



The Effectiveness of Cooperative Learning Model Assisted by Learning Management System in Improving Learning Outcomes

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ABSTRAK

Menurunnya pemahaman dan hasil belajar mahasiswa pada mata kuliah disebabkan karena model pembelajaran dan media sebagai alat bantu yang digunakan dalam menyampaikan materi kurang maksimal. Adanya kesenjangan antara teori, harapan dan realita di lapangan, membuat penelitian ini urgen untuk diteliti dengan tujuan untuk meningkatkan pemahaman dan hasil belajar mahasiswa pada mata kuliah dengan model pembelajaran kooperatif dengan bantuan Learning Management System (LMS). Metode penelitian yang digunakan adalah Research and development (R&D) dengan metode ADDIE. Subjek penelitian adalah mahasiswa yang berjumlah 40 orang. Produk yang dikembangkan adalah model pembelajaran kooperatif. Teknik pengumpulan data dengan validasi produk, instrumen, pre-test dan post-test. Teknik analisis data dimulai dari analisis kebutuhan, perancangan, pengembangan, uji coba dan evaluasi. Hasil validasi data, tes dan instrumen penilaian di analisis secara bertahap hingga produk dinyatakan valid, praktis dan efektif. Hasilnya, nilai ahli teknologi sebesar 92,13, ahli model pembelajaran sebesar 91,43, penilaian teman sejawat sebesar 94,02, dan seluruh penilaian yang diberikan diinterpretasi dengan sangat baik. Pada uji coba kecil rata-rata hasil post-test sebesar 88,40. Skor rata-rata untuk uji coba kelompok besar adalah 90,83. Selisih skor mahasiswa yang menggunakan model dan yang tidak menggunakan model sebesar 18,63. Kesimpulan, produk yang dikembangkan mampu meningkatkan pemahaman dan hasil belajar mahasiswa meningkat secara signifikan pada mata kuliah.

ABSTRACT

The decline in student understanding and learning outcomes in courses is caused by the learning model and media as tools used in delivering the material are less than optimal. The gap between theory, expectations, and reality in the field makes this research urgent to be researched to improve student understanding and learning outcomes in courses using cooperative learning models with the help of a Learning Management System (LMS). The research method used is Research and development (R&D) with the ADDIE method. The research subjects were 40 students. The product developed is a cooperative learning model. Data collection techniques using product validation, instruments, pre-test, and post-test. Data analysis techniques start from needs analysis, design, development, testing, and evaluation. The results of data validation, tests, and assessment instruments are analyzed in stages until the product is declared valid, practical, and effective. As a result, the technology expert's score was 92.13, the learning model expert's score was 91.43, the peer assessment was 94.02, and all the assessments given were interpreted very well. In small trials, the average post-test result was 88.40. The average score for the large-group trial was 90.83. The difference in scores between students who used the model and those who did not use the model was 18.63. In conclusion, the product developed can increase understanding and student learning outcomes increase significantly in courses.

1. INTRODUCTION

Current higher education cannot be separated from the role and assistance of technology in carrying out learning for students (Afandi, 2022; Sailer et al., 2021). Technology is a tool and means of communication between lecturers and students in the learning process and lecturers can convey all lecture administration with the help of technology (Haleem et al., 2022; Tuma, 2021). However, quite a few problems were encountered by lecturers and students when the implementation was carried out. Obstacles and difficulties arise when the learning process is carried out, starting from the internet which is often disconnected, media learning devices which are often difficult to operate and often disrupted, and the media aids used cannot support the learning model used to the limited ability of students and lecturers themselves in using technology. Education currently uses a lot of media such as Zoom, Teams, and Google Meet as tools that are most easily accepted by students at school. However, in higher education, the tool used by lecturers and students in implementing learning is the Learning Management System (LMS) (Estrella, 2022; Zen, Reflianto, Syamsuar, & Ariani, 2022; and Fujs, Vrhovec, Žvanut, & Vavpotič, 2022). In higher education, there is a lot of preparation for administration and reporting of tasks given by lecturers. This requires media as a tool that can store all learning information starting from learning implementation plans, materials, assessments, assessment rubrics, videos, and student assignments which must be stored properly by students and lecturers (Al-Amin, Zubayer, Deb, & Hasan, 2021; Bauman & Lucy, 2021; Lapitan, Tiangco, Sumalinog, Sabarillo, & Diaz, 2021).

