



## The Development of Teaching Material for Blended Learning: A Strategy to Improve Students' Creativity and Innovation in the 21<sup>st</sup> Century

**Pattaufi, Dedy Aswan, Abdul Hakim**

<sup>1</sup>Educational Technology, Universitas Negeri Makassar, Indonesia

Email: [pattaufi@unm.ac.id](mailto:pattaufi@unm.ac.id)

<sup>2</sup> <sup>1</sup>Educational Technology, Universitas Negeri Makassar, Indonesia

Email: [dedyaswan@unm.ac.id](mailto:dedyaswan@unm.ac.id)

<sup>3</sup> <sup>1</sup>Educational Technology, Universitas Negeri Makassar, Indonesia

Email: [abdulhakim@unm.ac.id](mailto:abdulhakim@unm.ac.id)

(Received: 15-12-2022; Reviewed: 20-01-2023; Accepted: 26-03-2023;

Available online: 16-04-2023; Published: 18-04-2023)



This is an open access article distributed under the Creative Commons Attribution License CC-BY-NC-4.0 ©2023 by author (<https://creativecommons.org/licenses/by-nc/4.0/>).

**Abstract.** The study aims to develop a blended learning design to optimize the Microteaching subject in the Educational Technology program. The development method implemented here was the Integrative Learning Design Framework (ILDF), which consists of three stages: exploration, formulation, and evaluation. We used the PEDATI model to design synchronous and asynchronous learning activities in the formulation process. The research outcome is a prototype of blended learning material for microteaching subjects integrating face-to-face and online learning. Validation by an expert in media, learning design, and material shows that it is in a good category. Besides that, the N-gain score of 0.7 indicated that the 21<sup>st</sup>-century skills students must possess include teaching creativity that can be learned through blended learning. A proper learning model supports an effective and efficient learning process. The research findings can be used to design blended learning design in the future to create a more innovative and interactive learning process.

**Keywords:** PEDATI, ILDF, Blended Learning, Micro Teaching, 21<sup>st</sup>-century skills

### INTRODUCTION

The industrial revolution has influenced various life sectors, including how humans work and learn (Ahmad, 2020). Rapid development has affected industries and human lives. Klaus Schwab in Krueger stated that the industrial revolution does not change what we do but changes us (Krueger, 2018).

In the digital technology era, education should utilize technology and renew the learning model to improve the quality of the learning process and prepare students to face the 21<sup>st</sup>-

century era. In the digital era, blended learning solves problems commonly found in traditional learning systems by utilizing information and communication technology (Szadziewska & Kujawski, 2017).

Blended learning is a learning approach that combines technology and traditional learning to provide a better and more effective learning experience. This model enforces learning by giving flexibility and accessibility to students (Arriany & Aswan, 2022). 21<sup>st</sup>-century skills like collaboration, creativity, communication,

and problem-solving are necessary for students to face future challenges (Piiro, 2011). A learning model using technology helps students to develop 21<sup>st</sup>-century skills because it allows them to collaborate and coordinate with their classmates and teachers (Koh et al., 2015). Blended Learning allows students to access online learning material anywhere and anytime. Thus, it could ease the learning activities. Learning material is a reference for students to understand the concept better. It is necessary to use technology in studying, like through a blended learning method, so that students can learn problem-solving and be more creative. They can also practice their communication skills through online discussions and presentations.

Teaching material is an important aspect of the learning process, especially in blended learning, because students can use it independently (Zheng et al., 2021). Mulyasa (Mulyasa, 2021) stated that teaching resource refers to all instrument that contains a message (general or specific) that can be used for learning. Besides, blended learning uses a mixed teaching model consisting of face-to-face learning through computers presented synchronously to fulfill students' educational needs. In technology-based learning, under teacher or lecturer supervision, students can manage their time, place, and material for learning independently through an integrated learning approach (National Education Association, 2011).

