



Universitas Sebelas Maret

E-ISSN: 3025-8316

# **INDONESIAN JOURNAL OF LEARNING AND INSTRUCTIONAL INNOVATION**

VOLUME 03 NOMOR 01 2025



# Editorial Team

## Editor-in-Chief

**Dr. Eka Budhi Santosa, M.Pd.**

Head of the Bachelor Program in Educational Technology, Universitas Sebelas Maret, Indonesia.  
Vice Chairman of the Association of Indonesian Educational Technology Professionals (IPTPI).

## Managing Editor

**Dr. Relly Prihatin, M.Pd.**

Lecturer at Universitas Sebelas Maret, Indonesia

## Editorial Board

**Prof. Dr. Nunuk Suryani, M.Pd.**

Director General of Teachers and Education Personnel, Ministry of Primary and Secondary Education,  
Republic of Indonesia  
Professor at Universitas Sebelas Maret, Indonesia.

**Assoc. Prof. Ts. Dr. Mahizer bin Hamzah**

Associate Professor at Universiti Pendidikan Sultan Idris (UPSI), Malaysia.

**Prof. Dr. Dedi Kuswandi, M.Pd.**

Professor at Universitas Negeri Malang (UM), Indonesia.

**Prof. Dr. Asrowi, M.Pd.**

Professor at Universitas Sebelas Maret, Indonesia.

**Prof. Dr. Agus Efendi, M.Pd.**

Professor at Universitas Sebelas Maret, Indonesia.

**Dr. Fatma Sukmawati, M.Pd.**

Treasurer of the Association of Indonesian Educational Technology Professionals (IPTPI).  
Lecturer at Universitas Sebelas Maret, Indonesia

**Dr. Triana Rejekiningsih, M.Pd.**

Lecturer at Universitas Sebelas Maret, Indonesia

# Table of Contents

Editorial Teams	I
Table of Content	I
Published Articles	II
Comments from the Editor	III





# PUBLISHED

## Vol. 3 No. 1 (2025): Indonesian Journal of Learning and Instructional Innovation: June

DOI: <https://doi.org/10.20961/ijolii.v3i01>

Published: 2025-06-30

1-8

### Analysis of The Internal Quality Assurance System at Pangudi Luhur Bintang Laut Surakarta Middle School

Lintang Pramusita Wiyartiningtyas

Educational Technology, Sebelas Maret University, Surakarta, Indonesia

Destriana Kurniawati

Educational Technology, Sebelas Maret University, Surakarta, Indonesia

9-18

### Implementation of the Outdoor Study Method to Improve Natural Science Learning Outcomes for Class V Students

Auliantika Selian

Master of Education, Albukhary International University, Malaysia

Relly Prihatin

Educational Technology, Sebelas Maret University, Surakarta, Indonesia

19-30

### Pedagogical Innovation of Game-Based Learning for 21st Century Skills in Vocational Education: A Systematic Literature Review

Elvi Raziana

Chemistry Education, Universitas Islam Indonesia, Yogyakarta, Indonesia

Hilmawan Wibawanto

Education, Sebelas Maret University, Surakarta, Indonesia

31-38

### A Historical Review of Educational Technology: Evolving Definitions and Milestones (1970-2024)

Ahmed Abdi Mohamed

Master of Educational Technology, Universitas Sebelas Maret, Surakarta, Indonesia

Auliantika Selian

Master of Education, Albukhary International University, Alor Setar, Malaysia

39-46

### Implementasi Model Problem-Based Learning dengan Pendekatan Berdiferensiasi Berbasis Kemampuan Awal Siswa dan Teori Zone of Proximal Development (ZPD) untuk Meningkatkan Keaktifan Belajar di Kelas X TJKT SMK Negeri 1 Sukoharjo

Puruhita Mega Pawitra

Teacher Professional Education, Universitas Sebelas Maret, Surakarta, Indonesia

Cucuk Wawan Budiyanoto

Informatics Engineering Education, Universitas Sebelas Maret, Surakarta, Indonesia

Joko Slamet Raharjo

SMK Negeri 1 Sukoharjo, Sukoharjo, Indonesia

47-53

### Supervisi Akademik dalam Meningkatkan Kualitas Pembelajaran di Pendidikan Vokasi: Studi Kualitatif di SMK Negeri

Jonanda Anugerah

Master of Educational Technology, Universitas Sebelas Maret, Surakarta, Indonesia

Eka Budhi Santosa

Master of Educational Technology, Universitas Sebelas Maret, Surakarta, Indonesia





## Comments from the Editor

### **Dr. Eka Budhi Santosa, M.Pd.**

Head of the Bachelor Program in Educational Technology, Universitas Sebelas Maret, Indonesia.  
Vice Chairman of the Association of Indonesian Educational Technology Professionals (IPTPI).

We are pleased to present the first issue of 2025 for the Indonesian Journal of Learning and Instructional Innovation (Vol. 3, No. 01, June 2025). This edition continues our commitment to exploring transformative educational strategies at both the school and vocational levels, offering a diverse collection of research aimed at enhancing instructional quality. The articles featured in this volume address critical pillars of modern education, ranging from robust quality assurance frameworks in secondary schools to the revitalization of vocational education through strategic academic supervision. By bridging administrative excellence with classroom practice, these contributions provide a holistic view of how institutional oversight can directly impact learning outcomes.

Innovation in this issue is further explored through dynamic pedagogical models designed for the 21st-century learner. Our contributors delve into the effectiveness of outdoor learning in improving science outcomes and the integration of game-based learning to foster essential modern skills. Furthermore, the issue offers profound theoretical and historical insights, including a comprehensive review of educational technology's evolution from 1970 to 2024, and the application of differentiated problem-based learning rooted in the Zone of Proximal Development (ZPD) theory. Collectively, these articles underscore the importance of adapting instructional methods to meet diverse student needs, ensuring that innovation remains both evidence-based and inclusive for the future of Indonesian education.



## **Analysis of The Internal Quality Assurance System At Pangudi Luhur Bintang Laut Surakarta Middle School**

**Lintang Pramusita Wiyartiningtyas<sup>1</sup>, Destriana Kurniawati<sup>2</sup>**

<sup>1,2</sup>Educational Technology, Sebelas Maret University, Surakarta, Indonesia

Email: <sup>1</sup>[bernadeta@student.uns.ac.id](mailto:bernadeta@student.uns.ac.id)\*, <sup>2</sup>[destriana\\_rniawati19@student.uns.ac.id](mailto:destriana_rniawati19@student.uns.ac.id)

\*Corresponding Author

*Article History: Received: Jan 24, 2025; Accepted: Apr 24, 2025; Published: Jun 01, 2025*

### **ABSTRACT**

Education is a lifelong learning experience, which has a positive influence on individuals. Education management requires the implementation of a quality assurance system, which is implemented through six stages of the internal quality assurance cycle, consisting of: (1) quality mapping, (2) preparation of a fulfillment plan, (3) implementation of quality fulfillment, (4) evaluation, and (5) preparation of standards. In research to determine the internal quality assurance system (SPMI) at SMP Bintang Laut Surakarta, the method used was a qualitative approach with descriptive methods, which began with interviews, documentation, and descriptions of research data. Based on the research that has been carried out, SMP Bintang Laut Surakarta has implemented an Internal Quality Assurance System, by the SPMI cycles and stages: (1) quality mapping based on School Self-Evaluation (EDS) and DAPODIK, (2) preparation of quality improvement plans through planning mature which includes curriculum, student affairs, infrastructure, human relations, and IT facilities, (3) implementation of a fulfillment plan involving all parties in the school with clear targets, (4) monitoring and evaluation carried out every three months by the deputy principal and at the end of each year by the Pangudi Luhur Foundation, and (5) setting new standards for the 2024/2025 school year which includes the formation of a learning committee for school quality assurance involving the principal, teacher, school committee and parents.

**Keywords:** *Quality Assurance, Quality Assurance System, Education, Middle School*



**Copyright © 2025 The Author(s)**

**This is an open-access article under the [CC BY-SA](https://creativecommons.org/licenses/by-sa/4.0/) license.**

### **INTRODUCTION**

Education is all learning experiences that last throughout life, in all environments and situations that have a positive influence on the growth of each individual (Pristiwanti et al., 2022). In the educational process, the benchmark for the quality of an educational institution can be reflected in the quality of students who excel and achieve in various fields (Albab et al., 2023). The quality of superior students is also influenced by various factors, including the quality of services in the teaching and learning process at school (Halawa & Mulyanti, 2023). To support the goal of improving the quality of graduates and services in formal educational institutions,

schools need to have quality standards that regulate each series of educational unit work throughout the educational process (Albab et al., 2023; Halawa & Mulyanti, 2023).

In line with developments over time, education also requires efforts to improve and improve quality, which is in line with community needs (Arbangi, Dakir, & Umiarso, 2016). Quality in the world of education can be interpreted as the degree of excellence in managing education effectively and efficiently to produce academic and non-academic excellence in students. In the management of education, there are quality standards that aim to improve the quality of educational services. Therefore, to achieve these standards, it is necessary to involve all school resources in good, directed, and integrated management by the function of each field within the school.

Implementation of sustainable school quality management requires monitoring and evaluation in the form of a framework that can be carried out through a quality assurance system. The education quality assurance system can also be interpreted as a systematic and integrated activity in providing education, to increase the intelligence of the nation's life (Farid & Atikah, 2024). This system has been stated in the *Peraturan Menteri Pendidikan dan Kebudayaan Republik Indonesia No. 28 Tahun 2016* (Regulation of the Minister of Education and Culture of the Republic of Indonesia No. 28 of 2016), states that the education quality assurance system is a unified element consisting of an integrated organization, policy, and process that regulates all activities to improve the quality of primary and secondary education which interacts with each other in a systematic, planned, and sustainable manner.

This system ensures that each component in the school functions optimally and supports each other to achieve the educational goals that have been set. Fadhli (2020) stated that the quality assurance system in educational institutions absolutely must be carried out well because it is used as a tool for quality control or supervision of quality in educational institutions.