In higher education today many use the media learning management system (LMS) (Le et al., 2022; Stecuła & Wolniak, 2022). Every university uses a Learning Management System (LMS) with the hope of improving the learning process and improving student learning outcomes in the subjects taught. However, the facts differ between theory and reality, the facts show that in 2022 the learning process in higher education will experience a decline in understanding of subjects, from the survey there was a decrease in learning outcomes of 36% and 67% reported difficulties in using the Learning Management System (LMS). Meanwhile, lecturers think that using a learning management system (LMS) requires quite a long process because every course taught must have material prepared in advance and complete with assessments and evaluation sheets (Espinosa-Navarro et al., 2021; Saide & Sheng, 2021; Thoms & Eryilmaz, 2014). Another fact, in 2023, was found in a survey of students who used the Learning Management System tools that were still far from expectations. There are 62% of students think they still have difficulties in the learning process using the Learning Management System. Students said that apart from difficulties in communicating, students also experienced difficulties in saving assignments and accessing material provided by lecturers (Gopinathan et al., 2022; Smirani et al., 2022). Lecturers also have opinions and experience problems in preparing appropriate materials and models in implementing courses with the help of the Learning Management System (Al-Mamary, 2022; Sulaiman et al., 2022). Lecturers and students have the same opinions and views and are in line, with using the learning management system (LMS) there are quite serious problems and require appropriate learning models in implementing course learning with the help of the Learning Management System.

When analyzing research needs, ask lecturers about problems that are often encountered. The lecturer in the Education Management course answered that the use of a learning management system (LMS) requires an appropriate learning model, such as a model that fits into a module or includes it in teaching materials, assessment in line with the learning model used complete rubrics and according to the model, division of tasks according to the learning model (Ivanović et al., 2013; Kibirige & Teffo, 2014). As a result, students are not optimal in the learning process and learning outcomes tend to decrease. Lecturers are aware of this problem, but due to time constraints, they continue to combine online and face-to-face learning methods, to ensure that the learning process continues as usual. Lecturers realize that this cannot continue like this, there must be a solution that can develop learning models with the help of learning tools through learning management systems (LMS) in courses.

When students were asked about the obstacles and difficulties they faced, the difficulty of accessing the Learning Management System (LMS) course material and the difficulty in following the learning model used by lecturers in teaching. The learning process using a learning management system (LMS) is still far from what students expect. Students expect the need to develop learning models by incorporating them into the material and using Learning Management System (LMS) learning process tools, starting from course learning plans, learning models in the material, assignments or projects that students must complete, quizzes in the form of appropriate models, rubrics (Alenezi, 2020; Dudek & Heiser, 2017). The learning model used so far in this course is the cooperative learning model. This model is used during the face-to-face learning process, students form discussion groups to produce solutions to each existing problem from each material. However, during the online learning process, group discussions decreased and students' interest in learning decreased. The cooperative learning model is a model that combines all the

understanding involved in the discussion. It is hoped that this model can be developed in the Learning Management System (LMS) used (Al-Rahmi & Zeki, 2017; Pareto & Willermark, 2022).

Development theory states that to achieve student success in achieving maximum learning outcomes and according to expectations, it is necessary to develop appropriate learning models with the help of tools in the form of media as a means of percentages and discussions between students and lecturers (Astadi et al., 2022; Degner et al., 2022). According to other study in producing a learning model that is appropriate and meets user expectations and can be used in mass learning, development, validation, and testing procedures must be followed on students as users (D'amore et al., 2022). In development research theory, it is best used to produce an appropriate learning model with the steps carried out with the ADDIE development model, namely Analysis, Design, Development, Implementation, and Evaluation. According to previous study this development theory can solve all student problems and provide solutions for improving expected learning outcomes through learning model products used to help students (Caporarello & Sarchioni, 2014). The model developed is the Cooperative Learning Model. The Cooperative Model is outlined in the material, discussion questions, and questions used as discussion material between students and lecturers with the help of the Learning Management System (LMS) (Anokhin et al., 2022; Ferdianto & Dwiniasih, 2019).