The State University of Makassar, as one of the best educational institutions in Eastern Indonesia, has taken some steps to face challenges in the Industrial Revolution era 4.0. For example, it develops a subject: *Introducing Big Data and Coding*. Besides that, the university is developing the lectures with a blended learning model to prepare the graduates to compete in the industrial revolution era of 4.0 (Larasati, 2019).

Besides, online learning is believed to improve student's learning outcomes (Aswan, 2018). Another study also found that online learning effectively increases students' learning results (Taskiran, 2021). The development of blended learning has been extensively carried out, and many of the products are feasible to be implemented in learning (Siregar & Aswan, 2019).

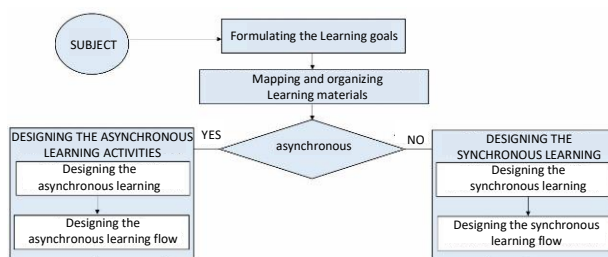
Gleason (2018) argued that each lesson plan in a university should be developed to prepare students to face the 4.0 industrial revolution era. Thus, *hybrid online and in-person instruction*, video conferences, and other

asynchronous media should be prioritized. Those facilities allow students to study anywhere and anytime using LMS and other platforms suited to their levels. Mutiara (Mutiara et al., 2007) divided the learning materials into two categories, printed and non-printed. The printed materials can be module worksheets, while the nonprinted materials are audio, video, and computer. Audio material includes audio cassettes and video cassettes. Then, the video can be video cassette, CD room, and television program. While computerized materials can be presented asynchronously like interactive computerized material. While the asynchronous material utilizes the internet. Therefore, it is important to design the learning material precisely. Learning materials have an important role in this situation.

The material for blended material is highly necessary for the university for the 4.0 revolution era (Asril & Hanafi, 2022; Mulyati et al., 2020). The learning process should leave conventional learning. Another study by the Faculty of Educational Science at the State University of Makassar also showed that the faculty needs blended learning material (Aswan, 2022). The material should facilitate students with the need of the 21<sup>st</sup> century (Amin et al., 2022). Therefore, we believe it is important to develop blended learning material for the Faculty of Educational Science at the State University of Makassar to facilitate students with the 21<sup>st</sup>-century skills to face the 4.0 industrial revolution. Consequently, the university can produce human resources that compete locally and globally.

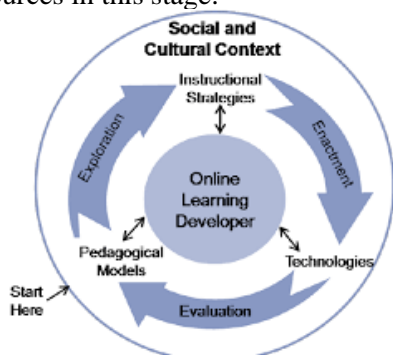
## METHOD

The study employed the research and development method to create a product. The model developed for the Blended Learning material was PEDATI and *Integrative Learning Design Framework (ILDF)*. PEDATI was initially designed especially for blended learning in the university (Chaeruman, 2017). Besides that, the model is recommended by Direktorat Pembelajaran Kementerian Riset, Teknologi dan Perguruan Tinggi. As a model for a learning system, PEDATI illustrated a systematical and logical working procedure consisting of clear and connected components. PEDATI can be used as a guide in designing a blended learning system.



**Figure 1. PEDATI Model**

On the other hand, the *Integrative Learning Design Framework (ILDF)* model was used to develop online and face-to-face learning media (Gustafson & Branch, 2002). The ILDF model was used to develop the learning object or resources in this stage.



**Figure 2. ILDF Model**

a. Evaluation Stage

After developing the learning material, we measured the product's effectiveness (Suparman, 2014) by testing its performance on students.

