



Development of a web-based futsal learning model methodology

Afri Tantri^{1*}, Amansyah¹, Raswin¹, Muhammad Ishak¹, Argubi Silwan¹, Bobby Helmi², Benny Aprial²

¹Universitas Negeri Medan, Indonesia

²Sekolah Tinggi Olahraga dan Kesehatan Bina Guna, Indonesia

*Corresponding Author: afritantri241271@gmail.com

ABSTRACT

Based on background and research objectives, this study is expected that students in learning independently will be more efficient, helping students' knowledge, competence, and academic achievement in futsal courses. The purpose of this research is to produce a learning model for basic futsal technical skills based on world wide web (www), with product results packaged in the form of applications that can be used both in learning activities and in independent practice to facilitate the delivery of Futsal course learning material. This study uses research and approaches adopted from Borg and Gall which are grouped into three stages, 1) identification stage, 2) development stage, and 3) evaluation stage. The results of the effectiveness test above where the world wide web learning model in the futsal course was tested on 30 students of the faculty of sports science and the results obtained were eleven people were effective on student thinking skills, nine people were quite effective, six people were less effective and two people were not effective on the use of the word wide web learning model. The conclusion of the research results through the web-based Futsal learning model can increase students' knowledge and skills in playing Futsal effectively and efficiently collaboration.

Keywords: development, media, futsal, learning model, web application

Article history

Received:
20 January 2025

Revised:
22 February 2025

Accepted:
13 April 2025

Published:
29 May 2026

Citation (APA Style): Tantri, A., Amansyah, A., Raswin, R., Ishak, M., Silwan, A., Helmi, B., & Aprial, B. (2026). Development of a Worldwide based futsal learning model (WEB) methodology. *Cakrawala Pendidikan: Jurnal Ilmiah Pendidikan*, 45(2), pp.467-475. DOI: <https://doi.org/10.21831/cp.v45i2.82731>

INTRODUCTION

Web-based Learning Media is a learning media that is used in the learning process by using web-based software that contains learning content which includes: title, objectives, learning materials, and learning evaluations. This is in line with what was stated by previous researchers who stated that computer systems can deliver learning individually and directly to students / learners by interacting with subjects programmed into computer systems, this is what is called web-based learning (Mahiroh et al., 2024). Learning media is an integrated set of strategy components, such as ideas about a particular way of sequencing learning, the use of overviews and summaries, the use of examples, practice and summarization, the use of different strategies to motivate students (Aldera et al., 2024). The research results of a systematic review highlight the potential of web-based media in distance education, emphasizing their role in providing flexible and comprehensive learning resources (Nababan et al., 2023). These studies collectively underscore the versatility and effectiveness of web-based learning media in improving educational experiences and outcomes across a variety of educational contexts.

The concept of "Worldwide based" or web-based systems is explored across various domains in the provided paper, highlighting the versatility and wide application of web technologies. The research results of developing an online exam application using a monolithic architecture demonstrate the benefits of web-based systems in educational settings, providing flexibility for students who are unable to attend a physical exam location (Malčík et al., 2002).

The integration of web-based systems across multiple sectors underscores their role in improving accessibility, efficiency, and user engagement, reflecting a broader trend toward digital transformation across industries (McLean, 2016). The system utilizes technologies such as PHP, MySQL, and frameworks such as Codeigniter to create robust, user-friendly applications that meet a wide array of needs, from health management to education and beyond.

The coaching and development of educational sports is carried out through a learning process carried out by qualified lecturers and has a certificate of competence and is supported by adequate sports facilities and infrastructure. Graduates of the Physical Education study program are expected to be able to develop knowledge in the field of physical education and sports and can become competent and professional teaching staff in the field of physical education and sports, one of which is to become educators, trainers, and sports coaches in the community. All students majoring in Physical Education have the obligation to pass practical courses, one of which is the Futsal course in the odd semester. However, we need to know that the material in the Futsal course includes: the history of the development of Futsal, Filling Ball, Kicking, Stopping the Ball, Dribbling, Headers, Goalkeepers, and Futsal Game Rules. To be able to have good knowledge and skills to play Futsal, a planned, programmed and systematic teaching strategy approach is needed. The relevance of technology integration in sports learning is also supported by Artanayasa et al. (2023), who emphasized that digital technology in physical education can support learning and teaching by strengthening students' active experiences and helping them develop the skills, attitudes, and knowledge needed for lifelong activities. In football learning, android-based applications have also been developed to support performance assessment and provide more practical data for evaluating students' basic skills. Therefore, the development of a web-based futsal learning model is consistent with the growing need to integrate digital tools into sports education.