This is urgent because there are differences between theory, expectations, and reality on the ground. The theory says that using the right learning model and the help of a Learning Management System (LMS) can improve student learning outcomes, with the hope that lecturers find the right learning model. However, the fact is that student learning outcomes tend to decline and the level of understanding in courses is getting lower. This creates a gap between theory, expectations, and reality in the field, and is very urgent to research to improve student understanding and learning outcomes in courses using the cooperative learning model with the help of the Learning Management System (LMS) and finding out the effectiveness of the cooperative learning model with the help of Learning Management System (LMS) in courses is become the novelty of this study. The purpose of this study is to analyze the improvement of students' understanding and learning outcomes in courses with a cooperative learning model with the help of a Learning Management System (LMS).

2. METHOD

The method in this research is Research and Development (R&D) ADDIE type, namely Analysis, Design, Development, Implementation, and Evaluation (Johnson et al., 2022; Yu et al., 2022). The development research flow used is show in Figure 1.

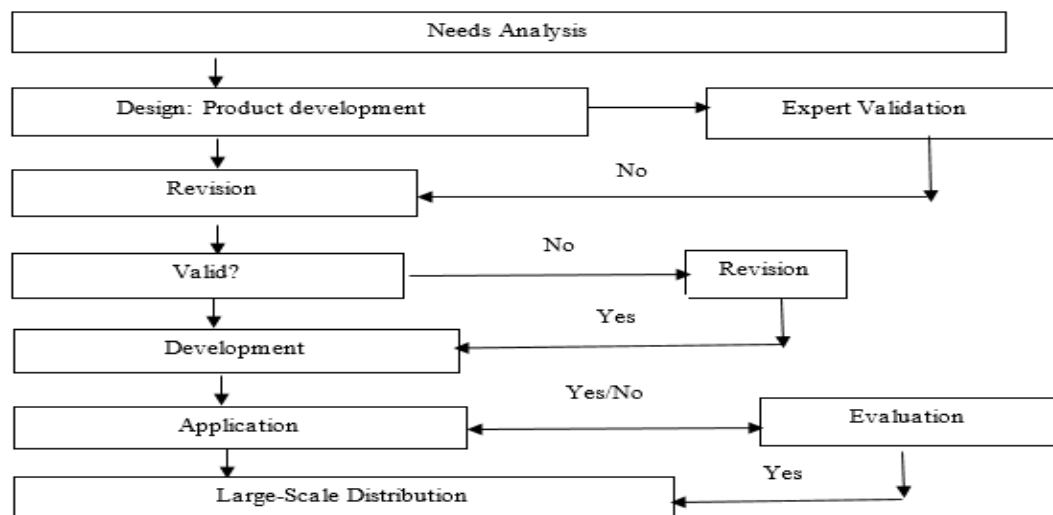


Figure 1. Research Flow

The first stage is to analyze the needs of lecturers and students. The research asked questions to lecturers about the obstacles they faced when preparing learning tools and what difficulties they faced when implementing the courses they taught. In analyzing these needs, everything is recorded and becomes the basis for designing the product being made (Lumbantoruan & Manalu, 2024; Lumbantoruan & Ditasona, 2024). The second stage is product design. At this design stage, the researcher designs the material by

pouring the cooperative model into the lecture materials that have been created. Third stage Development. At this development stage, the research provides a cooperative learning model that has been outlined in the material that has been prepared for validation, namely experts and colleagues. The experts in question are experts in the field of technology and learning model experts. Meanwhile, the lecturers selected are lecturers in the same field who teach the course. The fourth stage is Implementation. At this stage, the research carried out two stages of trials, namely small-scale trials and large-scale trials. At this stage, a pre-test and post-test are also carried out. The final stage is Evaluation. In this final stage, the research evaluates the product models that have been tested. At this stage, an assessment is also carried out by looking at the average increase in the post-test. The post-test results are the basis for concluding whether the cooperative learning model is practical and effective. The subjects in this research were 40 students.