The media was evaluated through expert judgment. Some experts were invited to assess the media based on the criteria developed by Sudjana (Sudjana, 2002a). The average score from each assessor was interpreted based on the following criteria:

3,26 – 4,00	=	very good
2,50 – 3,25	=	good
1,76 – 2,49	=	rather poor
1 – 1,75	=	poor

Then, we carried out an N gain test on the data from the test used to measure students' ability after studying the material (Chism et al., 1995; Sudjana, 2002). The test was to know if the learning material was effective.

**RESULTS AND DISCUSSION**

**Results**

The blended learning model was developed due to the gap presented in the previous part. The model was expected to solve the problem.

Exploration Stage

a. Need Analysis

In the need analysis step, questionnaires were distributed to students to identify problems they face and their needs in learning. Data from the questionnaires indicated that students complained about the duration of the learning was too short. Moreover, Makassar had a high traffic intensity causing them to spend longer on the way than in the classroom. They felt that collaborative learning or teacher talk was not effective. Then, the less optimal use of learning media reduces the effectiveness of the class.

Based on our analysis, the solution to the problems of the Microteaching subject is developing a blended learning model to allow the class to be conducted online and offline. The facilities for blended learning were also available in the faculty, which can support the development of e-learning in the Educational Technology program.

Based on the observation, the faculty has a web learning system (<https://syam-ok.unm.ac.id/>) that can be used for blended learning. The availability of facilities is important in supporting learning (Junaidi & Subagya, 2014)

b. Analysis of Students' Characteristics

The step collected data about the profiles of students who followed the Microteaching subject. Here, we distributed a questionnaire online using Google Forms to students of Education Technology (batch 2019) who programmed the subject. The questionnaire contains questions developed from the indicators analyzing the students. Students of the Educational Technology program were aged from 16-18 years old and considered mature to have the ability to independently learning (Islam, 2010)

1. Developing Stage

The following stage is to develop the blended learning material for the Micro Teaching subject. In this step, the information obtained from the previous stage (exploration) was used as the guideline to develop the product to align with the real condition in the field. The details of the stages are as follows:

a) Learning Design

In this step, we used the PEDATI model to design the blended learning involving the following procedures:

1) Formulating the Learning Goals

Here, we developed the learning goals based on the results of discussions with lecturers teaching Microteaching subjects.

2) Mapping and Organizing the Learning Materials

Then we mapped and organized the learning materials based on the learning goals formulated in the previous step. This stage produced a lesson plan for the Microteaching subject containing material, strategies, media, and evaluation.

3) Selecting and Determining the Synchronous and Asynchronous Learning Activities

We identified materials mapped and organized to identify whether they needed practice or concept.

4) Designing Asynchronous Learning Activities

Then, we designed the asynchronous learning using proper media and sources based on the learning material that had been determined.

2. Evaluation Step

The blended learning design for the microteaching subject that had been developed was evaluated in this step. The evaluation was through expert judgment involving material, design, and media experts. They assessed the product using the instrument that we prepared.

Input, suggestions, and comments from the learning design experts related to the Blended Learning material are presented in the following bar chart.

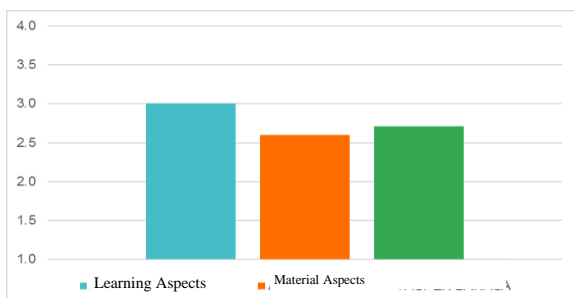


Figure 3. Graph of Recapitulation of Data from Learning Design Expert

After revising based on the input and recommendations from the design experts, we obtained a score of 2.8, categorized as “Good”. The assessor suggested improving the mapping concept and learning guide.