Based on observations and experiences as well as applications in the field of researchers who have implemented research products using application media in an interactive multimedia-based android cellphone system, textbooks and the use of websites in Basic Soccer Skills courses, the results of students' knowledge and skills have significantly increased, supported by data from the physical education study program in the 2022 and 2023 memberships, most students get grades B and A. First, the level of difficulty in mastering the knowledge and skills of Futsal. Second, the learning model that is not interesting and varied. Second, the learning model is not interesting or varied. Third, students lack interest in learning and practicing independently in the field. Fourth, there is still a lack of ability of lecturers in developing learning media. Learning resources have many variants ranging from learning resources from people, printed books, audio, video, computers, the internet, and even smartphones. Digital learning resources are increasingly important because they allow learning materials to be presented in contextual, visual, auditory, attractive, and interactive forms. Rusydiyah et al. (2020) also explain that useful learning resources should be available, accessible for independent learning, and able to meet learners' needs. In this context, a web-based futsal learning model can serve as a flexible learning resource that supports students' independent practice and understanding of basic futsal techniques. Given that in the information era 4.0 as it is today, the use of technology in learning students is facilitated to access information, especially those related to learning quickly, easily, quality, and interestingly. The utilization of science and technology, especially in the development of Web-based learning resource packaging, is needed because learning resources can be packaged in a more attractive and more complete form in its presentation.

Media utilization in the history of educational development, information technology is part of the media used to convey messages of knowledge to many people, starting from printing technology several centuries ago, such as printed books, to telecommunications media such as, sound recorded on cassettes, videos, television, CDs, cellphones and learning via the internet (e-learning) (Salam et al., 2020). Learning is still emphasized in the form of "teacher centered" lecturers as the center so that students lack knowledge and freedom in performing maximum movement skills (Sappaile et al., 2015). This media development research, researchers chose HP applications, as learning media, and will be uploaded to the Web network, this media can understand the speed of student learning, be able to become a patient tutor because it is a program,

can be used by lecturers when teaching, and giving lectures and can be used independently by students as a learning resource.

The purpose of this development research is to produce learning media for Web-based Futsal courses, with product results in the form of HP applications, printed books uploaded on the network. The hope is that with Web Applications, and inserting material in the form of images and videos into the website, it is hoped that students in learning and independent practice or learning will be more effective and efficient so that students' knowledge and competence and academic achievement will increase and can be maximized in mastering the knowledge of the Futsal Sports Game course.

METHOD

This study uses a research and development approach to development research adopted by Borg and Gall (1983) which is grouped into three stages. The subjects of this study were all students of physical education, health and recreation at Medan State University who took Futsal courses. The research sample at stage 1 trial to 40 students (1 class). Phase 2 trials for 70 people.

The research stages are (1) Identifying Stage, at this stage the developer's first step is to identify learning needs, which is the first step in this research. The goal is to achieve course learning, formulation of teaching materials and re-design of learning tools (syllabus, RPS and lecture contracts) as well as question grids. (2) Development stage, product development of Web-based media for Futsal learning. Perform steps, among others: (1) Creating a storyboard, creating a development flow, to complete the product. (2) Making a development flowchart in the form of a flowchart. (3) Collecting materials to make products, such as material, animation, audio, clip-art images, video models and will be uploaded on the website (4) validation and feasibility tests. (3) Evaluation stage consisting of formative evaluation with steps: review by soccer experts and media experts, one-to-one evaluation, small group evaluation, and field trials. If there are improvements in the formative evaluation, revisions will be made. The following are the steps of the model development plan shown in Figure 1, which describes each step and stage after the following Figure 1.