The data collection technique is by providing material that has been outlined in the cooperative learning model to validate for assessment. The instrument is given as a measuring tool for assessing whether this model product is valid or still needs to be revised. The instrument was developed from indicators for developing learning models. The instrument is given on a Likert scale, namely scale 1 to scale 5. Data was collected from validation by learning model experts, peers, and students. The assessment results are collected and become the basis for improving learning models and become the basis for determining the practicality of learning in courses with a Learning Management System (LMS) equipped with a cooperative model (Doi et al., 2022). Data on student learning outcomes is also collected from pre-test and post-test results. The pre-test and post-test results are the basis for determining the effectiveness of the cooperative learning model with Learning Management System (LMS) tools. The research indicators is show in Table 1.

Table 1. Research Indicators

No	Indicator	Number of Items
1	Learning Components	8
2	Presentation	7
3	Suitability of Materials and Media	9
4	Written Language Design	12
5	Suitability of learning model	12
6	Model construction in matter	12
Total		60

Analysis technique, analysis is carried out on E-learning products and models by analyzing the assessments given by experts, colleagues and students. Each assessment component is summed up and the final average is seen. The assessment given is made in the form of tables and diagrams and forms the basis for interpreting the results. Furthermore, the research evaluated E-learning and the cooperative model based on the results of technology validation, learning model experts, administrative management lecturers and students in small group trials. Data were analyzed using a Likert scale calculation with points 1 to 5. The percentage of success used is the calculation (Dana et al., 2022; Tosuntaş et al., 2015).

3. RESULT AND DISCUSSION

Result

Stages of student needs analysis and lecturer needs analysis. Analysis of student needs is carried out by distributing questionnaires regarding obstacles and difficulties in preparing learning, subjects, methods, models, strategies, and media tools used as well as student learning outcomes in subjects deemed to have obstacles. Students were asked about obstacles and difficulties in the course, this is because this course requires appropriate learning models and media to convey the content of the material. The students think that the courses given are not just theory but include direct practice with the help of learning models that can support the courses. When learning online, management course practice is reduced. Students hope that there will be a development of cooperative learning models with the help of the Learning Management System (LMS) media during courses. When online learning is implemented, students' understanding and learning outcomes decrease because the learning model used so far is not appropriate in the Learning Management System (LMS). The second stage is an analysis of the needs of educational management lecturers. When this research asked about the constraints and difficulties of lecturers in preparing and implementing educational management courses, the lecturers answered that they had obstacles in using E-Learning and that the model used was not appropriate. Lecturers hope that the cooperative model that has been used can be developed in the Learning Management System (LMS) that is used during the learning process so far. In online learning, lecturers and students have used the Learning Management System (LMS)

media. The lecturer hopes that this research can develop a model for the Learning Management System (LMS). Lecturers also admit that students' low understanding of courses makes lectures less optimal and satisfactory for students in learning. This research provides a pre-test for students to see students' initial abilities. The results obtained were for class A with a pre-test score of 44.22 and class B pre-test of 36.33.

Lecture materials which are prepared and designed using a cooperative learning model and assisted by media are included in the Learning Management System (LMS) which is a tool to help implement courses taught by the lecturers. Everything related to the courses taught by the lecturer is entered into the Learning Management System (LMS), starting from the learning implementation plan, the cooperative model included in the material, assessment methods, assessment rubrics, and assignments formed by the cooperative model. This research includes the implementation plan learning, materials, cooperative assignments, project assignments in the form of cooperative models, assessment rubrics, and assessments for each group. Everything is included in the Learning Management System (LMS). In designing the model, this research took into account the expectations of students and lecturers when conducting a needs analysis. Everything related to assignments and course material is directed using a cooperative model by forming discussion groups for each material and question groups for each material. Material designed using a cooperative model is arranged in a Learning Management System (LMS) and lecturers form student groups at each meeting.

