, 2021.

[3] I Made Dedy Setiawan, Ryan Pratama Putra, and Putu Sugiartawan, "Media Pembelajaran Interaktif Pada Materi Klasifikasi Hewan untuk Siswa Sekolah Dasar," *J. Imiah Pendidik. dan Pembelajaran*, vol. 6, no. 3, pp. 588–598, 2023.

[4] N. Made, R. Trisnayanti, and P. Sugiartawan, "Multimedia Interaktif Infografis Desa Agro Kreatif Bingin Ambe Koripan Berbasis Android," *J. Sist. Inf. dan Komput. Terap. Indones.*, vol. 5, no. 2, pp. 63–74, 2022.

[5] E. P. Cynthia and E. Ismanto, "Metode Decision Tree Algoritma C.45 Dalam Mengklasifikasi Data Penjualan," *J. Ris. Sist. Inf. Dan Tek. Inform.*, vol. (3) Juli, no. July, pp. 1–13, 2018.

[6] P. Sugiartawan and S. G. Santoso, "Multivariate Forecasting Curah Hujan Menggunakan," *Semin. Nas. Corisindo Inst. Teknol. dan Bisnis STIKOM Bali*, pp. 580–585, 2022.

[7] N. A. Ariani, Sugiartawan Putu, and N. . Agetania, "Analisis CRM Menggunakan Aplikasi Power BI PT. Terang Abadi Raya," *J. Sist. Inf. dan Komput. Terap. Indones.*, vol. 3, no. 3, pp. 142–153, 2022.

[8] N. M. G. Dewi and P. Sugiartawan, "Aplikasi Web Perhitungan Kelayakan Finansial Pada Agrowisata Desa Kreatif Bingin Ambe Koripan," *JSIKTI J. Sist. Inf. dan Komput. Terap. Indones.*, vol. 5, no. 2, pp. 53–62, 2022.

[9] M. A. Rizky, P. Sugiartawan, P. Studi, and T. Informatika, "Sistem Informasi Kegiatan Kelompok Tani Di UPT HPT Dan Keswan Praya Timur 1,2," vol. 5, no. 2, pp. 87–96, 2022.

[10] P. Sugiartawan, I. G. T. Suryawan, and I. G. A. Indawan, "Sistem Informasi Keuangan Pada Koperasi Karya Utama Mandiri," *J. Sist. Inf. dan Komput. Terap. Indones.*, vol. 5, no. 2, pp. 97–108, 2022.

[11] I. Al Rasyid, D. Winarso, and R. Asrianto, "analisis tingkat kepuasan pengguna terhadap penerapan learning management system (lms) ujian online menggunakan metode e-servqual Keywords : Analisis Kepuasan Pengguna , Learning Management System (LMS), ujian online , E-Servqual , Siswa / I SMA Muham," *Sist. Inf. Univ. Muhammadiyah Riau*, vol. 1, no. 1, pp. 80–85, 2020.

[12] P. Sugiartawan and I. G. N. Desnanjaya, "Smart Farming Untuk Pengaturan Suhu Ruangan Pada Budidaya Jamur Tiram Berbasis Backpropagation," *IJEIS (Indonesian J. Electron. Instrum. Syst.*, vol. 12, no. 2, p. 191, 2022.

[13] I. G. Made, N. Desnanjaya, and P. Sugiartawan, "Controlling and Monitoring of Temperature and Humidity of Oyster Mushrooms in Tropical Climates," no. x.

[14] I. G. I. Sudipa, I. K. A. G. Wiguna, D. P. Asana, I. N. T. A. Putra, and P. Sugiartawan, "Combination of Macbeth Method and Rank Order Centroid Techniques in Determining the Best Tourism Location in East Bali," *Proceeding Int. Conf. Inf. Technol. Multimedia, Archit. Des. E-bus.*, vol. 2, no. 0 SE-Articles, pp. 39–45, 2022.

[15] P. Sugiartawan, S. Hartati, and A. Musdholifah, "Modeling of a tourism group decision support system using risk analysis based knowledge base," *Int. J. Adv. Comput. Sci. Appl.*, vol. 11, no. 7, pp. 354–363, 2020.

[16] I. wayan Sudiarsa, P. Sugiartawan, I. G. I. Sudipa, N. M. Maharianingsih, and I. K. A. Putra, "Sistem Pengering Daun Kelor Berbasis Internet of Things dan Artificial Intteligence," *IJEIS (Indonesian J. Electron. Instrum. Syst.*, vol. 13, no. 2, p. 183, 2023.

[17] I. W. Sudiarsa, I. G. I. Sudipa, P. Sugiartawan, N. M. Maharianingsih, and N. K. N. N.

Pande, "Information System for Monitoring Production Process of Dried Kelor Leaf Dried Using the FAST Method," *Sinkron*, vol. 8, no. 4, pp. 2748–2756, 2023.

[18] H. Islami and A. Armiati, "Efektivitas Penggunaan Modul Pembelajaran Berbasis Kontekstual Pada Bidang Keahlian Bisnis Dan Manajemen Di Sekolah Menengah Kejuruan (SMK): Literature Review," *J. Ecogen*, vol. 3, no. 4, p. 498, 2020.

[19] D. E. Nurcahyo, "Pembuatan Modul Elektronik (E-Modul) Sebagai Solusi Pembelajaran Di Masa Pandemi Covid-19 Pada Mata Kuliah Animasi Grafis Di Prodi Film Dan Televisi Isi Surakarta," *Pros. Seni, Teknol. Dan Masy.*, vol. 4, no. 1, pp. 36–45, 2021.

[20] S. H. Nisrina, R. I. Rokhmawati, and T. Afirianto, "Pengembangan E-modul Berbasis Project Based Learning (PjBL) pada Mata Pelajaran Animasi 2 Dimensi dan 3 Dimensi untuk Meningkatkan Hasil Belajar Peserta Didik," *Edu Komputika J.*, vol. 8, no. 2, pp. 82–90, 2021.