There are two components of the quality assurance system, namely the internal quality assurance system and the external quality assurance system. The Internal Quality Assurance System (SPMI) is a quality assurance process carried out within an educational institution and carried out independently by all components of the educational institution. Meanwhile, the External Quality Assurance System (SPME) is a quality assurance process carried out by government institutions, including both regional governments and accreditation bodies and standards bodies (Setiyo, 2021).

In this research, the quality assurance system is focused on quality assurance carried out by internal parties from educational institutions. SPMI is carried out to supervise the implementation of education in a sustainable manner (continuous improvement) and to enhance the quality of education which involves all elements consisting of organizations, policies, and integrated processes that regulate all activities to improve the quality of education in a systematic, planned and sustainable manner (Puspitasari, 2018 ). SPMI is also referred to as an education quality assurance system in educational units that covers all aspects of education implementation by utilizing various resources to achieve SNP (Asy'ari & Mukaromah, 2019).

The education unit implements the entire cycle of the quality assurance system independently and continuously until a culture of quality is built in the education unit. Quality assurance steps in the internal quality assurance cycle in educational units consist of (1) quality mapping, (2) preparation of a compliance plan, (3) implementation of quality compliance, (4) quality evaluation/audit, and (5) preparation of the above standards SNP (Sulastrri, Jaja, & Heri, 2020).

Pangudi Luhur Bintang Laut Middle School is one of the schools in Surakarta that still implements the Internal Quality Assurance System (SPMI) to improve the quality of education through various innovations and programs oriented towards improving quality. Therefore, researchers carried out further observations and analyses to determine the implementation of quality assurance at Pangudi Luhur Bintang Laut Middle School.

## **METHODS**

The research method used is a qualitative descriptive method. The qualitative approach emphasizes descriptions that explain an ongoing activity or situation as well as a person's attitude or behavior in detail (Fadli, 2021). The aim of research using a descriptive qualitative approach is to maintain the form and content related to analysis, description, and accurate depiction of the facts being investigated (Prasanti, 2018). Research data collection was carried out through interviews and documentation. The interview was conducted directly with the Chief Executive of SPMI at Pangudi Luhur Bintang Laut Middle School by asking questions related to the implementation of the school quality assurance system. Meanwhile, documentation was carried out to sharpen the research analysis through analysis of the guidebook owned by Pangudi Luhur Bintang Laut Middle School.

## **RESULTS AND DISCUSSION**

### **1. Quality Mapping at Pangudi Luhur Bintang Laut Middle School Surakarta**

According to Puspitasari (2018), quality mapping is the activity of mapping the quality of education in educational units based on SNP through self-evaluation activities that produce quality maps (standard achievements). Furthermore, Amirzal, et al. (2024), stated that quality mapping is the process of collecting, processing, and analyzing data/information about the achievement of fulfilling national education standards, which will produce recommendations in the form of programs and activities for subsequent quality fulfillment.

Quality mapping in schools based on the National School Education Standards (SNP). In line with this, Pangudi Luhur Bintang Laut Middle School has done quality mapping based on SNP and more in detail using School Self-Evaluation (EDS). This quality mapping is carried out through the monitoring of teachers by assisted Deputy Principals Staff and a committee to see how learning and obligations are implemented by teachers, how this is achieved, school program targets and objectives, as well as anything else that needs to be repaired.

Pangudi Luhur Bintang Laut Middle School has also determined the quality of education based on the help of the Computer-Based Integrated Data Collection application (DAPODIK), namely educational assessments and reports to determine deficiencies in the implementation of school programs. needs to be repaired. Then, the program implementation report found by the Deputy Principal team, as well as input from the education report card will be submitted to the SPMI team to proceed to stage planning to improve school quality.

### **2. Quality Improvement Planning at Pangudi Luhur Bintang Laut Surakarta Middle School**

The next stage is preparing a plan to improve school quality which is part of school management and consists of curriculum, infrastructure, extracurricular activities, human resources, and so on (Amrizal, 2023). Planning is carried out with the aim of monitoring so that quality improvement can be carried out continuously because without careful planning a program or activity will not run well (Istikomah, Romadhon, & Kurniawan, 2022).

According to Rahwati (2019), in general, a school as an educational institution has school goals that are reflected in the vision and mission. This vision and mission can be achieved by preparing school programs and school activities, including preparing plans to

improve school quality. The preparation of quality improvement plans is carried out in the form of school work plans, both medium-term and annual (Shobirin, Uliyah, & Syafi'i, 2022). Planning or targets related to improving quality at Pangudi Luhur Bintang Laut Middle School are carried out based on the school's vision and mission, which are then further developed into several achievement indicators.

The SPMI team at Pangudi Luhur Bintang Laut Middle School also conducted comparative studies of schools with strong internal quality assurance and driving schools as part of their quality improvement planning. Additionally, each deputy principal has specific targets as part of their quality improvement plan. The targets are described as follows,

- a. Deputy Head of Curriculum: all teachers can understand and implement the Independent Curriculum well.
- b. Deputy Head of Infrastructure: provides facilities and infrastructure that support the implementation of the Independent Curriculum.
- c. Deputy Head of Public Relations: able to carry out branding, marketing, and selling.
- d. Deputy Head of HR: monitors teacher performance in the learning process.
- e. Deputy Head of Student Affairs: students can win every competition activity they participate in.
- f. IT Staff: create and monitor the school LMS.

### **3. Implementation of the Fulfillment Plan at Pangudi Luhur Bintang Laut Middle School Surakarta**

Implementation can be interpreted as the implementation stage of creating a school with superior quality. This implementation stage is the realization of the program planned by each team according to the task as well as their responsibility which is stated in the strategic plan of each educational unit (Istikomah, Romadlon, & Kurniawan, 2022).

The implementation of the fulfillment plan at Pangudi Luhur Bintang Laut Middle School is carried out based on the implementation guidebook that has been made by the school principal and is owned by all teaching staff and educational staff. Implementation of the fulfillment plan at Pangudi Luhur Bintang Laut Middle School is based on targets that need to be achieved by each deputy principal, which are stated in detail as follows,

#### **a. Deputy Principal for Curriculum**

In implementing educational services, there are still teachers at Pangudi Luhur Bintang Laut Middle School who do not fully understand and can apply the Merdeka Curriculum in their learning. So, based on these problems, the Head of Curriculum set a target that all teachers can understand and implement the Merdeka Curriculum well.

Based on these targets, efforts have been made to fulfill the targets that are ongoing to date, namely:

- 1) Teachers are required to take part in training related to the Merdeka curriculum at least once a month, both online and offline.
- 2) Setting standards for implementing the Merdeka Curriculum in Schools.
- 3) Collaborate with national curriculum experts as consultants and presenters to increase understanding regarding the Merdeka Curriculum.

#### **b. Deputy Principal for Facilities and Infrastructure**

The target of the Deputy Principal of facilities and infrastructure in implementing fulfillment is to provide facilities and infrastructure that can support the implementation of the Merdeka Curriculum. To meet this target, activities done are as follows,

- 1) Supporting the existence of smart schools with integrity that can still be maintained. One way is to develop an exam browser that can be accessed via

smartphone, but has a system that can minimize cheating. Apart from that, together with IT staff, Pangudi Luhur Bintang Laut Middle School also has its learning management system (LMS) with complete features which are the main media used in daily learning, including accessing learning materials, quizzes, and attendance.

- 2) Providing adequate facilities in each class to support learning activities. This has been implemented by providing a WiFi router in each class and providing a smart TV as a learning medium in class.
- 3) Providing equipment to support extracurricular activities or other non-academic activities.

c. Deputy Principal for Public Relations

The deputy principal for public relations has the task of carrying out branding, marketing, and selling related to the advantages or achievements of Pangudi Luhur Bintang Laut Middle School to the general public. This is done so that Pangudi Luhur Bintang Laut Middle School can be widely known, especially outside the city of Surakarta.

The activities carried out are related to branding, marketing, and selling as an implementation of quality fulfillment, namely:

- 1) *Branding*: conduct open houses, events, and visits to schools, as well as collaborate with other institutions. Apart from that, branding activities are also carried out by creating a program that will be implemented by Pangudi Luhur Bintang Laut Middle School within one year.
- 2) *Marketing*: always offers and explains advantages that are owned by Pangudi Luhur Bintang Laut Middle School in activities involving external parties that are disorganized, as well as explaining the competencies of graduates from Pangudi Luhur Bintang Laut Middle School.
- 3) *Selling*: make visits to target schools involving the OSIS and several student representatives as representatives of extracurricular members at Pangudi Luhur Bintang Laut Middle School, to attract the interest of students from target schools to register at Pangudi Luhur Bintang Laut Middle School.

d. Deputy Head of School Division Human Resources (HR)

The Deputy Principal for Human Resources implements quality compliance by monitoring teachers' abilities and performance in the learning process and improving teacher performance in readiness to face students and their parents. Teacher performance monitoring activities can be carried out by monitoring the school's LMS regarding attendance, learning preparation, and learning activities carried out by teachers. Besides that, HR is also obliged to plan programs to increase teacher performance, which is in general done at least once every month.

e. Deputy Principal for Student Affairs

The deputy principal for the student affairs sector implements quality compliance by ensuring that students can win the various competitions they participate in, both in academic and non-academic fields. Efforts made to fulfill this quality are by holding extracurricular activities and regular training. In this case, this target has been achieved, one of which is in the basketball competition. Besides that, can also encourage students to take part in organized competitions.

Implementation of quality assurance fulfillment in terms of learning in schools is also supported by the Learning Management System (LMS) of Pangudi Luhur Bintang Middle School, which can be accessed by teachers, students, and students' parents. One of the features of the LMS is student attendance and results, so that parents of students can directly monitor their children's learning outcomes and attendance at school.

Pangudi Luhur Bintang Laut Middle School LMS also provides a feature where students can write complaints and reports regarding existing infrastructure that needs to be fixed, such as the unavailability of markers in class, problems with smart TVs, and so on. Besides that, students and parents can also report other students' behavior such as bullying or other less commendable actions, so that teachers at school can follow up on this matter.