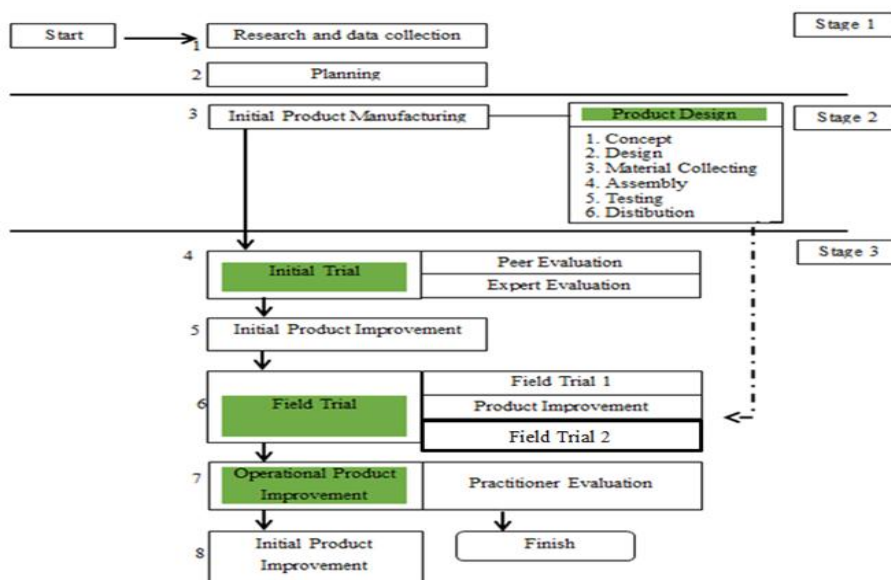


Figure 1. Flow Chart of WEB-Based Development Research

The data for this study were collected through observation, interviews and document studies as well as tests and measurements. The analysis used quantitative and qualitative assessments. Quantitative is done to get the score and percentage of the product developed and the assessment of learning outcomes in the form of questions. While qualitative getting suggestions and input for revision and improvement of products.

FINDINGS AND DISCUSSION

For ease of reading and comprehension, findings are presented first, followed by discussion. It should provide a concise and precise description of the experimental results, the interpretation, and the conclusions that can be drawn. The Findings subtitle and Discussion subtitles are presented separately. This section should occupy a minimum of 60% of the whole body of the article.

Findings

Research & data collection

The research and data collection stage was conducted to identify the main problems and learning needs in the futsal course. The identification process was based on classroom observations, field experiences, and supporting documents related to students' learning outcomes and lecturers' use of learning media. The results showed several problems: (a) students' theoretical and practical learning outcomes in futsal were still low; (b) observations of several futsal events and competitions in Medan indicated that the performance of sports students, particularly FIK Unimed students, still needed improvement; (c) students required more varied learning tools and training models; and (d) lecturers had not yet used innovative media optimally in delivering futsal learning materials.

Planning

After the potential and issues can be shown genuinely, then important to gather different data can be utilized as material for arranging. The researcher searched for related research journals, similar research, and media concepts during the process of data collection. Coming up next are the analysts' discoveries in the information assortment stages: a) Significant examination, This exploration utilizes improvement research techniques, to be specific: (1) fundamental examination, data assembling and needs examination, (2) starting item advancement, (3) assessment of three training specialists, (4) preliminary little gathering (20 individuals), (5) first item correction, (6) enormous gathering preliminary (40 individuals), (7) eventual outcome update, (8) video script detailing, (9) end result in VCD structure. Evaluation sheets, questionnaires, and tests to measure dribbling ability in futsal games make up the research instruments. The consequences of the master assessment survey before the little gathering preliminary were 79.1% (Great), the little gathering preliminary 80.67% (Great), the expansion in the futsal game spill capacity test in the little gathering preliminary was 12%, the master assessment poll after the preliminary the little gathering was 76.7% (Great), the enormous gathering preliminary was 84% (great), the expansion in the spill capacity test in the huge gathering preliminary was 9%, and the master assessment poll after the enormous gathering preliminary was 75.8%. b) Reference research. Dribble motion futsal is a drill for learning the fundamentals of good dribbling. Dribbling usually has no set rules other than goals and a clear direction.