The following is the recapitulation of the assessment from the expert on learning media, which consists of the learning aspect, software, hardware, and material and media presentation.

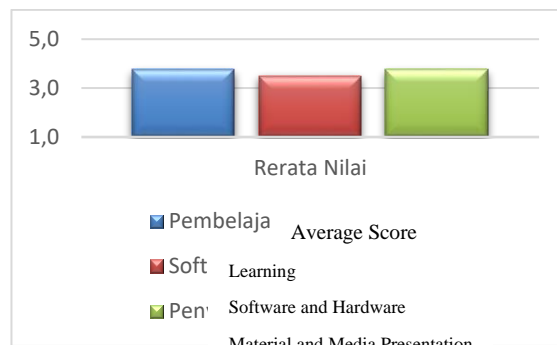


Figure 4. Graph of Score Recapitulation from Media Experts

After revising the material based on the input and recommendation from the media expert, we obtained a score of 3.7 (very good). The experts stated that the media is dominated by video, and it is better to put more videos showing the lecturer.

The following graph is the recapitulation of the assessment from the expert on learning material, which consists of learning, material and language.

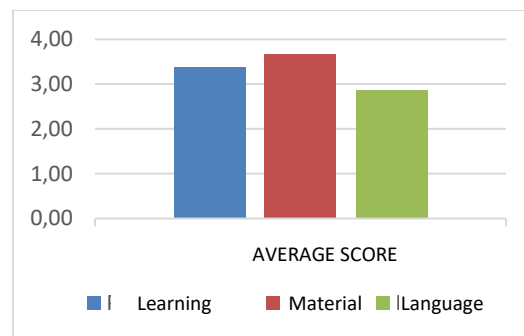


Figure 5. Graph of Score Recapitulation from Material Experts

After revising the material based on the input and recommendation from the material expert, we obtained a score of 3.3 (Very Good). The judge mentioned that some unnecessary materials should be removed.

Then, we tried the product on three students of the Educational Technology program batch 2019 who took the Microteaching course. The scores of the one-to-one trial are in the table 1.

Table 1. trial score

No.	Names	Average Score
1	Student 001	2,86
2	Student 002	3,00
3	Student 003	3,04
	Mean Score	2,96

Based on the data above, the product is in a Good category with an average score of 2.96. Some spelling on the learning material needs to be corrected to make the learning more interactive.

The last evaluation was conducted through a Small Group test involving 13 students. The data show that the product was in the "Very Good" category with an average score of 3.42.

We then conducted an N-gain test to measure how far the blended learning material can improve students' learning results. The aspect assessed here is the 21<sup>st</sup>-century skill which is creativity. In this case, we measured the students' creativity to design and practice Microteaching. The results are presented in the following table 2.

**Table 2.** The Improvement of the Creativity

Pretest	Posttest	N-Gain	Criteria
72	92	0,7	High

Based on the table above, students' creativity in microteaching improved. The data shows a significant increase in students' creativity after using the material. Besides that, the average score of 92 is far higher than the standard minimum criteria. Then, the N-Gain score is high.

## Discussion

After analyzing the feasibilities of the learning material, including the content, learning design, and media referring to the BNSP standard (content, presentation, and graphic / design) (Kantun & Budiawati, 2015), we did review and trials to get input from the experts and users (Wulandari & Purwanto, 2017). Data presented in the previous part shows that the media is very good. Then, the trial/review by students (one of the one and small-group tests) also showed that the product was good and very good, respectively. Thus, the blended learning media developed in this study is feasible for teaching.

Material evaluation is the step to validate the material's content (Salkind, 2010). Materials prepared for blended learning need further evaluation before implementation (Rowntree, 1994). The material should be considered feasible before being taught.

A review by the learning design expert aims to assess if the learning stages and goals match the material. (Roblyer, 2016). The process also allows the developers to get a suggestion for improving the project. A good instructional

design will influence teaching effectiveness (Agustini et al., 2017).

