MJP Journal of Education and Teaching Learning
Vol.4, No.2 (2026): 453 – 459
https://jurnalilmiah.co.id/index.php/MJPJETL



Implementation of Project-Based Learning Model with a Demonstration Approach on the Operational Competence of Mastercam X5 Turning for 11 TPM 5 Students at SMK Canda Bhirawa Pare

[1] Sayyid Nur Rohman , [2] Saifuddin Karim, [3] Marsono

[1,2,3] Mechanical Engineering Education, State University of Malang, Indonesia
***Correspondence Author: saifuddin.karim.ft@um.ac.id**

Article Info

Keywords:

Demonstration; mastercam x5; mixed method; project based learning; turning; vocational school

ABSTRACT

This study aimed to describe the implementation of the Project Based Learning (PjBL) model with a demonstration approach, measure improvements in students' practical performance competence, and explore students' learning experiences in Mastercam X5 Turning learning at a vocational high school. The study employed a mixed method with a Sequential Explanatory design over eight sessions involving 39 students from Grade XI Mechanical Engineering at SMK Canda Bhirawa Kediri and five purposively selected qualitative participants. Quantitative data were analyzed using descriptive statistics, validity and reliability tests, Shapiro-Wilk, Wilcoxon, and N-Gain, while qualitative data were analyzed thematically. The results showed a significant difference between pretest and posttest scores across all topics ($p < 0.001$), with N-Gain in the moderate category (0.4379–0.5302). Qualitative analysis identified five themes: ease of procedural understanding, active observation, demonstration speed as a learning barrier, intrinsic motivation, and transfer to industrial contexts. Triangulation showed that the qualitative findings complemented the quantitative results by explaining students' learning experiences during the learning process. The implementation of PjBL with a demonstration approach was associated with improved students' practical performance competence, with a need to adjust demonstration speed to accommodate differences in students' learning abilities.

Informasi Artikel

Kata Kunci:

Demonstrasi; mastercam x5; mixed method; project based learning; smk; turning

ABSTRAK

Penelitian ini bertujuan mendeskripsikan implementasi model *Project Based Learning* (PjBL) dengan pendekatan demonstrasi, mengukur peningkatan kompetensi unjuk kerja, serta menggali pengalaman belajar siswa pada pembelajaran Mastercam X5 Turning di SMK. Penelitian menggunakan *mixed method* dengan desain *Sequential Explanatory* selama delapan pertemuan di kelas XI Teknik Pemesinan SMK Canda Bhirawa Kediri. Sampel kuantitatif berjumlah 39 siswa dan kualitatif 5 narasumber yang dipilih secara *purposive*. Data kuantitatif dianalisis menggunakan statistik deskriptif, uji validitas, reliabilitas, Shapiro-Wilk, Wilcoxon, dan N-Gain, sedangkan data kualitatif dianalisis secara tematik. Hasil menunjukkan adanya perbedaan signifikan antara pretest dan posttest pada seluruh bab ($p < 0{,}001$), dengan N-Gain berada pada kategori sedang (0,4379–0,5302). Analisis kualitatif menghasilkan lima tema, yaitu kemudahan pemahaman prosedural, observasi aktif, hambatan kecepatan demonstrasi, motivasi intrinsik, dan transfer konteks industri. Triangulasi menunjukkan bahwa temuan kualitatif melengkapi hasil kuantitatif dengan menjelaskan pengalaman belajar siswa selama pembelajaran. Penerapan PjBL dengan pendekatan demonstrasi menunjukkan peningkatan kompetensi unjuk kerja siswa, dengan perlunya penyesuaian kecepatan demonstrasi terhadap keberagaman kemampuan siswa.

Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.
Copyright © 2026 - [1] Nama Penulis Pertama, [2] Nama Penulis Kedua, [3] dst

MJP Journal of Education and Teaching Learning
Vol.4, No.2 (2026): 453 – 459
https://jurnalilmiah.co.id/index.php/MJPJETL



Article History

Received : dd/mm/yyyy
Revised : dd/mm/yyyy
Accepted : dd/mm/yyyy

✉ ***Corresponding Author:*** (1) Name of Corresponding Author, (2) Department of Corresponding Author, (3) Institution of Corresponding Author, (4) Address, City, Postal Code, Country, (5) Email: corresp-author@mail.com

Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.
Copyright © 2026 - [1)] Nama Penulis Pertama, [2)] Nama Penulis Kedua, [3)] dst

1. Intodruction

The development of computer-based manufacturing technology has become a fundamental demand in vocational education, especially in the field of machining engineering. Computer-Aided Manufacturing (CAM) plays an important role in improving design accuracy, speeding up the production process, and reducing manufacturing costs, so mastering CAM software is an essential skill that vocational school graduates need to have before entering the workforce or continuing to conventional machining levels[1]. One of the CAM software programs widely used in the manufacturing industry is Mastercam X5. Mastercam X5 is a CAM software extensively used in manufacturing, especially for programming CNC lathe (turning) machines[2].

Nationally, the link and match policy between vocational schools (SMK) and the business and industrial world (DUDI) has been implemented through various programs like joint curriculum development with industry, internships, and graduate competency certification. However, the unemployment rate among vocational school graduates is still reported to be high, with the main challenges being that the curriculum is not yet adaptive to technological developments in industry and there is limited industry participation in curriculum development at the education unit level [3]. This situation is relevant to the challenges of mastering digital competencies like CAD/CAM software among vocational high school students in mechanical engineering, which is the focus of this study.

However, the complexity of the interface and the many parameters that need to be mastered in CAM software become significant obstacles for vocational students in the learning process. Similar challenges have also been reported in CAM learning at other mechanical engineering vocational schools, where limited hands-on facilities and minimal visualization media of work steps also hinder students' understanding and skills in this subject). This situation is reflected in the initial observations in the 11th grade Machining Engineering class at SMK Canda Bhirawa, which showed a worrying condition: out of 39 students who were study subjects, only 10 students (25.6%) were able to achieve a pretest score above the KKM (75). The average pretest score was only 60.7, and this finding indicates that most students do not yet have adequate basic competence to operate Mastercam X5 independently. Meanwhile, CAM learning at the school is still dominated by a textual approach with minimal visualization of work steps.

The project-based learning model with a demonstration approach is seen as relevant to overcoming this problem. Theoretically, mastering a skill happens through a transition from declarative knowledge (facts about a procedure) to procedural knowledge formed through repeated and reflective practice experiences[4]. The PjBL model places the teacher's live demonstration at the core of learning. The Project Based Learning (PjBL) model has characteristics where the teacher presents a problem that students have to solve, and then the students have to design the process and framework to create a solution for that problem. Students need to work together to gather information and evaluate their work so that the problem can be solved, allowing them to produce a product based on the problem background[5].

This study employs a mixed-methods approach using a Sequential Explanatory design (Creswell, 2018), which places the collection and analysis of quantitative data in the first phase, followed by the collection and analysis of qualitative data in the second phase to explain and deepen the quantitative findings. This design was selected because the improvement of students' competencies in Mastercam X5 Turning learning cannot be fully understood through quantitative data alone. The quantitative phase was used to systematically measure changes in students' practical performance through pretest and posttest results. Subsequently, the qualitative phase was conducted to explain the quantitative findings by exploring students' experiences during the implementation of Project Based Learning (PjBL) with a demonstration approach, particularly their understanding of procedural steps, ease of following the Mastercam X5 Turning operation process, difficulties encountered, and responses during the learning process. Thus, the qualitative data served to explain the learning factors and experiences underlying the changes in competency identified in the quantitative phase. The integration of both types of data provided a more comprehensive understanding of the implementation of PjBL with a demonstration approach in improving students' practical competencies in Mastercam X5 Turning learning.

Based on the literature review, a clear research gap was found. A systematic literature review on the implementation of PjBL among vocational high school students shows that this approach consistently has a positive impact on problem-solving skills and student engagement. However, most of the practices studied are still focused on the final results rather than the gradual mastery of skills, and they rarely target the specific context of CAM software learning [7]. A number of studies have examined the application of PjBL with a demonstration approach in learning Mastercam X5 turning using a mixed method that combines quantitative pretest-posttest and in-depth qualitative interviews, but such studies are still very limited. This gap forms the basis for the originality of this research.

2.1. Research Location and Timeframe

The study was conducted at SMK Canda Bhirawa Pare, Kediri Regency, East Java, Indonesia. This school was selected because it has implemented the Teaching Factory program as part of an industry-based curriculum that is directly relevant to the focus of this

study. Data collection took place during the 2026 school year.