#### **4. Monitoring and Evaluation of the Quality Fulfillment Implementation Process**

Monitoring and evaluation are two things that cannot be separated in the implementation of an internal quality assurance system. Monitoring is an activity that aims to find out and measure whether the planned program is running well or not. Meanwhile, evaluation is an activity whose direction is emphasized in controlling the achievement of predetermined goals (Istikomah, Romadlon, & Kurniawan, 2022). Evaluation is carried out internally to ensure whether the implementation of quality improvement is proceeding according to the plan that has been prepared or not.

Pangudi Luhur Bintang Laut Middle School carries out monitoring carried out by the deputy principal every 3 months. Large monitoring activities are also carried out by the Pangudi Luhur Foundation at the end of each school year. This major monitoring activity includes reports of accountability carried out by the school principal to the foundation. Apart from monitoring, the school also carries out evaluation activities which are carried out at the end of each school year through work meetings, to discuss performance and targets for that year. Evaluation activities were also carried out to discuss new standards that would be implemented in this year's lesson next. In this regard, in lesson 2024/2025, Pangudi Luhur Bintang Laut Middle School will update its vision and mission to make it more relevant to the implementation of learning in the Merdeka Curriculum.

Monitoring or further monitoring of each school program that has been implemented throughout the 2023/2024 school year, will only be evaluated in more detail at the final work meeting academic year 2023/2024 and the start of the 2024/2025 school year. This relates to a detailed evaluation of the sustainability of the education program, its implementation, shortcomings, and solutions.

#### **5. Establishment of New Standards at Pangudi Luhur "Bintang Laut" Middle School**

This stage is an activity to develop a strategy that is carried out if the school has not yet obtained the National Education Standards (SNP) based on the previous strategy. The fifth stage is carried out by setting standards above the SNP on standards that have been met and improving strategies for fulfilling quality, especially on standards that have not yet been met based on monitoring and evaluation results (Puspitasari, 2018).

The setting of new standards at Pangudi Luhur Bintang Laut Middle School was carried out through a work meeting. The result of the meeting to establish new standards for the 2024/2025 academic year was to develop a new vision and mission that is more relevant to the Merdeka Curriculum, as well as build a learning committee to serve in school quality assurance. This "Komite Pembelajaran" consists of the principal, several teachers, the school committee, and student's parents. To carry out quality assurance, the plan is for this learning committee to be given the authority to summon and develop teachers whose performance is not following the targets set through working meetings at the end of the 2023/2024 school year and the beginning of the 2024/2025 school year.

## CONCLUSION

Improving the quality of education in schools is increasingly crucial to producing quality graduates. Schools must have integrated quality standards in every educational process. Education quality is a measure of success in effective and efficient educational management, which includes students' academic and non-academic achievements. As times change, education must also continue to improve its quality to meet society's needs.

The Quality Assurance System is a framework for monitoring and evaluating school quality management as regulated in in Regulation of the Minister of Education and Culture of the Republic of Indonesia No. 28 of 2016 (*Permendiknas No. 28 tahun 2016*), which includes internal (SPMI) and external (SPME) quality assurance systems. SPMI covers all aspects of education implementation to improve the quality of education systematically and sustainably.

The results of the research show that Pangudi Luhur Bintang Laut Middle School has carried out five stages of the SPMI cycle, namely (1) quality mapping based on School Self-Evaluation (EDS) and DAPODIK, (2) preparing a quality improvement plan through careful planning which includes curriculum, student affairs, infrastructure, HR, public relations and IT facilities, (3) implementation of a fulfillment plan involving all parties in the school with clear targets, (4) monitoring and evaluation carried out every three months by the deputy principal and at the end of every year by the Pangudi Luhur Foundation, and ( 5) setting new standards for the 2024/2025 school year which includes the formation of a learning committee for school quality assurance involving the school principal, SPMI team, school committee and student's parents.

The implementation of SPMI at Pangudi Luhur Bintang Laut Middle School plays an important role in sustainably improving the quality of education. Through continuous evaluation and improvement, schools can achieve higher educational standards that are relevant to the demands of the times.

## ACKNOWLEDGEMENTS

We thank Dr. Eka Budhi Santosa, ST., M.Pd. as the Systems Approach and Performance Technology course lecturer. We would also like to thank Pangudi Luhur Bintang Laut Surakarta Middle School, especially Mikael Eko Prihardono, S.Pd and Tutik Kristinawati, S.Pd, who have agreed to be our sources regarding school quality assurance analysis.

## REFERENCES

- Afiyah, Z., Hikmah, S., & Fitri, J. (2023). Madrasah Head's Strategy in Implementing the Internal Quality Assurance System at Madrasah Ibtidaiyah Negeri 1 Batang Hari. *Educational Leadership: Journal of Educational Management*, 3(2), 174–186.
- Albab, SU, Muslimin, I., Zuhriyah, IA, & Hernawati, S. (2023). Education Quality Management in Improving Student Achievement in Batu City State Madrasah Aliyah. *Ar-Rosikhun: Journal of Islamic Education Management*, 2(2), 98–106. <https://doi.org/10.18860/rosikhun.v2i2.18248>
- Arbangi, Dakir, & Umiarso. (2016). *Education Quality Management*. Kencana.
- Arisandi, D., & Lubis, W. (2024). Implementation of Accelerated Education Policy and Quality (Implementation of Eight National Education Standards at the National Space Aviation Vocational School (SPAN) Medan). *Journal of Business Economics, Management and Accounting (JEBMA)*, 4(2), 631–637.
- Barnawi, & Arifin, M. (2017). *Education Quality Assurance System*. AR-RUZZ MEDIA.
- Fadhli, M. (2020). Internal and External Quality Assurance Systems in Higher Education Institutions. *AL-TANZIM: Journal of Islamic Education Management*, 4(2), 53–65. <https://doi.org/10.33650/al-tanzim.v4i2.1148>

- Farid, I., & Atikah, C. (2024). Quality Assurance System for Early Childhood Education (Paud). *Innovative: Journal Of Social Science Research*, 4(1), 4852–4861.
- Halawa, AN, & Mulyanti, D. (2023). Factors that influence improving the quality of educational and learning institutions. *World Inspiration: Journal of Education and Language Research*, 2(2), 57–64.
- Istikomah, I., Romadlon, DA, & Kurniawan, ABH (2022). Implementation of an Internal Quality Assurance System in Elementary Schools. *Procedia of Social Sciences and Humanities*, 3, 678–685.
- Peraturan Menteri Pendidikan dan Kebudayaan Republik Indonesia No. 28 Tahun 2016
- Pranata, A., Miranda, DA, & Yunita, FR (2023). Implementation of an Internal Quality Assurance System in Improving the Quality of Learning at Madrasah Ibtidaiyah Negeri 4 Batanghari. *MUNTAZAM: JOURNAL OF ISLAMIC EDUCATIONAL MANAGEMENT*, 4(02), 36–44.
- Pristiwanti, D., Badariah, B., Hidayat, S., & Dewi, RS (2022). Understanding Education. *Journal of Education and Counseling*, 4(6), 7911–7915. <https://doi.org/https://doi.org/10.31004/jpdk.v4i6.9498>
- Puspitasari, H. (2018). Learning Process Standards as an Internal Quality Assurance System in Schools. *Muslim Heritage*, 2(2), 339–368.
- Suarga, S. (2017). Managerial Capabilities of Islamic Boarding School Leaders in Human Resources Management. *Idaarah*, 1(2), 338007.
- Sularno, M., Wasliman, I., Muchtar, HS, & Warta, W. (2022). Management of Higher Education Internal Quality Assurance Systems in Improving the Quality of Graduates. *Islamic Education: Journal of Islamic Education*, 11(001).
- Sulastri, T. (2020). Implementation of an Internal Quality Assurance System in Improving the Quality of Education Services: Research in SPMI Model Schools SD Darul Hikam 2 Bandung Regency and SDN 200 Leuwipanjang Bandung City. *Al-Hasanah: Journal of Islamic Religious Education*, 5(2), 53–60.
- Supawi, S., & Haryati, T. (2023). Education Quality Management in the Era of Regional Autonomy. *Journal of Integrated Education*, 4(1).
- Tanjung, R., Supriani, Y., Mayasari, A., & Arifudin, O. (2022). Quality Management in Education Delivery. *GLASSER JOURNAL OF EDUCATION*, 6(1), 29. <https://doi.org/10.32529/glasser.v6i1.1481>

## Implementation of the Outdoor Study Method to Improve Natural Science Learning Outcomes for Class V Students

Auliantika Selian<sup>1</sup>, Relly Prihatin<sup>2</sup>

<sup>1</sup>Master of Education, Albukhary International University, Malaysia

<sup>2</sup>Educational Technology, Sebelas Maret University, Surakarta, Indonesia

E-mail: [1auliantika.selian@student.aiu.edu.my](mailto:auliantika.selian@student.aiu.edu.my)\*, [2relly.prihatin@staff.uns.ac.id](mailto:relly.prihatin@staff.uns.ac.id),

\*Corresponding Author

Article History: Received: Feb 16, 2025; Accepted: Apr 24, 2025; Published: Jun 01, 2025

### ABSTRACT

This study aims to describe the application of the outdoor study method to improve the learning outcomes of natural science students in grade V of SD Negeri Kleco I Surakarta. This research was carried out at SD Negeri Kleco I Surakarta. The research subjects consisted of 20 students who had intermediate academic abilities. This research is a classroom action research that is carried out in a cyclical manner. Each cycle consists of planning, implementation, observation, and reflection steps. The data collection techniques used are observation techniques and data analysis techniques. In this study, qualitative and quantitative data analysis techniques are used. For qualitative data descriptions, they can be analyzed using observation sheets, while quantitative descriptions are carried out with tests that have been given. The learning outcomes in cycle 1 were 71.67% with a good category and in cycle 2 an average score increase of 78.33% was obtained with a good category. Likewise with the completeness of student learning, in cycle 1 there were 13 students or 83.33% who completed and in cycle 2, 100% of students were obtained. It can be concluded that the application of the outdoor study method to improve the learning outcomes of natural science students in grade V of SD Negeri Kleco I Surakarta is good.