The learning media was reviewed to ensure that it fulfills the standard and can help students better understand the material (Rice & Ortiz, 2021). good media should make learning more fun. Thus, it gets more effective (Capuno et al., 2019). The suggestion to add videos in e-learning increased the attraction of the media. The video makes abstract concepts more concrete (Kuncoro & Hidayati, 2021; Ridwan et al., 2020). More real learning makes delivering more effective and efficient so that students understand a difficult concept more easily (He et al., 2012; Tjakrawadhana, 2017). therefore, reviewers play an important role in the development of teaching material.

Review by experts, one-to-one tests, and small group tests can ensure that the material is based on the teaching goals (Dick et al., 2014; Smaldino et al., 2008; Suparman, 2014). The media had been evaluated to endure that the content and the design were aligned with the learning goals (Hannafin & Pech, 1988). Thus, it is feasible to be applied by students.

Table 1 shows the N-gain score of 0.7, categorized as 'high' (Biggs & Tang, 2011). It means that one of the 21<sup>st</sup>-century skills that students must possess, creativity, could be increased by the media developed in this study (Hussin, 2018). Students were more creative in teaching the blended learning material designed based on students' needs (Aswan, 2022; Pattaufi & Aswan, 2022). The findings indicated that the blended learning material effectively improved students' creativity in the microteaching subject.

As the internet aids it, blended learning allows students to study anywhere and anytime (Bouilheres et al., 2020; Siregar & Aswan, 2022). Blended learning was massively applied during Covid 19 pandemic era (Dhawan, 2020; Xie et al., 2020). Thus, after the pandemic, students got accustomed to the model. Students enjoyed the learning process to make it more effective and efficient (N et al., 2021; Pratomo & Wahanisa, 2021).

Blended Learning leads students to learn flexibly and independently but still get guidance and support from the teachers or facilitators online (Horn & Heather, 2013). Consequently, they are better motivated to study (Talakua & Sesca Elly, 2020). Proper technology and a supportive teaching strategy can create a creative and interesting learning environment. It supports students to produce creative ideas to be explored

in learning design and shown through microteaching. Creative teaching skills are important for the teacher candidate's students' future.

## CONCLUSIONS AND SUGGESTION

This developmental study produced blended learning material for the Microteaching subject. It used the ILDF (Integrative Learning Design Framework) model developed by Bannan & Ritland and PEDATI and successfully increased the students' creativity. The next study should use another model more suitable for web development, and the learning material should be completed with the simulation of a new and creative teaching method.