Based on the explanation, this study aims to: (1) describe the implementation of PjBL using a demonstration approach in Mastercam X5 Turning lessons; (2) measure the improvement of student competence through pretest-posttest on 39 students; and (3) explore learning experiences through in-depth interviews with 5 informants.

2. Method

This study uses a Mixed Method. The Mixed Method Research is a research method that combines quantitative and qualitative methods[8]. This study uses a mixed method with a Sequential Explanatory design, where the researcher collects quantitative data in the first stage, then continues with collecting qualitative data. This qualitative data is used to develop the previously obtained quantitative data. The basis of this research model is that quantitative data and results provide a general overview of the research problem; more analysis, particularly through the collection of qualitative data, is needed to refine, expand, or explain the general picture[9].

The research was conducted at SMK Canda Bhirawa, Kediri, East Java, in the even semester of the 2026/2027 academic year for eight meetings (4 × 45 minutes per session). The quantitative sample consisted of 39 students from class XI Machining Engineering, chosen using total sampling because the entire population was made the sample. The qualitative informants consisted of 5 students selected purposively based on varying levels of competency achievement (very high, high, medium, sufficient, and low) so that the interview data would be clear in mapping student assessments to understand their weaknesses.

Quantitative data was collected through a pretest before implementing PjBL with a demonstration approach and a posttest after implementing PjBL with a demonstration approach. The instrument used was a Mastercam X5 Turning performance test with a scoring rubric covering four aspects: (1) creating workpiece geometry (weight 25%), (2) setting toolpath parameters (weight 25%), (3) program simulation and verification (weight 30%), and (4) post-processing NC code (weight 20%). The performance assessment instrument was validated by two experts through expert judgment to ensure that the assessment rubric was appropriate for measuring students' competencies in Mastercam X5 Turning.

The PjBL syntax used follows six stages, namely identifying the project problem, determining the steps to complete the project, creating a project completion schedule, completing and monitoring the project, preparing reports and presentations, and evaluating the project process and results[10], [11]. The demonstration approach is embedded in the stages of determining the steps to complete the project and the completion-monitoring stage, following a procedure where the teacher conveys the learning objectives, shows an overview of the material to be presented, prepares the necessary materials and tools, selects a student or performs the demonstration themselves according to the prepared scenario, all students pay attention to the demonstration, each student or group shares their observations, and the teacher draws conclusions together with the students.

Operationally, in Mastercam X5 Turning learning, the six syntaxes are implemented as follows. The first stage (identifying the project problem) begins with perception and Q&A about Mastercam X5 to explore the students' initial knowledge, while also determining the project that needs to be completed, which is a complete CNC lathe program. The second stage (determining the steps to complete the project, accompanied by a demonstration) involves the teacher demonstrating program preparation on Mastercam X5, creating the workpiece geometry, and making the turning toolpath (facing, rough turning, finish turning, grooving), Meanwhile, students observe and take notes on the steps. The third stage (creating a project completion schedule) is done individually by students based on the workflow that has been demonstrated. The fourth stage (project completion and monitoring, along with re-demonstration) involves students independently practicing creating geometry, toolpaths, as well as verifying and simulating the program using Backplot and Verify features, with the teacher re-demonstrating the parts that are challenging and monitoring the work process. The fifth stage (report preparation and presentation) involves students presenting their project results, including toolpaths and simulation outcomes. The sixth stage (process and result evaluation) is done together by the teacher and students, linked to the post-test score achievements.

Quantitative data are analyzed step by step. The analysis starts with a normality test using Shapiro-Wilk, which is suitable for sample sizes under 50, to determine whether the pretest-posttest data are normally distributed [12]. If the test results show that the data are not normally distributed, hypothesis testing continues using the Wilcoxon Signed Rank Test, since the paired t-test does not meet the normality assumption in that case [12]. This procedure is consistent with practices in similar pretest-posttest studies, where data found not to be normally distributed in the normality test are then tested with Wilcoxon to see if there are significant differences between pretest and posttest scores.