**Keywords:** *outdoor study, learning outcomes, observation*



Copyright © 2023 The Author(s)

This is an open access article under the [CC BY-SA](https://creativecommons.org/licenses/by-sa/4.0/) license.

### INTRODUCTION

Elements related to education have a significant impact on the standard of living of a country. In order to build an intelligent and insightful nation, the role of education is very important. Education plays an important role in life because it is a means of developing and improving the quality of human resources. Educational institutions are required to be more adaptable to the advancement of science considering the ever-evolving world of education (Cahyono et al., 2024)

Schools are a very strategic place to implement environmental education that focuses on knowledge, values, and positive habits and to plan and raise awareness of how important attitudes and behaviors are to preserve the environment. To realize an intellectual, peaceful, open, and democratic life, education plays a very important role. The formation of quality human resources is inseparable from the responsibility of a teacher in education (Egok et al., 2021).

One of the learning processes in elementary school is natural science education that must be instilled in students. Natural science means systematically finding out about nature. Not only mastering a combination of knowledge consisting of concepts, facts, or principles, but natural science is also the process of discovering something. Students' hands-on experience (experiments) and understanding of their environment should be the focus of natural science learning in elementary school.

In the 21st century, natural science education focuses on creating methods and solutions to everyday problems. Teachers must understand the importance of applying various forms of cooperation and participation pedagogy to the learning process. This is supported by (Eltiyani & Bengkulu, 2020) which states that education is not only about the curriculum, teachers' learning methods are also very important for student learning achievement. Conventional learning methods cause low student learning activities. When the material is delivered, students tend not to pay attention to the teacher which is additional evidence that the student learning process is still poor.

(Sa'diyah & Wulandari, 2021) stated that learning is a teacher's effort to make learning situations fun and encourage students to be enthusiastic about learning. When choosing a teaching method, teachers must consider the development of students' abilities in accordance with the characteristics of elementary school students.

This is in accordance with the opinion (Cintia et al., 2018) About placing emphasis on student activities and shifting learning responsibilities to students in the learning process is very important so that the learning process can help and facilitate the development of students' potential. So that students can get the learning outcomes that have been determined. One of the outcomes produced during the learning process is called learning outcomes. The definition of learning outcome assessment is the systematic process of collecting, analyzing, and interpreting information to assess whether learning objectives are achieved or not. The results of this assessment produce qualitative and quantitative data called student learning outcomes. (Paramita et al., 2020) states that the level and measure of success after recording and receiving the learning experience achieved by students at school is the definition of learning outcomes.

In fact, natural science learning activities that occurred in grade V of SD Negeri Kleco I Surakarta showed low learning outcomes. It can be seen from the results of the students' daily exams that out of 20 students, only 8 students are able to achieve the minimum completeness criteria of natural science lessons that have been set. This means that only 33.33% of students complete the natural science learning process. This low learning outcome can be seen that in the natural science learning process, learning activities only focus on student books. The concepts of natural science that must be studied are only sourced from the texts in the book, as well as the teacher's explanations. As a result, students only listen without learning activities to find concepts in accordance with the demands of basic competencies. In addition, natural science learning activities are carried out without the use of the right method in conveying concepts and facts from natural science materials (Tri Cahyono et al., 2023).

This problem will certainly affect the learning outcomes of natural sciences continuously if not corrected. It is necessary to improve learning carried out by teachers as an effort to increase professionalism as educators. Efforts that can be chosen by teachers are by utilizing the Outdoor Study method. (Evayani, 2020) revealed that the outdoor learning approach or the usual outdoor

study utilizes outdoor setting facilities. In knowledge management, using nature as a medium in the learning process is considered very effective because it can feel, see, and do it yourself, so that knowledge and experiences derived from nature can be felt, interpreted, and developed according to their own abilities.

The outdoor study method increases children's social and physical activities. Children will be more often involved in activities that indirectly require creativity and cooperation with friends. The same thing was also expressed by (Setiyorini, 2018) which states that learning that is carried out outside the classroom or school is the definition of the Outdoor Study learning method. This method is very important for the development of elementary school students because it can provide students with direct experience with the subject matter, which makes the learning process more meaningful (Suarmika & Faliyandra, 2017).

Based on the problems that have been described, the researcher is interested in carrying out a research entitled "Implementation of the Outdoor Study Method to Improve the Learning Outcomes of Natural Sciences for Class V Students"

## METHODS

This research was carried out at SD Negeri Kleco I Surakarta. This research activity was carried out from April to May 2024. The research subjects consisted of 20 students who had intermediate academic abilities. This research is a class action research that is carried out in cycles. Each cycle consists of planning, implementation, observation, and reflection steps. It is a cycle that the researcher will continue until it is completed. Researchers will continue the first cycle with the same procedure to the second cycle if they find new problems or findings that have not been fully resolved.

The data collection techniques used are observation and test techniques. Observation is direct observation of the learning process and student behavior. Tests are a tool to measure data in a study, one of which is learning outcomes. The main instrument in data collection and measurement is a test, which is a test in the form of a description of 10 questions made based on the skills that students need to master.

This research uses qualitative and quantitative data analysis techniques. For qualitative data descriptions, they can be analyzed using observation sheets, while quantitative descriptions are carried out with tests that have been given. Data collection through tests was carried out to measure the improvement of students' cognitive learning abilities at the end of each cycle.

Average grade percentage:

$$\frac{\text{Total score}}{\text{maximum score}} \times 100\%$$

Next is to calculate the percentage of students who complete or get a score of  $\geq 70$ , using the following formula:

$$\frac{n}{N} \times 100\%$$

If the total score has been found individually, then it is converted into an average. With success criteria:

> 70 = pass and < 70 = do not pass

Table 1.  
Success Criteria

No.	Success Score	Success Rate
1.	85-100	Excellent (A)
2.	70-84	Good (B)
3.	55-69	Enough (C)
4.	40-54	Less (K)
5.	<39	Very Less (E)

If the end of each action has a value of  $\geq 70$ , the improvement of individual learning ability is said to be complete and the improvement of learning ability is classically complete, if 75% of the total number of students complete learning.

## RESULTS AND DISCUSSION

The application of the outdoor study method to improve the learning outcomes of natural sciences for grade V students of SD Negeri Kleco I Surakarta was carried out on the low learning outcomes of students during natural science learning. This improvement activity is an action research activity carried out in 2 cycles that follow the steps of classroom action research. The learning outcomes of students are improved in each cycle as follows:

### 1. Cycle 1 Learning Outcomes

Cycle 1 is carried out based on the learning implementation plan that has been made at the planning stage. The basic competency in cycle 1 is to analyze the influence of heat on temperature changes and the shape of objects in daily life. The results of this study are based on a test given at the end of the cycle to see the learning outcomes of students after the learning process using the Outdoor Study method. The learning outcomes of cycle 1 are as follows:

Table 2.  
Student Learning Outcomes in Cycle 1

NO	STUDENT INITIALS	KKM	VALUE	INFORMATION
1	AUO	70	65	Incomplete
2	BVP	70	80	Complete
3	CWQ	70	85	Complete
4	DXR	70	90	Complete
5	EYS	70	95	Complete
6	FZT	70	65	Incomplete
7	DISTRICT	70	75	Complete
8	HBV	70	50	Incomplete
9	ICW	70	90	Complete
10	JDX	70	95	Complete
11	KEY	70	50	Incomplete
12	LFZ	70	80	Complete

13	MGA	70	70	Complete
14	NHB	70	60	Incomplete
15	OIC	70	70	Complete
16	P.S.	70	80	Complete
17	QKE	70	65	Incomplete
18	RLF	70	90	Complete
19	SMG	70	60	Incomplete
20	TNH	70	80	Complete
Sum			1495	
Grade Point Average			71.67 (Good)	
Percentage of Students Completed			83,33%	
Percentage of Incomplete Students			16,67%	

Table 2 shows the learning outcomes of students using the outdoor study method in natural science learning. From 20 students, the average score data was obtained of 71.67% with a good category. Judging from the completeness of 20 students, there are 13 students or 83.33% who have completed, while 7 students or 16.67% have not reached completeness. Judging from this data, the average score has met the success indicators. The learning outcomes of students in cycle 1 can be described through the following graph of the completeness of learning outcomes.

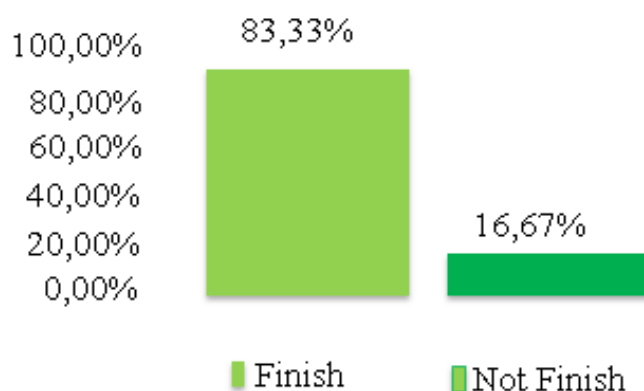


Figure 1.  
Student Learning Outcomes in Cycle 1

However, from the results of the reflection, several obstacles were found that caused the students to not be completed. Reflection with colleagues shows that there are shortcomings in the implementation of cycle 1, namely:

1. The implementation of the outdoor study method has been carried out well in accordance with the existing steps in the learning plan, but the time used exceeds the specified time allocation. In addition, it seems that the teacher is too fast in conveying the learning steps.
2. There are still students who have not focused on implementing experimental activities using the outdoor study method

Based on the reflections obtained, the improvement of cycle 2 learning was carried out with the following efforts:

1. The teacher explained with the steps of the activity slowly which were followed directly by the students. In addition, each step is given a time limit to match the set time allocation

2. The number of groups that were originally 3 people per group was formed into 2 people per group, so that each group member can be responsible and focus on the tasks given.

## 2. Cycle 2 Learning Outcomes

Cycle 2 improvement activities are carried out based on the results of reflection carried out in cycle 2. In this activity, learning improvements are carried out by following the learning implementation plan that has been improved previously. The learning outcomes of students after using the outdoor study method are as follows.