## REFERENCES

- Agustini, K., Saindra S, G., & Sugihartini, N. (2017). Efektivitas Desain Instruksional Berstrategi Blendedlearning Dengan Pendekatan Konstruktivistik. *Seminar Nasional Riset Inovatif*.
- Ahmad, Z. F. S. (2020). Penggunaan Model Pembelajaran Blended Learning Pada Era Revolusi Industri 4.0. *JURNAL SOCIUS*, 9(1), 61–70. <https://doi.org/10.20527/JURNALSOCIUS.V9I1.7600>
- Amin, N. S., Rahmawati, A., Azmin, N., Nasir, M., Keguruan, S. T., & Pendidikan, I. (2022). *Pengembangan Pembelajaran Blended Learning untuk Meningkatkan Keterampilan Abad 21 Siswa SMAN 2 Kota Bima* (Vol. 5). <http://Jiip.stkipyapisdompui.ac.id>
- Arriany, I., & Aswan, D. (2022). Pengembangan Blended Learning Menggunakan Model Flipped Classroom Pada Mata Kuliah Pengantar Manajemen. *Jurnal Ilmiah Wahana Pendidikan*, 8(12), 584–594. <https://doi.org/10.5281/ZENODO.7027543>
- Asril, Z., & Hanafi, A. H. (2022). Constructing of teacher professional and competitiveness for Indonesian education in 4.0 er. *2nd UIN Imam Bonjol International Conference on Islamic Education*, 11(2), 148–156. <https://doi.org/10.32698/ICIE542>
- Aswan, D. (2018, October 25). Pengaruh Pemanfaatan Media E-Learning Quipper School Terhadap Hasil Pada Mata Pelajaran Matematika Siswa Kelas X SMA Negeri 1 Majene. *Prosiding Seminar Nasional Dan Temu Kolegial Ke Iv Asosiasi Program Studi Teknologi Pendidikan Indonesia (APS-TPI) : Innovative Learning in Digital Era, Building 21 St Century Generation*. <https://doi.org/10.5281/ZENODO.2575928>
- Aswan, D. (2022). Analisis Kebutuhan Sumber Belajar LMS Pada Mata Kuliah Micro Teaching. *Indonesian Journal of Learning Education and Counseling*, 5(1), 11–15. <https://doi.org/10.31960/IJOLEC.V5I1.1715>
- Biggs, J., & Tang, C. (2011). *Teaching for Quality Learning at University Fourth Edition The Society for Research into Higher Education* (Vol. 4). [www.openup.co.uk](http://www.openup.co.uk)
- Bouilheres, F., Le, L. T. V. H., McDonald, S., Nkhoma, C., & Jandug-Montera, L. (2020). Defining student learning experience through blended learning. *Education and Information Technologies*, 25(4). <https://doi.org/10.1007/s10639-020-10100-y>
- Capuno, R., Revalde, H., Etcuban, J. O., Aventuna, M., Medio, G., & Demeterio, R. A. (2019). Facilitating Learning Mathematics Through the Use of Instructional Media. *International Electronic Journal of Mathematics Education*, 14(3), 677–688. <https://doi.org/10.29333/IEJME/5785>
- Chaeruman, U. A. (2017). *PEDATI Model Desain Sistem Pembelajaran Blended. Panduan Merancang Mata Kuliah Daring SPADA Indonesia*. Direktorat Pembelajaran, Dirjen Pembelajaran dan Kemahasiswaan, Kemenristekdik.
- Chism, N. V. N., Angelo, T. A., & Cross, K. P. (1995). Classroom Assessment Techniques: A Handbook for College Teachers. *The Journal of Higher Education*, 66(1). <https://doi.org/10.2307/2943957>
- Dhawan, S. (2020). Online Learning: A Panacea in the Time of COVID-19 Crisis. *Journal of*