In the initial stages of developing a cooperative model with the help of this learning management system, researchers provide products to be assessed by technology experts. The validation process lasts 2 months until technology experts think the product is worthy of being tested by other experts. Figure 2 show the visualization of cooperative model product outlined in the learning management system as assessed by technology experts and learning model experts.



Figure 2. Discussion Among Students

In their assessment, technology and learning model experts gave a mean rating of above 90. This value can be interpreted to mean that the cooperative learning model developed in the learning management system is in the very good category. During product validation, experts provided assessments 4 times and suggested many changes from the previous design. Technology and learning model experts provide suggestions for saving assignments and projects for students to work on with the aim that students will not have difficulty finding assignment information for the next meeting. The experts assessed the learning components in the media at 93.12, the media construction at 92.03, the model used in technology at 91.30, and the way of presenting it at 92.10. The second stage, research provides products for validation by learning model experts. The learning expert provided suggestions 5 times in 2 months; the learning model expert provided a very good response to the model outlined in the learning management system being developed. The learning model expert assessed the suitability of the material indicators as 91.12, written language design as 92.50, the suitability of the model as 91.33, and model construction as 90.80. Of all assessment components, learning model experts can be interpreted as providing an assessment of all components very well. Based on this assessment, the research continued validation with colleagues, namely lecturers who taught the Education Management course. In the third stage, this research continues validation by providing the product to colleagues to evaluate products that have been developed and

validated by technology experts and learning model experts. It was found that colleagues also gave very good assessments of all product components that had been developed in this research. Colleagues gave the written language component a score of 94.20, material suitability 93.30, written language design 95.20, model suitability 93.08, and construction 94.20. All assessment components given by colleagues become the final stage of assessment before implementation is carried out and tested on students.

In this implementation phase, the research conducted trials by providing products to students in the learning process. Materials, models, assignments, projects, assessment rubrics and assessments have been prepared in the learning management system (LMS) media. Before the learning process is carried out, the research gives instructions to students to see and access the products that have been developed. The research went on actively for one month and I found no problems with the learning process taking place. At the end of the learning process, the research gives post-tests to students to see the improvements they can get with the help of the products that have been developed. The results obtained by small group students during the trial are as show in Table 2.

Table 2. Peer Validation Assessment

No	Indicator	Presentation	Category
1	Learning Component	96.30	Very good
2	Presentation	94.20	Very good
3	Material Suitability	91.25	Very good
4	Writing Language Design	93.40	Very good
5	Model Fit	92.18	Very good
6	Construction	92.22	Very good
	Mean	93.25	Very good

Table 2 shows student assessments of products that have been designed, validated and tested. Students' assessment of the learning component indicators was 96.30, the way of presenting received a score of 94.20, the suitability of the material was 91.25, the design of the writing language was 93.40, the suitability of the model was 92.18, and the construction was 92.22. All indicators assessed by these students are interpreted in the very good category.

In this large group trial phase, students are given learning with the help of products that have been designed, validated and have been tested on a small scale to students. Before the learning process is given, pre-tests are given to all students who are the object of research. Then proceed with the implementation of the course with the help of existing products. During the learning process for this education management course, it lasted for 4 months and during this time materials, models, and other equipment were recorded and corrected in the online media used. In the final stage of learning this course, this research provides post-tests to measure results and sorry for giving products as learning aids. The results obtained by students are show in Figure 3.