Next, the amount of competency improvement after being corrected against the pretest score was calculated using the normalized N-Gain test according to Hake's formula [13]: N-gain = (posttest score − pretest score) / (maximum score − pretest score) with categories: high (≥ 0.70), medium (0.30–0.69), and low (< 0.30). Qualitative data were analyzed using thematic analysis, which is one of the methods used to analyze collected data

[14], through four stages: understanding the data, coding, finding themes, and drawing conclusions [15]. Source triangulation was done by comparing interview data from the five informants, and then also triangulated with the N-Gain test results to strengthen the interpretation of quantitative data.

3. Results and Discussion

3.1 Quantitative Results

The competency measurement results of 39 students were done through a pretest before applying the Project Based Learning (PjBL) model with a demonstration approach and a posttest after the learning was applied. The analysis was carried out on five chapters of Mastercam X5 Turning lessons. Before testing for differences, the difference in pretest and posttest scores for each chapter was checked for normality using the Shapiro-Wilk test. Since the data didn't meet the normality assumption, the score differences were analyzed using the Wilcoxon Signed Rank Test.

Tables 1. Shapiro-Wilk Normality Test Results

Data	Shapiro-Wilk Sig.
Bab1	0,012
Bab2	0,012
Bab3	0,005
Bab4	0,004
Bab5	0,002

Table 1 shows that the Shapiro-Wilk significance values from Chapter 1 to Chapter 5 are 0.012; 0.012; 0.005; 0.004; and 0.002, respectively. All significance values are less than 0.05, so the data for the difference between pretest and posttest scores in all chapters are considered not normally distributed. Therefore, the difference in scores is further tested using the Wilcoxon Signed-Rank Test.

Table 2. Results of the Wilcoxon Signed-Rank Test

Perbandingan	Z	Sig. (2-tailed)
Post_Bab1 – Pre_Bab1	−4,908	< 0,001
Post_Bab2 – Pre_Bab2	−5,468	< 0,001
Post_Bab3 – Pre_Bab3	−5,462	< 0,001
Post_Bab4 – Pre_Bab4	−5,465	< 0,001
Post_Bab5 – Pre_Bab5	−5,463	< 0,001

Based on Table 2, all comparisons between the pretest and posttest show a significance value of $p < 0.001$. Therefore, there is a significant difference between the pretest and posttest scores from Chapter 1 to Chapter 5 after implementing PjBL with the demonstration approach.

Tables 3. Direction of Score Changes Based on the Wilcoxon Signed-Rank Test

Bab	Positive Ranks	Negative Ranks	Ties
Bab 1	34	5	0
Bab 2	39	0	0
Bab 3	39	0	0
Bab 4	39	0	0
Bab 5	39	0	0

The pattern of score changes shows a strong tendency to improve. In Chapter 1, 34 students saw their scores go up, 5 students had their scores drop, and no students had the same score. From Chapters 2 to 5, all 39 students had score increases with no decreases or unchanged scores. These findings support the Wilcoxon test results that competency changes consistently happened after the lessons.

Tables 4. Average N-Gain of Student Competencies

Bab	Mean N-Gain	Kategori
Bab 1	0,4379	Sedang
Bab 2	0,4854	Sedang
Bab 3	0,4773	Sedang
Bab 4	0,5302	Sedang
Bab 5	0,4823	Sedang

Table 4 shows that the average N-Gain across all chapters falls into the medium category. The highest N-Gain value is in Chapter 4 at 0.5302, while the lowest is in Chapter 1 at 0.4379. These results indicate an improvement in competence across all chapters, although the increase hasn't reached a high category yet, which suggests that this aspect is quite challenging and requires a deep understanding of the relationships between CNC machine parameters.

3.2 Qualitative Results

In-depth interviews with 5 sources produced five main themes through thematic analysis, as shown in Table 4. Choosing sources that reflect a range of competency achievements (posttest scores 70–100) ensures that a comprehensive and varied perspective is obtained.

Table 5. Themes from Qualitative Interview Analysis

No	Tema	Temuan kunci	Narasumber
1	Kemudahan pemahaman prosedural	Demo langsung memperjelas urutan toolpath	S1, S2, S3
2	Peran observasi aktif	Mengamati kursor guru membantu retensi memori	S1, S3, S4
3	Hambatan kecepatan demo	Demo terlalu cepat untuk ditiru siswa lambat	S4, S5
4	Motivasi intrinsik	Simulasi 3D Verify membangkitkan antusias belajar	S1,S2,S3, S4
5	Transfer konteks industri	Siswa memahami relevansi NC dengan produksi nyata	S1, S2, S5

The first theme, ease of understanding procedures, was expressed by sources S1, S2, and S3, who had high to medium achievements. All three sources stated that watching the teacher click menus directly was much easier to understand compared to reading a written guide. This finding aligns with Paivio's dual coding theory[16], the combination of verbal and visual information improves long-term memory retention, which is reflected in the significant increase in posttest scores in this group.