Initial product manufacturing

A new design or a new product could be the end result of a series of initial research. The following Figure 2 are just a few of the study's research product designs.

Initial trial

The procedure of obtaining the evaluation of experienced experts to determine whether a new product or work design is rationally feasible. The product trial was conducted on a small group of twenty FIK Unimed students during the stage of design validation. The trials conducted with 20 students in small groups produced the following outcome
In the little gathering preliminary consequences of 20 FIK Unimed understudies, the principal respondent got a level of 76.67%, the subsequent respondent got a level of 78.33%, the third respondent got a level of 76.67%, the fourth respondent got a level of 75%, the 6th respondent got a level of 80 %, the seventh respondent got a level of 78.83%, the eighth respondent got a

level of 85%, the 10th respondent got a level of 80%, the 10th respondent got a level of 78.33%, the 11th respondent got a level of 80%, the twelfth respondent got a level of 83.33% , the thirteenth respondent got a level of 76.67%, the fourteenth respondent got a level of 76.67%, the fifteenth respondent got a level of 83.33%, the sixteenth respondent got a level of 88.33%, the seventeenth respondent got 78.33%, the eighteenth respondent got a level of 75%, the nineteenth respondent got a level of 85%, and the 20th respondent got 73.33%. The score that was obtained from the small group trial was 952 and the overall percentage of respondents who fell into the Valid category was 79.33 percent. This indicates that the product can be utilized with students and that product validation is satisfactory in small group trials. In the small group trial, the answers to the following questions received the highest scores for the statement: a) Students stated that the global based learning model was sufficient to improve students' ability to think critically and that they strongly supported the learning media. b) Students expressed strong agreement that exposure to the global learning model increased students' enthusiasm for improving their dribbling, passing, and shooting skills. c) Students stated that they strongly agreed that students referred to the learning model when learning.