- Educational Technology Systems*, 49(1), 5–22.  
<https://doi.org/10.1177/0047239520934018>
- Dick, W., Carey, L., & O.Carey, J. (2014). *The Systematic Design of Instruction* (8th ed.). PEARSON.  
<http://ajet.org.au/index.php/AJET/article/view/581>
- Gleason, N. W. (2018). Higher Education in the Era of the Fourth Industrial Revolution. *Higher Education in the Era of the Fourth Industrial Revolution*, 1–229.  
<https://doi.org/10.1007/978-981-13-0194-0>
- Gustafson, K. L., & Branch, R. (2002). *Survey of Instructional Development Models ; Fourth Edition*. ERIC.
- Hannafin, M. J., & Pech, K. L. (1988). *The Design, Development and Evaluation of Instructional Software*. Macmillan Publishing.
- He, Y., Swenson, S., & Lents, N. (2012). Online video tutorials increase learning of difficult concepts in an undergraduate analytical chemistry course. *Journal of Chemical Education*, 89(9), 1128–1132.  
[https://doi.org/10.1021/ED200685P/ASSET/IMAGES/MEDIUM/ED-2011-00685P\\_0004.GIF](https://doi.org/10.1021/ED200685P/ASSET/IMAGES/MEDIUM/ED-2011-00685P_0004.GIF)
- Horn, M., & Heather, S. (2013). Blended: Using disruptive innovation to improve schools. *Journal of Chemical Information and Modeling*, 53(9), 1689–1699.  
<https://doi.org/10.1017/CBO9781107415324.004>
- Hussin, A. (2018). Education 4.0 Made Simple: Ideas for Teaching. *Journal of Education and Literacy Studies*.
- Islam, S. (2010). Kesiapan Belajar Mandiri Mahasiswa Ut Dan Siswa Sma Untuk Belajar Dengan Sistem Pendidikan Tinggi Terbuka Dan Jarak Jauh Di Indonesia. *Jurnal Pendidikan Terbuka Dan Jarak Jauh*, 11(1), 1–14.
- Junaidi, A., & Subagya. (2014). *KESIAPAN SARANA DAN PRASARANA DALAM MENGIMPLEMENTASI PROGRAM STUDI TEKNIK OTOMOTIF JURUSAN TEKNIK KENDARAAN RINGAN ( TKR ) SEKABUPATEN LOMBOK TIMUR TAHUN AJARAN 2013 / 2014 Agus Junaidi \* & Subagya \*\* THE READINESS OF LEARNING FACILITIES IN IMPLEMENTING C. 2(2)*.
- Kantun, S., & Budiawati, Y. S. R. (2015). Analisis Tingkat Kelayakan Bahan Ajar Ekonomi Yang Digunakan oleh Guru di SMA Negeri 4 Jember. *Jurnal Pendidikan Ekonomi*, 9(2), 129–146.
- Koh, J. H. L., Chai, C. S., Benjamin, W., & Hong, H. Y. (2015). Technological Pedagogical Content Knowledge (TPACK) and Design Thinking: A Framework to Support ICT Lesson Design for 21st Century Learning. *Asia-Pacific Education Researcher*, 24(3).  
<https://doi.org/10.1007/s40299-015-0237-2>
- Krueger, K. (2018). Back to the Future: What the Coming Fourth Industrial Revolution Means for Education. *THE Journal : Technological Horizons in Education*, 45(2), 3–5.
- Kuncoro, I. A., & Hidayati, Y. M. (2021). Learning Videos Increase Students' Cognitive Learning Outcomes on Animal Life Cycle Materials. *Jurnal Ilmiah Sekolah Dasar*, 5(2), 299.  
<https://doi.org/10.23887/jisd.v5i2.34107>
- Larasati, C. (2019). *UNJ Mewajibkan Mata Kuliah Big Data dan Coding*. Medcom.Id.
- Mulyasa, E. (2021). *Implementasi Kurikulum 2013 Revisi Dalam Era Industri 4.0*. Remaja Rosdakarya.
- Mulyati, R., Sari, M., & Priatna, N. (2020). *Model-Model Pembelajaran di Era Revolusi Industri 4.0*. 6(1), 107–115.  
<https://doi.org/10.35569>
- Mutiara, Dewi, Zuhairi, Aminuddin, & Kurniati, S. (2007). Designing, Developing, producing and Assuring the Quality of Multi-media Learning Materials for Distance Learners: Lessons Learnt From Indonesia's Universitas Terbuka. *Turkish On-Line Journal of Distence Education-TOJDE*.
- N, Z., Nurmayanti, N., & Ferdiansyah, H. (2021). Efektifitas Media Pembelajaran Daring di