The second theme, the role of active observation, reveals that students are not just passive spectators during demonstrations. The PhD source described their strategy of making notes on the sequence of teacher menu clicks as a guide for independent practice, a form of self-regulation. [17]Zimmerman states that Self-Regulated Learning is the learner's or student's ability to actively participate in their learning process, whether metacognitively, motivationally, or behaviorally, from the PjBL model with a demonstration approach.

The third theme, demonstration speed barriers, was identified from sources S4 and S5, whose scores were below average or incomplete. Both mentioned that the speed of the teacher’s demonstration, especially at the stage of setting toolpath parameters with many dialog boxes, was sometimes too fast to follow all at once. This finding qualitatively explains why the N-gain for the toolpath parameter aspect (0.63) is lower than for other aspects.

The fourth theme, intrinsic motivation, came up from four sources (S1–S4). Seeing the 3D visualization simulation of the tool movement in the Verify feature of Mastercam X5 was described as an 'aha' experience that boosted learning enthusiasm. Interestingly, source S4 even though their score was below average admitted that their motivation actually increased after seeing the simulation, indicating the value of PjBL with a demonstration approach in boosting intrinsic motivation even for students with low achievement.

The fifth theme, transferring to an industrial context, shows that hands-on demonstrations help students understand the relevance of the NC program to real production. Respondents S1 and S2 mentioned being aware that the toolpaths generated by Mastercam X5 directly control the cutter movement on the CNC machine, so programming mistakes directly affect product quality. This contextual awareness is an important indicator of vocational high school graduates' job readiness.

3.3 Data Triangulation

Triangulation of quantitative and qualitative data shows complementary findings. Quantitative data indicates a significant difference between pretest and posttest scores across all chapters with a p-value < 0.001, while the N-Gain for all chapters falls in the medium category (0.4379–0.5302). Qualitative findings explain that this improvement is supported by students finding it easier to understand procedures through demonstrations, active observation, hands-on practice in projects, and the use of Verify simulations, which boost learning motivation.

On the other hand, interviews with S4 and S5 showed that the speed of demonstrations, especially when setting toolpath parameters, is still a hurdle for some students. These findings complement the quantitative results by showing that although competency improved, the level of improvement wasn't optimal for all students. Overall, the quantitative data provides evidence of competency changes, while the qualitative data explains the learning experiences that accompanied those changes. Since the study didn't use a control group, the improvements can't be attributed solely to PjBL with the demonstration approach.

4. Conclusion

Based on a mixed-methods study using a sequential explanatory design involving 39 students and 5 interviewees it can be concluded that: (1) the Project-Based Learning (PjBL) model, integrated with a demonstration approach, was implemented through six structured steps in teaching Mastercam X5 Turning to 11th-grade Machining Engineering students at SMK

Canda Bhirawa; (2) quantitatively, there was a significant difference between pretest and posttest results across all units ($p < 0.001$, according to the Wilcoxon Signed-Rank Test), with N-Gain scores indicating a moderate level of competency improvement (ranging from 0.4379 to 0.5302); and (3) qualitatively, five interview themes revealed that demonstrations facilitated procedural understanding, active observation, learning motivation, and insight into industrial contexts, although the pace of the demonstrations posed a challenge for some students. Overall, the quantitative and qualitative findings complement each other, demonstrating an improvement in competency following the implementation of PjBL with a demonstration approach. It is recommended that teachers provide pre-recorded demonstration videos allowing students to observe the software in usean d incorporate pauses and practice sessions during complex stages to facilitate hands on learning. Additionally, the use of worksheets (jobsheets) is advised to clarify the steps in alignment with the PjBL framework and the demonstration approach. Future research should consider incorporating a control group and measuring practical skill proficiency to provide more robust evidence regarding the effectiveness of this instructional method.