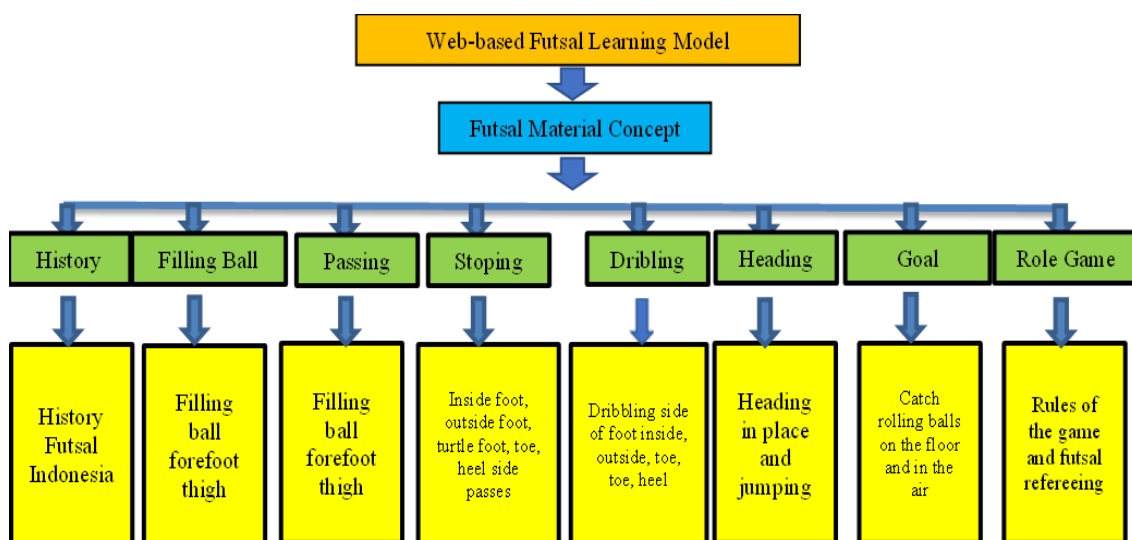


Figure 2. Roadmap Product

Initial product improvement

After weaknesses have been identified, the product designed is revised. In the item plan amendment technique, what the specialist does is do modifications given by specialists. In small group trials, the results of expert revisions are as follows: Zen Fadly, M.Pd., a physical condition expert, revised the results with a score of 13 and a valid category percentage of 88.66%. The subsequent revision by futsal expert Irwansyah Siregar, M.Pd., received a score of 12 and a valid percentage of 80%. The expert's overall score was 25 with an 83.33% (valid category) percentage.

Notwithstanding, there are a few updates given by specialists to be rectified prior to doing huge gathering preliminaries, to be specific: a. Zen Fadly, M.Pd., a physical conditioning expert, emphasized that, in small group tests, students did not participate optimally in exercise variations where the movements were not carried out optimally. As a result, students' speed, agility, and endurance in technical variations were not carried out optimally. As a result, recommendations for the subsequent test must be carried out optimally because the training is regarded as a competition so that the physical condition elements in the training variations can be trained simultaneously with technical training; b. Irwansyah Siregar, M.Pd., where he emphasized that the exercise must be carried out in accordance with the guidebook's variations during the small group trial. because the expert realized that several exercises were skipped for each cone despite following the guidebook's instructions. In order to ensure that exercise variations are treated correctly, recommendations for large-scale trials emphasize providing students with as many explanations as possible.

Field trial

Conducting limited trials. At the product trial stage, the researchers conducted a large group trial on 40 students and conducted a large group trial on 40 students. The following are the large group trials in this study.

Table 1. Effectiveness test results with N-Gain test

No	Pre Test (X1)	Post Test (X2)	N-Gain Score	N-Gain Score (%)	Category
11	70	90	0.666666667	66.67	Effective enough
22	55	80	0.555555556	55.56	Ineffective
33	50	70	0.4	40.00	Effective
44	55	70	0.333333333	33.33	Effective enough
55	65	75	0.285714286	28.57	Effective enough
66	60	80	0.5	50.00	Effective
77	70	85	0.5	50.00	Effective
88	55	85	0.666666667	66.67	Effective enough
99	50	90	0.8	80.00	Less effective
110	55	95	0.888888889	88.89	Effective enough
111	60	95	0.875	87.50	Less effective
112	50	70	0.4	40.00	Effective
113	60	75	0.375	37.50	Effective
114	75	75	0	0.00	Effective enough
115	70	65	-0.166666667	-16.67	Effective
116	70	80	0.333333333	33.33	Less effective
117	75	85	0.4	40.00	Effective
118	75	75	0	0.00	Effective enough
119	70	85	0.5	50.00	Effective enough
220	75	100	1	100.00	Effective
221	80	80	0	0.00	Effective
222	70	85	0.5	50.00	Effective
223	80	85	0.25	25.00	Effective enough
224	80	90	0.5	50.00	Less effective
225	80	75	-0.25	-25.00	Ineffective
226	50	65	0.3	30.00	Ineffective
227	65	85	0.571428571	57.14	Less effective
228	75	70	-0.2	-20.00	Effective
229	50	100	1	100.00	Less effective
330	50	65	0.3	30.00	Effective