- masa Pandemi Covid-19. *Edumaspul: Jurnal Pendidikan*, 5(1).  
<https://doi.org/10.33487/edumaspul.v5i1.1123>
- National Education Association. (2011). *Blended Learning Policy Brief*.
- Pattaufi, P., & Aswan, D. (2022). Analisis Kebutuhan Sumber Belajar LMS Pada Mata Kuliah Micro Teaching. *Indonesian Journal of Learning Education and Counseling*, 5(1), 11–15.  
<https://doi.org/10.31960/IJOLEC.V5I1.1715>
- Piirto, J. (2011). *Creativity for 21st Century Skills*. Sense Publishers.
- Pratomo, I. W. P., & Wahanisa, R. (2021). Pemanfaatan Teknologi Learning Management System (LMS) di Unnes Masa Pandemi Covid-19. *Seminar Nasional Hukum Universitas Negeri Semarang*, 7(2), 547–560.  
<https://proceeding.unnes.ac.id/index.php/sn/article/view/730>
- Rice, M. F., & Ortiz, K. R. (2021). Evaluating Digital Instructional Materials for K-12 Online and Blended Learning. *TechTrends*, 65(6), 977–992.  
<https://doi.org/10.1007/S11528-021-00671-Z/TABLES/2>
- Ridwan, R. S., Al-Aqsha, I., & Rahmadini, G. (2020). Pemanfaatan Media Pembelajaran Berbasis Video dalam Penyampaian Konten Pembelajaran. *Inovasi Kurikulum*, 18(1), 38–53.  
<https://doi.org/10.17509/jik.v18i1.37653>
- Roblyer, M. D. (2016). *Integrating Educational Technology into Teaching*. PEARSON.
- Rowntree, D. (1994). *Preparing Materials for Open, Distance and Flexibel Learning*. Kogan Page Limited.
- Salkind, N. J. (Ed. ). (2010). *Encyclopedia of research design* (1st ed., Vol. 1). Sage.
- Siregar, E., & Aswan, D. (2019). Development of Blended Learning for Optimization Courses in Education Technology Master Program. *International Conference on Education Technology*, 372, 235–241.
- Siregar, E., & Aswan, D. (2022). Mobile Learning With Case Study Methods For Civic Education In Elementary School. *International Conference on Innovation in Open and Distance Learning*, 3, 1234–1249.  
<https://doi.org/10.5281/zenodo.7596350>
- Smaldino, S. E., Russell, J. D., & Lowther, D. L. (2008). *Instructional Technology and Media for Learning* (Nith Editi). PEARSON.
- Sudjana. (2002a). *Metoda Statistika*. Tarsito.
- Sudjana. (2002b). *Metoda Statistika*. Tarsito.
- Suparman, A. (2014). *Desain Instruksional Modern*. Erlangga.
- Szadziewska, A., & Kujawski, J. (2017). Advantages and Disadvantages of the Blended-Learning Method Used in the Educational Process At the Faculty of Management At the University of Gdansk, in the Opinion of Undergraduate Students. *ICERI2017 Proceedings*, 1(November), 3938–3946.  
<https://doi.org/10.21125/iceri.2017.1051>
- Talakua, C., & Sesca Elly, S. (2020). Pengaruh Penggunaan Media Pembelajaran Biologi Berbasis Mobile Learning terhadap Minat dan Kemampuan Berpikir Kreatif Siswa SMA Kota Masohi. *BIODIK*, 6(1).  
<https://doi.org/10.22437/bio.v6i1.8061>
- Taskiran, A. (2021). *Effective, Efficient, and Attractive Instructional Design for Online Learning*. November, 140–158.  
<https://doi.org/10.4018/978-1-7998-8701-0.ch007>
- Tjakrawadhana, V. R. K. (2017). German Language Learning through Video to Improve Student Motivation and Introduce German Culture. *English Language and Literature* ....  
<https://jurnal.unimus.ac.id/index.php/ELLI/article/view/2493>
- Wulandari, Y., & Purwanto, W. E. (2017). KELAYAKAN ASPEK MATERI DAN MEDIA DALAM PENGEMBANGAN BUKU AJAR SASTRA LAMA. *JURNAL GRAMATIKA*, 3(2), 162–172.



Xie, X., Siau, K., & Nah, F. F. H. (2020). COVID-19 pandemic—online education in the new normal and the next normal. *Journal of Information Technology Case and Application Research*, 22(3), 175–187. <https://doi.org/10.1080/15228053.2020.1824884>

Zheng, W., Ma, Y.-Y., Lin, H.-L., Zheng, W., Ma, Y.-Y., & Lin, H.-L. (2021). Research on Blended Learning in Physical Education During the COVID-19 Pandemic: A Case Study of Chinese Students. *SAGE Open*, 11(4). <https://doi.org/10.1177/21582440211058196>