Table 3.  
Student Learning Outcomes in Cycle 2

NO	STUDENT INITIALS	KKM	VALUE	INFORMATION
1	AUO	70	70	Complete
2	BVP	70	80	Complete
3	CWQ	70	85	Complete
4	DXR	70	90	Complete
5	EYS	70	95	Complete
6	FZT	70	70	Complete
7	DISTRICT	70	75	Complete
8	HBV	70	80	Complete
9	ICW	70	90	Complete
10	JDX	70	95	Complete
11	KEY	70	85	Complete
12	LFZ	70	80	Complete
13	MGA	70	70	Complete
14	NHB	70	80	Complete
15	OIC	70	70	Complete
16	P.S.	70	80	Complete
17	QKE	70	85	Complete
18	RLF	70	90	Complete
19	SMG	70	70	Complete
20	TNH	70	80	Complete
Sum			1620	
Grade Point Average			81.00 (Good)	
Percentage of Students Completed			100%	
Percentage of Incomplete Students			0%	

The data in table 3 shows that in cycle 2 there is an increase in student learning outcomes using the outdoor study method. The average score data was obtained of 78.33% with a good category. Judging from the completeness of 20 students, there are 20 students or 100% who are complete, Judging from this data, the average score has met the success indicators. The completeness of the learning outcomes can be seen in the following figure. The results of reflection with colleagues showed that the outdoor study method had been carried out according to the steps in the learning implementation plan, the learning activities were

conducive and in accordance with the time allocation that had been designed. And the improvement of learning outcomes has been in accordance with the specified success indicators. For more clarity, the improvement of natural science learning outcomes in cycle 2 using the outdoor study method can be seen in the following figure.

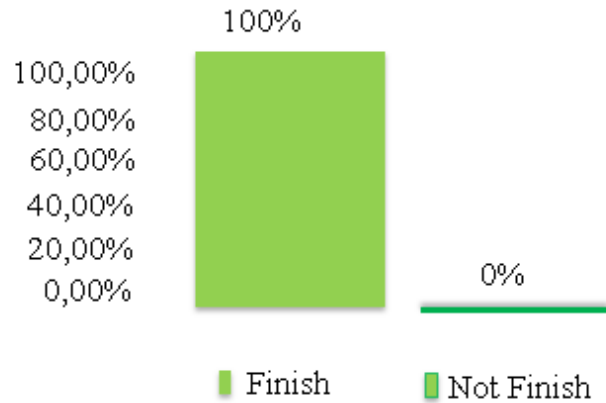


Figure 2.  
Student learning outcomes in cycle 2

This research is based on the low learning outcomes of natural sciences students in grade V of SD Negeri Kleco I Surakarta. So that it is necessary to improve learning in the form of classroom action research. It can be explained that learning natural sciences in elementary school is very important to be carried out because it can build students' curiosity, interest in nature and themselves, and provide opportunities for students to practice scientific methods and communicate them. Natural science learning in elementary school is closely related to curiosity about finding material about natural systematics, so that learning natural science in elementary school can be intended as an invention, not just as a mastery of concepts, principles, and collections of knowledge in the form of facts. Therefore, this learning improvement chose the outdoor study method as an action used in the natural science learning process. By using natural media, the learning process is very effective to increase the knowledge gained because children can directly feel, see, and do something independently. A comparison of the improvement of student learning outcomes in cycle 1 and cycle 2 can be seen in the following figure 3.

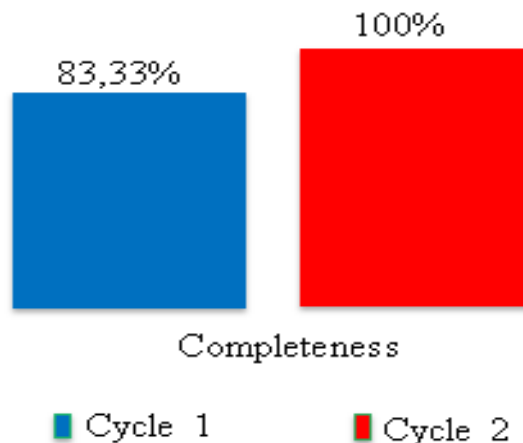


Figure 3.  
Comparison of the Completeness of Student Learning  
Outcomes in Cycle 1 and Cycle 2

The results of the study showed that there was an increase in student learning outcomes. Both the average score obtained and the percentage of completeness. The learning outcomes in cycle 1 were 71.67% with an average score of 71.67% with the Good category and in cycle 2 an average score increase of 78.33% with the Good category. Likewise with the completeness of student learning. There were 5 students or 83.33% who completed in cycle 1 and in cycle 2, 100% of students were obtained. Explanation that one of the standards in measuring the success of the learning process is the definition of learning outcomes. These results show how far students, teachers, learning processes, and educational institutions have come to achieve the learning goals that have been set. The definition of learning outcome assessment is the process of assessing the learning outcomes obtained by students by comparing them through certain criteria or measures.

This success is an indicator that the action used, namely the outdoor study method, is the right action, this method uses the environment as a place for students to learn. Learning outside the classroom is also known as outdoor study learning is a type of learning activity that allows students to experience extraordinary thinking experiences. Learning outside the classroom, or learning outdoors can be a new learning resource that will not make students bored. This statement is supported by the ability of students who state that the outdoor learning method is suitable for improving students' social intelligence skills because children will think more freely, their brains will be more relaxed, and learning will become more concrete and interesting. The method of learning in the open air can also increase student togetherness and solidarity.

The selection of the outdoor study method is also considered an action that is in accordance with the character of students at elementary school age, so that in its implementation it appears that students really like the learning process. Learning in elementary school is not the same as at other levels of education. This is seen from the perspective of student development. It is very important for teachers to understand the learning characteristics of elementary school students so that they can structure learning that pays attention to the level of student development. However, many teachers do not learn by considering aspects of student development. The learning process in elementary school is closely related to direct experience and concrete objects, it is hoped that the environmental approach can make it easier for teachers to carry out learning activities. This is due to the fact that each child has a different way of understanding and adapting to their environment.

The success of the implementation of this learning improvement is also inseparable from the role of teachers in the implementation of natural science learning. Learning activities that are not monotonous make the learning process more directed and well implemented. Learning activities are also more directed to student activities in learning natural sciences or science, so that students better understand the concepts learned. Explanation that teachers as educators need to dive into the world of students, what is the potential in students, what are their interests and talents, what are their motivations for learning, and all characteristics or problems in the learning process.

This research was carried out by conducting careful planning related to the outdoor study method. Starting with determining the basic competencies to be achieved until the implementation of the research. So it is hoped that it will achieve the expected goals. The expression that learning is basically a learning activity designed to help a person learn according to the learning objectives. Therefore, learning is defined as an external situation carried out by educators in learning activities to encourage someone to learn. The expression that if done programmatically well, the learning process is said to be effective so that basic competencies

and learning objectives can be achieved by students and classroom conditions make students during the learning process more active. This certainly makes the learning process better.

## CONCLUSION

Based on the results of the research that has been obtained, it can be concluded that the application of the outdoor study method to improve the learning outcomes of natural sciences students in grade V of SD Negeri Kleco I Surakarta. The learning results in cycle 1 were obtained with an average score of 71.67% with the Good category and in cycle 2 an average increase in scores of 78.33% with the good category. Likewise with the completeness of student learning, in cycle 1 there were 5 students or 83.33% who completed and in cycle 2, 100% of students were obtained.).

## REFERENCES

- Cahyono, B. T., Juwita, R., & Karoso, S. (2024). Management of Direct Instruction Model Implementation to Foster University Student Learning Creativity. *Al-Fikrah: Jurnal Manajemen Pendidikan*, 12(1), 38. <https://doi.org/10.31958/jaf.v12i1.8733>
- Cintia, N. I., Kristin, F., & Anugraheni, I. (2018). PENERAPAN MODEL PEMBELAJARAN DISCOVERY LEARNING UNTUK MENINGKATKAN KEMAMPUAN BERPIKIR KREATIF DAN HASIL BELAJAR SISWA. *Perspektif Ilmu Pendidikan*, 32(1), 67–75. <https://doi.org/10.21009/pip.321.8>
- Egok, A. S., Andeli, A. P., & Sofiarini, A. (2021). Penerapan Model Pembelajaran Outdoor Learning Pada Pembelajaran Tematik Siswa Kelas V Sd Negeri Tanjung Beringin. *Prosiding Seminar Nasional Hasil Riset Dan Pengabdian*, 200–205. <https://snhrp.unipasby.ac.id/prosiding/index.php/snhrp/article/view/192%0Ahttps://snhrp.unipasby.ac.id/prosiding/index.php/snhrp/article/download/192/160>
- Eltiyani, N., & Bengkulu, U. (2020). Penerapan Metode Outdoor Learning Untuk Meningkatkan Aktivitas Dan Prestasi Belajar Siswa Pada Pembelajaran PKN Di Kelas Va SD Negeri 51 Kota Bengkulu Syahril Yusuf Neza Agusdianita. *Juridikdas Jurnal Riset Pendidikan Dasar*, 3(1), 102–108.
- Evayani, N. L. P. (2020). Penerapan Model Pembelajaran Discovery Learning dengan Metode Outdoor Dalam. *Indonesian Journal of Educational Development*, 1(3), 391–400. <https://doi.org/10.5281/zenodo.4284193>
- Paramita, A. A. E. P., Rati, N. W., & Sudatha, I. G. W. (2020). Model Discovery Learning Berbasis Outdoor Study Terhadap Hasil Belajar IPA. *Jurnal Pedagogi Dan Pembelajaran*, 3(2), 175. <https://doi.org/10.23887/jp2.v3i2.25353>
- Sa'diyah, E. C., & Wulandari, F. (2021). Study Literatur Penerapan Metode Outdoor Learning Dalam Meningkatkan Hasil Belajar Kognitif Pada Mata Pelajaran Ipa Di Sekolah Dasar. *Elementeris : Jurnal Ilmiah Pendidikan Dasar Islam*, 3(2), 16. <https://doi.org/10.33474/elementeris.v3i2.10905>
- Setiyorini, N. D. (2018). Pembelajaran Kontekstual Ipa Melalui Outdoor Learning Di Sd Alam Ar-Ridho Semarang. *Journal AL-MUDARRIS*, 1(1), 30. <https://doi.org/10.32478/al-mudarris.v1i1.97>
- Suarmika, P. E., & Faliyandra, F. (2017). Model Kooperatif GI Berbasis Outdoor Study Meningkatkan Aktivitas dan Hasil Belajar IPA SD. *JPDI (Jurnal Pendidikan Dasar Indonesia)*, 1(2), 20. <https://doi.org/10.26737/jpdi.v1i2.261>

Auliantika Selian et al.