In the acquisition of a small group trial of 40 students consisting of students, the first respondent obtained a percentage of 81.67%, the second respondent obtained a percentage of 83.33%, the third respondent obtained a percentage of 81.67%, the fourth respondent obtained a percentage of 88.33%, the fifth respondent obtained a percentage of 81.67%, the sixth respondent obtained a percentage of 83.33%, the seventh respondent obtained a percentage of 81.67%, the eighth respondent obtained a percentage of 88.33%, the ninth respondent obtained a percentage of 81.67%, the tenth respondent obtained a percentage of 83.33%, the eleventh respondent obtained a percentage of 81.67%, the twelfth respondent obtained a percentage of 88.33%, the thirteenth respondent obtained a percentage of 81.67%, the fourteenth respondent obtained a percentage of 88.33%, the fifteenth respondent obtained a percentage of 85%, the sixteenth respondent obtained a percentage of 88.33%, the seventeenth respondent obtained 83.33%, the eighteenth respondent obtained a percentage of 80%, the nineteenth respondent obtained a percentage of 88.33%, the twentieth respondent obtained 91.67%, the twenty-first respondent gained 81.67%, the twenty-second respondent gained 86.67%, the twenty-third respondent gained 86.67%, the twenty-fourth respondent gained 85%, the twenty-fifth respondent gained 90%, the twenty-sixth respondent gained 83.33%, the twenty-seventh respondent gained 80%, the twenty-eighth respondent gained 90%, the twenty-ninth respondent gained 85%, the thirtieth respondent gained 81.67%, The thirty-first respondent obtained a percentage of 88.33%, the thirty-second

respondent obtained a percentage of 88.33%, the thirty-third respondent obtained a percentage of 78.33%, the thirty-fourth respondent obtained a percentage of 86.67%, the thirty-fifth respondent obtained a percentage of 85%, the thirty-sixth respondent obtained a percentage of 88.33%, the thirty-seventh respondent obtained a percentage of 86.67%, the thirty-eighth respondent obtained a percentage of 80%, the thirty-ninth respondent obtained a percentage of 89.47% and the fortieth respondent obtained a percentage of 90%. In the large group trial, the overall score was 2022 with an overall percentage of 84.25% in the valid category.

This means that the product of the worldwide based learning model on futsal material can be tested for effectiveness on 30 students. The following is the effectiveness test Table 1. Based on the results of the effectiveness test (See Table 1), where the world wide web learning model in the futsal course was tested on 30 students and the results obtained were 11 people were effective on student thinking skills, 9 people were quite effective, 6 people were less effective and 2 people were ineffective in using the word wide web learning model.

Discussion

This research is relevant to the improvement of electronic futsal learning models including creating internet-based stages to improve futsal instruction and ability. Web-based systems can be used in a variety of ways for futsal-related activities, according to research. For example, research has focused on developing a web-based futsal court rental information system to streamline data management and facilitate customer bookings (Sonia & Cahyaningtyas, 2023). In addition, futsal courses can benefit from the use of online teaching resources that can be accessed via two-dimensional quick response codes, thus allowing students with internet access to learn on their own (Rahayu & Mushofi, 2020). In addition, futsal facilities such as D'Soccer Karawang have found that implementing a web-based system has improved customer satisfaction, operational efficiency, and data management for field bookings (Hidayatullah & Ardiansah, 2022). However, in the context of physical education, web-based learning should be designed not only as a medium for accessing materials but also as a learning environment that supports practice, interaction, feedback, and assessment. Raharjo et al. (2025) found that students' positive perceptions of online microteaching did not always correspond to their practical competence in real teaching situations. This finding strengthens the argument that technology-based learning in physical education must remain connected to real performance demands. Therefore, the web-based futsal learning model developed in this study should be understood as a medium that supports both students' conceptual understanding and their practical performance in futsal learning.

The development of futsal learning models and media has been explored through various innovative approaches, as evidenced by research conducted in various educational contexts. A comprehensive web-based futsal learning model that effectively enhances futsal education and skills can be developed by integrating these findings (Restu Ilahi et al., 2023). There are many approaches and considerations involved in creating a futsal learning model. Innovative models to improve passing skills, defensive strategies, and overall game play have been the focus of research. Effective training models for futsal players at different educational levels have been developed using research and development methods, biomechanical studies, and expert validation (Imam et al., 2022). The models, for example, are based on biomechanical principles, cooperative team achievement divisions, and tactical strategies such as the "BEYB" defense tactic. These models are intended to further develop the ability of passing methods, increase the fun and viability of instructional courses, and equip players with different ability settings and systems to succeed in futsal (Nugroho et al., 2023). This diverse approach underscores the potential of cooperative learning strategies and technological innovations in enhancing futsal education, providing educators with a variety of tools to increase student engagement and skill acquisition in futsal courses.