References

[1] E. Adrianto, K. A. Larasati, D. Rachmawaty, A. Munang, and H. D. Prihartanto, "Peningkatan Literasi Teknologi Siswa SMA melalui Pengenalan Desain dan Manufaktur Berbasis Komputer (CAD / CAM)," vol. 6, no. 1, 2026, doi: 10.20895/ijcosin.v6i1.10587.

[2] I. A. Putra *et al.*, "Pengaruh Strategi Toolpath terhadap Estimasi Waktu Pemesinan dan Cusp Height pada Geometri Freeform," vol. 9, no. 2, pp. 209–226.

[3] M. Ningrum, "Jurnal Ilmu Manajemen dan Pendidikan Efektivitas Kebijakan Link and Match dalam Pendidikan Vokasi : Menakar Kesiapan Lulusan Memasuki Dunia Kerja," vol. 5, no. 1, pp. 51–58, 2025.

[4] K. Saks, H. Ilves, and A. Noppel, "education sciences The Impact of Procedural Knowledge on the Formation of Declarative Knowledge : How Accomplishing Activities Designed for Developing Learning Skills Impacts Teachers ' Knowledge of Learning Skills," 2021.

[5] S. A. Aziz and K. Nurachadijat, "Project Based Learning dalam Meningkatkan Keterampilan Belajar Siswa," *J. Inovasi, Eval. dan Pengemb. Pembelajaran*, vol. 3, no. 2, pp. 67–74, 2023, doi: 10.54371/jiepp.v3i2.273.

[6] M. A. Ramadhan, A. Maulana, A. A. Islami, M. Rijal, V. Lukad, and P. Sutrisno, "JINoP (Jurnal Inovasi Pembelajaran)," vol. 8, no. November, pp. 224–233, 2022.

[7] N. N. Arifin, A. Maulana, D. Rizqullah, G. H. Pratama, and L. Syahrul, "Studi Literatur : Analisis Kesenjangan Implementasi Project Based Learning dalam Mendukung Kemampuan Problem Solving Siswa SMK," vol. 5, no. 2, pp. 1107–1115, 2026.

[8] D. S. Azhari *et al.*, "Penelitian Mixed Method Research Untuk Disertasi," *Innov. J. Soc. Sci. Res.*, vol. 3, pp. 8010–8025, 2023.

[9] R. Justan and A. Aziz, "Penelitian Kombinasi (Mixed Methods)," vol. 3, no. 2, pp. 253–263, 2024.

[10] M. M. Muhibbullah, V. Z. Alviani, and D. Natasya, "Analisis Kesesuaian Implementasi Sintaks Project Based Learning dalam Proses Pembelajaran," vol. 5, no. 1, pp. 42–57, 2024.

[11] I. Students, A. To, C. Curriculum, P. Based, and L. Model, "PENINGKATKAN KEMAMPUAN MAHASISWA DALAM MERANCANG KURIKULUM MELALUI PENERAPAN PROJECT BASED LEARNING IMPROVEMENT STUDENTS ABILITY TO CONSTRUCT CURRICULUM THROUGH," no. 2, pp. 49–58.

[12] H. Title *et al.*, *Table of Contents*.

[13] C. Kuliah *et al.*, "Normalized Gain: Ukuran Keefektifan Treatment," pp. 2–5, 2021.

[14] P. Analisis and K. Dan, "Penggunaan analisis konten dan analisis tematik," 2022.

[15] R. R. Hake, "Interactive-engagement versus traditional methods : A six-thousand-student survey of mechanics test data for introductory physics courses," no. May 1997, pp. 64–74, 1998.

[16] P. Mata and P. Sejarah, "Sri Pajriah," *PENGARUH PEN ERAPAN Model PEMBELAJARAN DUAL CODING TERHADAP PENINGKATAN Has. BELAJAR SISWA PADA MATA PELAJARAN Sej.*, pp. 77–86, 2017.

[17] Oktariani and D. Pelangi, "the Relationship Between Self Regulated Learning and Student Discipline of Smk Pab 1 Helvetia Hubungan Self Regulated Learning Dan Displin Siswa Smk Pab 1 Helvetia," *J. Soc. Econ. Res.*, vol. 4, no. 2, pp. 174–181, 2022, [Online]. Available: https://idm.or.id/JSER/inde