Tri Cahyono, B., Prihatin, R., Sukmawati, F., Budhi Santosa, E., & Author Budi Tri Cahyono, C. (2023). Development of Authentic Assessment with Project Based Learning Approach in Primary School Students. *Qalamuna*, 15(1), 539–548. <https://doi.org/10.37680/qalamuna.v15i1.3987>

## **Pedagogical Innovation of Game-Based Learning for 21st Century Skills in Vocational Education: A Systematic Literature Review**

**Elvi Raziana<sup>1</sup>, Hilmawan Wibawanto<sup>2\*</sup>**

<sup>1</sup>Department of Chemistry Education, Universitas Islam Indonesia, Yogyakarta, Indonesia

<sup>2</sup>Department of Education, Universitas Sebelas Maret, Surakarta, Indonesia

E-mail: <sup>1</sup>[razianaelvi@gmail.com](mailto:razianaelvi@gmail.com), <sup>2</sup>[hmawanz0306@student.uns.ac.id](mailto:hmawanz0306@student.uns.ac.id)\*

\*Corresponding Author

*Article History: Received: June 02, 2025; Accepted: June 29, 2025; Published: June 30, 2025*

### **ABSTRACT**

Vocational education faces the demand to equip learners with 21st century skills to cope with the changing job needs. This study aims to comprehensively explore the pedagogical innovation of Game-Based Learning (GBL) in shaping and enhancing such skills in vocational education. Using the Systematic Literature Review (SLR) method, 35 relevant articles were thematically analyzed from the Scopus database. The results showed an increasing trend in the use of GBL, especially serious games and VR simulations used in various vocational sectors such as engineering and health. GBL designs often integrate development models such as ADDIE and Discovery Learning approaches, utilizing interactive game elements for authentic scenarios. GBL is proven to significantly increase learner motivation and engagement. In addition, GBL is effective in developing 21st century skills such as logical thinking, problem solving, cognitive and affective skills, and contributes to improved academic performance. In conclusion, GBL is an effective pedagogical innovation to prepare vocational education graduates with relevant competencies for future job competition.

**Keywords:** *21st Century Skills, Game-Based Learning, GBL, Pedagogical Innovation, Vocational Education*



**Copyright © 2025 The Author(s)**

**This is an open access article under the [CC BY-SA](https://creativecommons.org/licenses/by-sa/4.0/) license.**

### **INTRODUCTION**

The digital age and the Fourth Industrial Revolution (4IR), or Industry 4.0 have brought significant changes in the world of work. These changes require individuals to have more adaptive and interdisciplinary skills that fit the needs of the 21st century. Skills such as critical thinking, problem solving, creativity, collaboration, communication, and digital literacy are essential for success in a dynamic and competitive global job market (Rismana & Hernawati, 2025; Thornhill-Miller et al., 2023). In the context of vocational education, educators bear a great responsibility to equip learners with relevant competencies. The aim is to prepare learners to face challenges while being able to take advantage of opportunities in the future. Therefore, the integration of technology and innovative pedagogical approaches is no longer an option, but a necessity (Hamzah et al., 2024).

The development of 21st century skills has become a widely recognized issue. However, educators and vocational education institutions still face various challenges in implementing them into curricula and learning practices. Teacher-centered and less interactive teaching

methods often fail to facilitate the development of complex soft skills, such as collaboration and problem-solving (Tang, 2023). Field data shows that there is a significant gap between the curriculum offered and the real needs of the industry. Many vocational education institutions face limitations in facilities and availability of industry-experienced instructors, so graduates are often unprepared for the demands of the world of work (Singun, 2025; Wibawanto et al., 2021). In addition, the problem of vocational students' learning motivation often arises, characterized by a lack of enthusiasm and a tendency to get bored easily during the learning process (Hidajat et al., 2020).

The skills gap and low motivation to learn in vocational education can be traced back to several key causes. First, the practice-oriented nature of vocational learning requires immersive and authentic learning environments. However, this is often hindered by limited facilities or difficulties in creating complex and risky real-world scenarios (Qin, 2024). Secondly, the lack of engaging pedagogical approaches and personalized learning can lead to learner boredom and indifference. Monotonous learning environments are also less favorable for stimulating creativity and innovative thinking (Georgopoulou et al., 2024). This situation is exacerbated by the rapid pace of technological change, which makes teaching materials obsolete and demands continuous adaptation of the curriculum to maintain its relevance (Chukwuemeka & Garba, 2024).

It is important to conduct in-depth research on pedagogical innovation in vocational education. The urgency of this research lies in two main reasons. First, to ensure the relevance of vocational graduates to the needs of the labor market, so as to contribute to the reduction of unemployment while increasing competitiveness (Odilovna, 2025). Second, to identify and recommend learning strategies that are proven to be effective and engaging. These strategies are expected to address the challenges of learner motivation and engagement, while systematically developing much-needed 21st century skills. Without proven innovation, vocational education risks falling behind and failing to fulfill its strategic role in national economic development (Aseery, 2023).

In response to these issues, Game-Based Learning (GBL) has emerged as one of the most promising pedagogical innovations. GBL involves the use of games or game elements in an educational context to achieve specific learning objectives (Hartt et al., 2020; Gripl et al., 2020). This solution is important because GBL inherently encourages active engagement, fosters intrinsic motivation, and provides a safe learning environment for exploration and experimentation. Through simulations and challenges presented in games, learners can practice skills in realistic scenarios without significant risk, receive instant feedback, and iteratively develop problem-solving and critical thinking skills (Ghoman et al., 2020).

GBL is theoretically rooted in constructivism theory, which believes that learners actively construct their own knowledge through interactive experiences. In addition, GBL also effectively applies the motivational principles discussed in Self-Determination Theory. This theory emphasizes the importance of autonomy, competence and relatedness as key drivers of intrinsic motivation (Lasala Jr, 2024). The various intrinsic elements in the game, such as clear goals, structured rules, adaptive feedback, and challenges tailored to skill levels, effectively fulfill these psychological needs. Therefore, GBL goes beyond mere information transfer, but rather focuses on developing behaviors and skills through immersive and meaningful learning experiences (Gripl et al., 2020).

The advantages of GBL as a pedagogical innovation are manifold. First, GBL significantly increases learner motivation and engagement thanks to the fun and challenging nature of the game (Nadeem et al., 2023). Second, GBL facilitates the simultaneous development of cognitive and non-cognitive skills, including problem solving, creative thinking, decision making, strategic thinking, collaboration (Wang et al., 2023). Third, GBL provides a safe learning environment to experiment and make mistakes, where failure is considered a natural part of the learning process

rather than an obstacle (Gripl et al., 2020). Fourth, GBL allows personalization and flexible customization of learning to suit each individual's learning pace and style (Chiotaki et al., 2023).

Previous studies have examined the effectiveness of GBL at various levels of education, including higher education and vocational education. For example, a study by Yu et al. (2020) showed that the use of educational games can significantly improve academic achievement and learner engagement in certain subjects. Other research also suggests that game-based simulations are effective in practicing procedural and problem-solving skills in various professional fields (Vázquez-Calatayud et al., 2024). However, the specific application of GBL in vocational education with a focus on developing 21st century skills still require more comprehensive synthesis.

In contrast to many previous literature reviews that tend to focus on the effectiveness of GBL in general or limited to specific disciplines, this study will explicitly synthesize findings on GBL as a pedagogical innovation aimed at developing 21st century skills in the context of vocational education. This study aims to provide a more detailed understanding of the types of GBL, effective pedagogical designs, and how GBL directly contributes to enhancing critical skills such as critical thinking, collaboration, and adaptability among vocational learners. Therefore, the uniqueness of this study lies in the conceptualization of GBL as a systematic pedagogical innovation that specifically targets 21st century skills in the unique and dynamic landscape of vocational education.

Based on the background, problem identification, and research gaps described above, this article will conduct a systematic review to deeply explore the pedagogical innovation of game-based learning for 21st century skills in vocational education. Through this systematic review, this study aims to comprehensively explore how Game-Based Learning serves as an effective pedagogical innovation in shaping and enhancing 21st century skills in the vocational education environment.

## **METHODS**

### *Research Design*

This study used a Systematic Literature Review (SLR) approach to comprehensively analyze the scientific literature on Game-Based Learning (GBL) pedagogical innovations in developing 21st century skills at the vocational education level. SLR was chosen because it enables the identification, evaluation, and synthesis of relevant evidence in a systematic, transparent, and replicable manner, thereby minimizing bias and increasing the validity of findings. This study aims to identify recent trends, patterns of findings and research gaps related to the application of GBL to equip vocational learners with essential skills relevant to the demands of today's world of work. A systematic review of selected academic articles was conducted, emphasizing thematic analysis of the design, implementation, and impact of GBL on 21st century skills development.

### *Participants and Data Sources*

The data sources in this study came from 35 scientific articles focusing on Game-Based Learning in vocational education. These articles include publications in scopus-indexed international journals and proceedings. The process of obtaining articles was done through a systematic search using a combination of relevant keywords, such as: "game-based learning", "vocational education", "vocational training", "21st-century skills". Articles were selected from countries with diverse vocational system backgrounds, reflecting the diversity of GBL implementation contexts. The inclusion criteria applied included: (1) articles that addressed vocational education; (2) articles that focused on the use or analysis of Game-Based Learning or educational games; and (3) articles that explicitly examined the development of 21st century skills as a learning outcome or impact of GBL implementation.