Futsal learning has been explored through a variety of innovative educational strategies and technologies, each contributing to improved student skills and engagement in the sport. Audiovisual learning has been shown to be highly effective in teaching basic futsal techniques in schools, improving motor development, motivation, and coordination among students. Other

research results also suggest the integration of 3D Augmented Reality (AR) in Android-based learning media has also been validated as suitable for improving practicum learning outcomes in futsal, providing an interactive and engaging platform for students (Restu Ilahi et al. 2023). In addition, a mobile learning platform has been developed to teach the basic techniques and rules of futsal, with digital books providing accessible and engaging content for learners. The platform has been validated through piloting, showing a high level of acceptance among users (Yuniarto et al., 2018). The results of futsal learning model development research around the world have been explored through various innovative approaches, integrating technology and pedagogical strategies to improve learning outcomes. One significant advance is the use of mobile learning platforms, such as digital books, which have been shown to increase enthusiasm and accessibility for learning basic futsal techniques and rules, achieving high validation scores in pilot tests (Jameel & Hamoo, 2024). Collectively, this study highlighted the diverse methodologies and technologies that can be used to optimize futsal learning, each offering unique benefits that cater to different aspects of skill development and student engagement.

The results obtained in this development research have implications for several parties in the world of education. The implications result in the form of a world wide (web) based futsal learning model design which will be used both in learning activities and in independent practice to make it easier to deliver Futsal course learning material and make it easier for lecturers to achieve the expected goals and produce teaching material products for Futsal courses based on “Blended Learning” included in the learning management system content or also called LMS as it is also known, can be considered as a type of online content management or online content delivery platform. It is used to deliver training and education materials to students or external users via the Internet.

This research and development has been attempted and carried out in accordance with existing procedures, however, it still has limitations, namely, the research time used in this study is relatively short when in fact the implementation of learning requires a longer time and requires large financing.

CONCLUSION

The hope is that by developing Web-based futsal learning, and incorporating material in the form of images and videos into the learning website, it is hoped that students in learning and independent practice or learning will be more effective and efficient so that the knowledge and competence and academic achievement of students will increase and can be maximized in mastering the knowledge of the Futsal Game Sports course. This contribution of this research by presenting various variations and combinations by applying learning variation models in Futsal learning, through smartphones, laptops and on the website network. The results of the study are used as a model for developing learning system designs by both students and lecturers in the future.

REFERENCES

- Aldera, A., Arwansyah, & Fitrawaty. (2024). Development media learning audio visual based on web blog for increasing economy learning result. *International, Randwick Science, Linguistics*, 5(1), 244–252.
- Artanayasa, I. W., Kusuma, K. C. A., Satyawan, I. M., & Mashuri, H. (2023). The android-based instrument for performance assessment of football. *Cakrawala Pendidikan: Jurnal Ilmiah Pendidikan*, 42(1), 110-119. DOI: <https://doi.org/10.21831/cp.v42i1.52483>
- Borg, W. R. & Gall, M. D. (1983). *Educational research: An introduction*. Longman.
- Hidayatullah, D., & Ardiansah, T. (2022). Web-based Futsal field facility rental and service reservation information system with waterfall method. *Journal of Information Technology and Systems (JTSI)*, 3(3), 64–68. DOI: <https://doi.org/https://doi.org/10.33365/jtsi.v3i3.1994>
- Imam, C., Sukriadi, S., & Prabowo, E. (2022). Futsal passing learning model using cooperative type student teams-achievement division method. *Journal of Sport Education*, 11(2), 255–