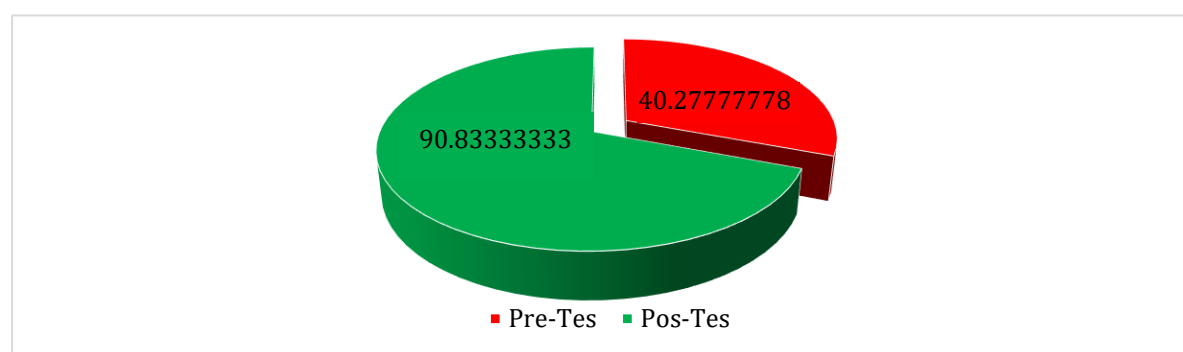


Figure 3. Comparison Before and After the Learning Process with the Help of Products

Base on Figure 3 show result of product trial, research also teaches different classes without the help of products that have been developed. Models and media that have been developed are not used in the learning process in different classes. The results obtained are very different. In the class that did not use the product, the average score at the post-test was 72.20. Research interprets the results obtained in the good category. The difference in the average value of those who do not use the product with those who use the product is 18.63. Recapitulation of student assessment of products is show in Table 3.

Table 3. Recapitulation of Student Assessment of Products

No	Indicator	Percentage	Category
1	E-Learning Components	93.80	Very good
2	Model Fit	94.13	Very good
3	Presentation	97.68	Very good
4	Material writing language	96.78	Very good
Mean		91.98	Very good

Base on [Table 3](#), the assessment given by students in the learning process with the help of products is very good. This can be seen from all the components of the assessment indicators given to students who scored nineties, for the learning management system component 93.80, suitability, model 94.13, presentation 97.68, material writing language 96.78. This has a positive value for answering problems in the background and being a solution to previous problems in the educator management course. The product developed in this research is in line with the theory that a product that gets a very good value must be able to increase the interest of its users.

Discussion

Discussion regarding the effectiveness of cooperative learning models with the help of a Learning Management System (LMS) in improving student learning outcomes is an important topic in the world of education. This research involved 40 students as research subjects and produced a product that was considered valid, practical, and effective. The research results showed a significant increase in student understanding and learning outcomes. In this discussion, there will be further discussion regarding the concept of cooperative learning models, the role of the Learning Management System, the research methods used, research results, and the implications of the findings of this research. The cooperative learning model is a learning approach that emphasizes cooperation between students in achieving learning goals ([Laukkanen & Tura, 2022](#); [Al-Emran et al., 2022](#); and [Liu et al., 2022](#)). This model allows students to work together, share knowledge, and solve problems together. In the context of this research, the cooperative learning model is used as a basis for developing effective learning strategies. With collaboration between students, it is hoped that understanding and learning outcomes can increase significantly. Apart from that, the Learning Management System (LMS) also plays an important role in supporting the implementation of the cooperative learning model.

LMS is a digital platform that allows management of learning materials, interaction between lecturers and students, as well as online assessments. With an LMS, the learning process can be more structured, efficient, and easily accessible to students. In this research, LMS is used as a tool to present learning material and facilitate interaction between lecturers and students. This method involves the stages of needs analysis, design, development, testing, and evaluation. With this approach, researchers can design and develop learning models that suit student needs and support the learning process effectively ([Palupi & Septiana, 2018](#); [Zharova et al., 2020](#)). The testing and evaluation stages also allow researchers to evaluate the effectiveness of the learning model being developed. Research findings show that the cooperative learning model developed can significantly improve student understanding and learning outcomes. Validation of data, tests, and assessment instruments shows that this learning model is considered valid, practical, and effective by technology experts, learning model experts, and colleagues. The results of the post-test conducted on students who used the learning model also showed a significant improvement compared to those who did not use the model ([Jaakkola et al., 2022](#)).