### Analysis Procedure

Data analysis was conducted systematically with a qualitative thematic approach, following the general stages in SLR. The process began with the identification and collection of articles through a predetermined keyword search. Thereafter, articles were rigorously screened based on title, abstract, and then full content to assess eligibility and relevance to the research topic. Articles that did not meet the inclusion criteria were excluded from the review. After the selection stage, articles that met the criteria were entered into a structured data extraction sheet.

The analysis process was conducted using open coding techniques to identify initial concepts and categories, followed by axial coding to establish relationships between categories. Data that had been extracted and coded were then analyzed through the stages of data reduction, data presentation in the form of a matrix or thematic narrative, and conclusion drawing. Synthesis was conducted to assess emerging patterns, differences in findings, and the unique contribution of each article to the understanding of the impact of GBL pedagogical innovations on the development of 21st century skills. The 21st century skills that were the focus of the analysis included, but were not limited to, critical thinking, problem solving, creativity, innovation, collaboration, communication, and digital literacy. The results of this study were then used to formulate conceptual conclusions, implications, and recommendations.

## RESULTS AND DISCUSSION

### Results

The results of a systematic review of 35 articles from 2020 to 2025 show that the Game-Based Learning (GBL) approach in vocational education continues to develop significantly, both in terms of pedagogical approaches, vocational sectors touched, and targeted 21st century skills. The variety of approaches used include role-playing games (RPG), virtual reality (VR), gamification, interactive narratives, and escape rooms, with the main goal of encouraging active participation, motivation to learn, and the formation of essential social and professional skills.

Emerging trends show that most GBL studies in vocational education focus on strengthening skills such as collaboration, problem solving, critical thinking, communication, and digital literacy. Reported impacts include increased learning motivation, learner engagement, effective learning of complex concepts, and personalization of learning pathways based on individual interests and needs. Table 1 shows a summary of the main findings from the key articles.

*Table 1. Findings of Game-based Learning in Vocational Education (2020-2025)*

No	Source	GBL Type/ Approach	Vocational Sector	21 <sup>st</sup> Century Skills	Key Impacts/Key Findings
1	Zuo et al. (2025)	Theoretical Games	Entrepreneurs hip	Innovation, Strategy	Strategy adaptation, innovation reinforcement
2	Liu & Zheng (2025)	Evolutionary Game	Elderly Care	Collaboration, Risk Management	Subsidies boost school- industry cooperation
3	Fang (2024)	AI Game Simulation	Engineering	R&D, Collaboration	Incentives and supervision improve R&D quality
4	Yu & Abdullah (2025)	Listening Game	English	Motivation, Language Literacy	Improving motivation & listening skills
5	Gutierrez et al. (2025)	Interactive Narrative + AI	Career Guidance	Self-Reflection, Career Interests	Participant responses relevant to academic strengths

No	Source	GBL Type/ Approach	Vocational Sector	21 <sup>st</sup> Century Skills	Key Impacts/Key Findings
6	Ahmadian et al. (2024)	Digital Game	English	Empathy, Literacy	Gender affects meaning and response to games
7	Widjajanti et al. (2024)	Math RPG	Math	Motivation, Self-Discipline	RPGs are valid and effective in increasing motivation to learn
8	Arianti et al. (2024)	RPG + Discovery	Programming	Logical Thinking	Positive response games, integration of discovery learning model
9	Boel et al. (2023)	VR Games	Safety	Risk Perception	Low-cost VR effective in improving safety understanding
10	Lochbühler et al. (2024)	Game Usage Survey	General	Digital Literacy, Social Balance	Tendency to overuse social media and games
11	Dahalan et al. (2023)	SLR GBL & Gamification	Multisector	Critical, Collaborative	Increasing trend in Asia, dominated by engineering & healthcare
12	Li & Wu (2024)	Game Equilibrium Model	Regional Economy	Cooperation, Strategy	School-industry synergy influenced by fiscal incentives
13	Koivisto et al. (2023)	VR Escape Game	Rehabilitation	Life Skills	Effective for youth self-management training
14	Göbel et al. (2024)	Serious Game	Technician	Problem Solving	Use of SG4BB for cardboard technician training
15	Jiang (2023)	Game Equilibrium	Vocational University	Learning Enthusiasm	Split equilibrium model effective in mobilizing learning motivation
16	Huang (2022)	Mobile Pervasive Game	Field Observation	Reflection, Technology Literacy	Digital experience improves learning performance
17	Wu et al. (2023)	Multi-Player Game	Vocational Governance	Collaboration, Decision- Making	Government strategy determines the direction of vocationalization.
18	Peng et al. (2023)	Land Game	Local Culture	Cultural Literacy	Promotion of local culture through game design & education
19	Amran (2023)	Online Ball Game	Physical Education	Physical Activity, Collaboration	Effective learning media improves student learning outcomes
20	Yang et al. (2022)	Game Addiction Survey	General	Self-Identity, Emotion Regulation	POGU is associated with low self-esteem
21	Jhan et al. (2022)	Digital SCM Game	Supply Chain	Decision Making	GBL uncovers gendered learning pathways
22	Rotter et al. (2022)	Metadata Platform	Multivocational	Critical, Personal Learning	Occupational metadata-based SG matching system
23	Boel et al. (2022)	SAVR - VR Game	Vocational Engineering	Hazard Perception	Positive evaluations for VR as a safety training tool

No	Source	GBL Type/ Approach	Vocational Sector	21 <sup>st</sup> Century Skills	Key Impacts/Key Findings
24	Lei & Cardoso (2022)	Serious Games	Disability	Inclusion, Collaboration	Stakeholder support for inclusive games increases
25	Mardi et al. (2022)	Monopoly Game	Accounting	Motivation, Discipline	GBL increases learner motivation in basic subjects
26	Azizan et al. (2021)	Automotive GBL	Automotive AC	Cognitive, Affective	Game-based module produces higher results than conventional methods
27	Jing & Mingming (2021)	Online Game	General	Self-learning, Discipline, Autonomy	Online games can support or disrupt learning
28	North et al. (2021)	GBL Platform	Multivocational	Instructional Innovation	Platform helps teachers access & customize GBLs
29	Elmunyah et al. (2021)	Degrad Game	Graphic Design	Visual Creativity	Game aids understanding of color & basic design concepts
30	Dochtsi et al. (2020)	Escape Room Logic Game	Electronics	Problem Solving	Digital logic games help understand logic gates
31	Hesse et al. (2021)	Digital Professions Game	Digital Professions	Career Literacy	Game supports understanding of digital work fields
32	Cárdenas-Moncada et al. (2021)	Kahoot	EFL	Cognitive, Communication	Response-based GBL improves outcomes & motivation
33	Larasati et al. (2020)	Logic Game	Algorithms	Basic Logic	Helps non-IT people understand basic algorithms
34	Ratu et al. (2020)	Conflict Resolution Game	General Vocational	Social-Emotional	GBL helps instill a culture of peace in vocational settings
35	Kotsifakos et al. (2019)	Online Digital Logic Game	Electronics	Logic, System Understanding	Game helps understand logic gates and digital systems

### Discussion

Research findings confirm that the integration of GBL in vocational education not only encourages more active and contextualized learning engagement, but also reinforces the hypothesis that experiential approaches and interactivity play a major role in shaping essential 21st century competencies (Dahalan et al., 2023). Various studies show that GBL is able to present complex material in a fun and meaningful way, and facilitate problem-based learning and reflection, as seen in the “Pass Your Limit” study (Widjajanti et al., 2024) and the discovery learning-based RPG game for basic programming (Arianti et al., 2024). In line with this opinion, simulation-based multimedia in vocational education has also proven effective in improving students' skills in practical learning (Wibawanto et al., 2022a).

This discussion also shows coherence with social constructivism theory which states that meaningful learning occurs through active interaction with context and experience (Gutierrez et al., 2025). For example, the use of interactive narratives for real-time assessment of vocational

interests can improve the match between career choices and learners' academic strengths, reinforcing the principle of personalization in education (Gutierrez et al., 2025).

On the other hand, there are some important caveats that point to conceptual and practical challenges. One is the tendency to under-represent metacognitive and self-regulation skills in game design, which is reflected in the lack of critical reflection measurement or training in most studies. In addition, some studies have noted a gender gap in gaming experiences in vocational classrooms, such as in the *Adventures with Anxiety* study, where perceptions of games differed between male- and female-dominated classes (Ahmadian et al., 2024).

The results of this study enrich the literature and improve the results of previous studies that still focus on cognitive aspects only. GBL now targets not only material comprehension, but also professional identity development and emotion management of vocational learners (Yu & Abdullah, 2025; Koivisto et al., 2023). In addition, the integration of technologies such as VR and AI further expands the potential of GBL in creating immersive and contextualized learning experiences (Boel et al., 2023; Fang, 2024).

The theoretical implications of this study indicate the importance of developing a learning design model that explicitly integrates GBL elements with 21st century skills scaffolding strategies. In terms of application, the results emphasize the urgency of training vocational teachers in designing and integrating game media pedagogically, not just technologically. The effectiveness of multimedia-based learning in vocational education, such as in improving participants' practical skills, can illustrate the pedagogical value of technology-enhanced practical simulations (Wibawanto et al., 2022b).

Future research directions include developing a game-based 21st century skills evaluation framework, long-term effectiveness testing, and exploring the potential of GBL for cross-cultural and inclusive learning, as is being pursued in GBL research for learners with special needs (Lei & Cardoso, 2022).

Overall, it can be concluded that GBL in vocational education shows strong potential as a pedagogical innovation that can bridge the gap between the world of education and the world of work. By paying attention to context, learner diversity, and integration with the curriculum, GBL can be a relevant strategy to produce vocational graduates who are adaptive, collaborative, and ready to face challenges in the 21st century.