264. DOI: <https://doi.org/https://doi.org/10.31571/jpo.v11i2.4538>
- Jameel, R., & Hamoo, O. (2024). Constructing an offensive situations to measure the tactical behavior in kick of futsal players using virtual reality technology. *Al-Rafidain Journal For Sport Sciences*, 27(84), 1–23. DOI: <https://doi.org/10.33899/rjss.2021.132181.1036>
- Mahiroh, F. F., Suryanti, & Azizah, U. (2024). Website-based learning media to improve elementary school students' reproductive health literacy. *International Journal of Elementary Education*, 8(1), 167–177. DOI: <https://doi.org/10.23887/ijee.v8i1.63786>
- Malčík, M., Peter, N., & Do, T. (2002). The World wide web in learning and teaching. *Conference: Information and Communication Technology in Education*, 1(1), 1–25. <https://www.researchgate.net/publication/262067817>
- McLean, S. F. (2016). Case-based learning and its application in medical and health-care fields: A review of worldwide literature. *Journal of Medical Education and Curricular Development*, 3, JMECD.S20377. DOI: <https://doi.org/10.4137/jmecd.s20377>
- Nababan, D., Wijayanti, A. P., Rico, Nashrallah, M. N., & Sari, W. A. S. (2023). Web-based learning media for distance education: A review. *Jurnal Penelitian Pendidikan IPA*, 9(12), 1342–1353. DOI: <https://doi.org/10.29303/jppipa.v9i12.5827>
- Nugroho, A., Helmi, B., Lubis, A. E., Aditya, R., & Alfariysi, F. R. (2023). Contribution of price, location, and facilities to interest in renting futsal fields after the covid-19 pandemic. *European Union Digital Library*. DOI: <https://doi.org/10.4108/eai.28-10-2022.2327444>
- Raharjo, H. P., Kusuma, D. W. Y., Mohamed, A. M. D., Rahayu, T., Annas, M., Putra, R. B. A., Suropto, A. W., & Kurniawan, W. R. (2025). Analysis of the online microteaching practice among undergraduate physical education students' competence. *Cakrawala Pendidikan: Jurnal Ilmiah Pendidikan*, 44(1), 63-71. DOI: <https://doi.org/10.21831/cp.v44i1.61743>
- Rahayu, E. D., & Mushofi, Y. (2020). Quick respon code for futsal teaching materials. *Journal of Physical Education, Sport and Health*, 4(1), 183–194. DOI: <https://doi.org/10.33503/jp.jok.v4i1.1171>
- Restu Ilahi, B., Syafril, & Fina Hiasa. (2023). Development of futsal learning media based on augmented reality 3d visualization to improve physical education students practicum learning results. *Kinestetik: Jurnal Ilmiah Pendidikan Jasmani*, 7(3), 833–842. DOI: <https://doi.org/10.33369/jk.v7i3.28524>
- Rusdiyah, E. F., Purwati, E., & Prabowo, A. (2020). How to use digital literacy as a learning resource for teacher candidates in Indonesia. *Cakrawala Pendidikan*, 39(2), 305-318. DOI: <https://doi.org/10.21831/cp.v39i2.30551>
- Salam, R., Akib, H., & Daraba, D. (2020). Utilization of learning media in motivating student learning. *Proceedings of the 1st International Conference on Social Sciences*, 226(Icss), 1100–1103. DOI: <https://doi.org/10.2991/icss-18.2018.232>
- Sappaile, B. I., Abidin, J., & Aisyah, S. (2015). Video utilization in improving student achievement in early childhood education. *International Journal of Language and Ubiquitous Learning*, 2(2), 302–313. DOI: <https://doi.org/10.70177/ijlul.v2i2.977>
- Sonia, S. D. F., & Cahyaningtyas, C. (2023). Design of web-based futsal field rental information system. *Journal of Science and Computing*, 7(02), 1–4. DOI: <https://doi.org/10.61179/jurnalinfact.v7i02.448>
- Yuniarto, A., Supriyadi, S., & Sudjana, I. N. (2018). Development of learning media based on mobile learning basic techniques and rules of the game futsal. *Journal of Physical Education, Sport and Health*, 2(1), 51–62. DOI: <https://doi.org/10.33503/jpjok.v2i1.188>