Forming a valid cooperative model in a Learning Management System (LMS) is a discovery in higher education. Materials, learning plans, methods, models, learning strategies, assignments, projects, assessment rubrics, and previously designed assessments are included in the learning management system. This product is equipped with a cooperative model that divides projects and assignments into several groups and is given to students to discuss each material in the educator management course. This product has been rated by experts as providing an excellent rating. The effectiveness and practicality of the product can be seen from the learning process and learning outcomes obtained by students during the post-test. Practicality is assessed by students when given research instruments to be assessed by students. With this excellent value, it can be said that products combined with a cooperative model can improve the learning outcomes of education management students ([Hamadi et al., 2021](#); [Ridwan et al., 2022](#)).

This is in line with the theory, that every product must be said to be valid and tested in its use and declared effective ([Zhou et al., 2020](#); [Arpaci et al., 2020](#); [Cheah et al., 2020](#)). Increased understanding and improved learning outcomes in Educational Management and Psychology Orientation courses. In large-

scale trials, this research also carried out learning in different classes without providing the product that had been developed. The results obtained from the post-test were 72.22. However, students who carried out the learning process in educational management courses with the help of E-Learning products and cooperative models obtained very good and high scores, namely 90.83. Students rated the learning process, products, and models through instruments at 91.98. This confirms that the course learning process is very good and runs smoothly. This finding is in line with previous research which states that developing cooperative learning models and online media assistance can improve student understanding and learning outcomes (Hamadi et al., 2022; Hamadi et al., 2021; Ridwan et al., 2022).

The implications of research regarding the effectiveness of cooperative learning models with the help of a Learning Management System (LMS) in improving student learning outcomes have a significant impact on the world of education. The following are several important implications of the findings of this research: First, this research contributes to the development of innovative and effective learning strategies. Second, the findings of this research also encourage educational institutions to make more use of technology in the learning process. Using LMS as a tool in presenting learning material and facilitating interaction between lecturers and students can increase learning efficiency and effectiveness. Finally, the implications of this research can also inspire other educational institutions to adopt cooperative learning models with the help of LMS to improve student learning outcomes. By paying attention to the findings of this research, educational institutions can identify the potential and benefits of implementing this learning model in their learning context. Overall, this research makes a valuable contribution to efforts to improve the quality of education through the development of innovative and effective learning models. The implications of this research finding can bring positive changes in learning practices in educational institutions and provide direction for better educational development in the future.

In the context of research regarding the effectiveness of cooperative learning models with the help of a Learning Management System (LMS) in improving student learning outcomes, several limitations need to be considered. The following are several limitations that can be identified from this research: First, one of the main limitations of this research is the limited focus on one particular course or subject. This research only uses the cooperative learning model as the main focus without considering a variety of other learning models that may also be effective. This can limit understanding of the comparative effectiveness of different learning models in the same context. Therefore, future research should consider variations in learning models to enrich research findings. Apart from that, another limitation that needs to be considered is the lack of in-depth understanding of the contextual factors that can influence the implementation of this learning model. This research has not specifically identified and analyzed contextual factors, such as student characteristics, institutional support, and learning environment conditions, which can influence the successful implementation of this learning model.

4. CONCLUSION

This research concludes that the validation of data, tests, and assessment instruments shows that the learning model developed received very good assessments from technology experts, learning model experts, and assessments from peers. The average scores from small trials and large groups also show significant improvements in student understanding and learning outcomes. The difference in scores between students who use the cooperative learning model with LMS and those who do not use this model is also quite large, indicating the positive impact of using this model. Thus, this research makes a valuable contribution to the field of education by showing that the cooperative learning model with an LMS can be one solution for improving student learning outcomes. It is hoped that the results of this research can become a reference for educational institutions in developing innovative and effective learning methods to improve the overall quality of education.

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