## **CONCLUSION**

The research concluded that Game-Based Learning (GBL) in vocational education has proven to be an effective pedagogical approach in supporting the development of 21st century skills, especially in the aspects of motivation, collaboration, critical thinking, and problem solving. The analyzed studies show that GBL not only enriches conventional learning methods, but also brings innovation by integrating interactive technologies such as VR, AI, and narrative games to create a more personalized, contextual, and reflective learning experience. This conclusion supports the hypothesis that GBL has the potential as an innovative solution to address the challenges of relevance of vocational education to the changing needs of the world of work.

Practically, the findings provide new directions for educators, curriculum developers and policy makers to strengthen the vocational learning ecosystem through the integration of pedagogically designed GBL. Investments in teacher training, adaptive platform development, and collaboration with industry are needed to ensure the sustainability and effectiveness of GBL implementation. Further research also needs to be directed towards developing models to evaluate the impact of GBL on cross-disciplinary competency formation, as well as testing its effectiveness in the long term and in more diverse contexts.

## CONFLICT OF INTEREST

There is no conflict of interest regarding the publication of this article.

## ACKNOWLEDGEMENTS

The authors would like to express their sincere gratitude to the supervisors, reviewers, and academic colleagues who provided valuable feedback throughout the development of this systematic literature review. This work is part of an academic collaboration aimed at enhancing pedagogical strategies in vocational education.

## REFERENCES

- Ahmadian, S., Brevik, L. M., & Öhrn, E. (2024). Adventures with Anxiety: Gender bias in using a digital game for teaching vocational English. *Journal of Computer Assisted Learning*, 40(6), 2715–2734. <https://doi.org/10.1111/jcal.13006>
- Amran, A. (2023). Desarrollo de medios de aprendizaje para un gran juego de pelota basado en el aprendizaje en línea para estudiantes de secundaria vocacional de clase XI: viabilidad y eficacia (Developing Learning Media for an Online Learning-Based Big Ball Game at Class XI Vocational High School Students: Feasibility and Efficacy). *Retos*, 50, 724–736. <https://doi.org/10.47197/retos.v50.99235>
- Arianti, A. S., Pamungkas, G. Z., Hambali, Y. A., Anisyah, A., & Supiadi, O. A. (2024). Designing Rpg-Based Education Game with Discovery Learning Model for Vocational High School. *Journal of Engineering Science and Technology*, 19(3), 911-925.
- Aseery, A. (2023). Enhancing learners' motivation and engagement in religious education classes at elementary levels. *British Journal of Religious Education*, 46(1), 43–58. <https://doi.org/10.1080/01416200.2023.2256487>
- Azizan, I. D., Alias, M., & Mustafa, M. Z. (2021). Effect of Game-Based Learning in Vehicle Air-Conditioning Course on Cognitive and Affective Skills of Vocational Students. *Journal of Technical Education and Training*, 13(3). <https://doi.org/10.30880/jtet.2021.13.03.014>
- Boel, C., Rotsaert, T., Valcke, M., Vanhulsel, A., & Schellens, T. (2023). Applying educational design research to develop a low-cost, mobile immersive virtual reality serious game teaching safety in secondary vocational education. *Education and Information Technologies*, 29(7), 8609–8646. <https://doi.org/10.1007/s10639-023-12126-4>
- Boel, C., Rotsaert, T., Vleeschouwer, N., Valcke, M., Struyf, D., & Schellens, T. (2022). SAVR – Design and Evaluation of an Immersive Virtual Reality Serious Game on Hazard Perception in Technical and Vocational Education. In *2022 8th International Conference of the Immersive Learning Research Network (iLRN)*. 1–5. <https://doi.org/10.23919/ilrn55037.2022.9815899>
- Cárdenas-Moncada, C., Véliz-Campos, M., & Véliz, L. (2021). Game-based student response systems: The impact of Kahoot in a Chilean vocational higher education EFL classroom. *CALL-EJ*, 21(1), 64-78.
- Chiotaki, D., Pouloupoulos, V., & Karpouzis, K. (2023). Adaptive game-based learning in education: a systematic review. *Frontiers in Computer Science*, 5. <https://doi.org/10.3389/fcomp.2023.1062350>
- Chukwuemeka, E. J., & Garba, M. (2024). Technology as a catalyst for learning and unlearning: A tool for navigating education in a dynamic society. *European Journal of Interactive Multimedia and Education*, 5(2), e02404. <https://doi.org/10.30935/ejimed/15640>
- Dahalan, F., Alias, N., & Shaharom, M. S. N. (2023). Gamification and Game Based Learning for Vocational Education and Training: A Systematic Literature Review. *Education and Information Technologies*, 29(2), 1279–1317. <https://doi.org/10.1007/s10639-022-11548-w>

- Dochtsi, E. R., Kotsifakos, D., & Douligeris, C. (2020). An Escape Room Game for Learning Digital Electronics in Vocational Education and Training (VET). *In Advances in Intelligent Systems and Computing*. 664–674. [https://doi.org/10.1007/978-3-030-49932-7\\_62](https://doi.org/10.1007/978-3-030-49932-7_62)
- Elmunsyah, H., Herwanto, H. W., Smaragdina, A. A., Anggraini, N. S., & Utomo, W. M. (2021). DEGRAF Educational Game as a Supplement for Basic Graphic Design Subjects for Vocational High School Students. *In 2021 7th International Conference on Electrical, Electronics and Information Engineering (ICEEIE)*, 128–132. <https://doi.org/10.1109/iceeie52663.2021.9616829>
- Fang, W. (2024). Evolutionary Game Analysis of Universities and Enterprises in Empowering Vocational Education with Artificial Intelligence. *In Proceedings of the 2024 8th International Conference on Computer Science and Artificial Intelligence* (pp. 456–465). ACM. <https://doi.org/10.1145/3709026.3709108>
- Georgopoulou, M. S., Troussas, C., Sgouropoulou, C., & Voyiatzis, I. (2024). Technology is not Enough: Educators as Catalysts for Sparking Student Interest and Engagement in Higher Education. *In Lecture Notes in Networks and Systems*, 357–368. [https://doi.org/10.1007/978-3-031-73344-4\\_30](https://doi.org/10.1007/978-3-031-73344-4_30)
- Ghoman, S. K., Patel, S. D., Cutumisu, M., et al. (2020). Serious games, a game changer in teaching neonatal resuscitation? A review. *Archives of Disease in Childhood - Fetal and Neonatal Edition*, 2020(105), 98-107.
- Göbel, S., Rotter, E., Brabänder, W., Maier, A., & Ziegler, B. (2024). Serious Games for Vocational Training. *European Conference on Games Based Learning*, 18(1), 297–303. <https://doi.org/10.34190/ecgbl.18.1.2710>
- Greipl, S., Moeller, K., & Ninaus, M. (2020). Potential and limits of game-based learning. *International Journal of Technology Enhanced Learning*, 12(4), 363. <https://doi.org/10.1504/ijtel.2020.110047>
- Gutierrez, R., Navarro, A. M., Villegas-Ch, W., & Mera-Navarrete, A. (2025). The Use of Interactive Narratives in Educational Games to Assess Vocational Interests: An Application of the RIASEC Test Integrated with OpenAI. *IEEE Transactions on Learning Technologies*, 1–13. <https://doi.org/10.1109/tlt.2025.3579226>
- Hamzah, F., Abdullah, A., H., & Ma, W. (2024). Advancing Education through Technology Integration, Innovative Pedagogies and Emerging Trends: A Systematic Literature Review. *Journal of Advanced Research in Applied Sciences and Engineering Technology*, 41(1), 44–63. <https://doi.org/10.37934/araset.41.1.4463>
- Hartt, M., Hosseini, H., & Mostafapour, M. (2020). Game On: Exploring the Effectiveness of Game-based Learning. *Planning Practice & Research*, 35(5), 589–604. <https://doi.org/10.1080/02697459.2020.1778859>
- Hesse, B., Jellinghaus, A., & Ben, E. R. (2021). Serious games for vocational orientation in digital working environments. *Lecture Notes in Informatics (LNI), Proceedings - Series of the Gesellschaft für Informatik (GI)*, P-316, 151-156.
- Hidajat, H. G., Hanurawan, F., Chusniyah, T., & Rahmawati, H. (2020). Why I'm Bored in Learning? Exploration of Students' Academic Motivation. *International Journal of Instruction*, 13(3), 119–136. <https://doi.org/10.29333/iji.2020.1339a>
- Huang, Y. (2022). The effectiveness of mobile learning strategies based on pervasive animated games: an example in a vocational technology college. *Library Hi Tech*, 41(5), 1545–1570. <https://doi.org/10.1108/lht-09-2021-0336>
- Jhan, Y.-C., Luarn, P., & Lin, H.-W. (2022). Individual Differences in Digital Game-Based Supply Chains Management Learning: Evidence from Higher Vocational Education in Taiwan. *Sustainability*, 14(8), 4614. <https://doi.org/10.3390/su14084614>
- Jiang, W. (2023). Research on the synergistic development and operation mechanism of vocational education and innovative development concepts in universities based on a

- separate equilibrium game model. *Applied Mathematics and Nonlinear Sciences*, 9(1). <https://doi.org/10.2478/amns.2023.2.00731>
- Jing, F., & Mingming, T. (2021). Discussion on the Improvement of Online Learning Ability of Higher Vocational College Students by Online Games and the Existing Problems. *Journal of Physics: Conference Series*, 1915(4), 042054. <https://doi.org/10.1088/1742-6596/1915/4/042054>
- Koivisto, J.-M., Nykänen, K., Kuuluvainen, S., Maunula, J., Kauhanen, E., Varjonen, K., Jumisko-Pyykkö, S., Koskela, K., & Romppanen, T. (2023). Designing and developing a virtual reality escape game for youth vocational rehabilitation. *International Social Work*, 67(1), 66–85. <https://doi.org/10.1177/00208728221143653>
- Kotsifakos, D., Petrakis, G., Stavrou, M., & Douligeris, C. (2019). An Online Game for the Digital Electronics Course for Vocational Education and Training (VET) Students. *In Advances in Intelligent Systems and Computing*, 638–649. [https://doi.org/10.1007/978-3-030-11932-4\\_60](https://doi.org/10.1007/978-3-030-11932-4_60)
- Larasati, A., Prabawa, H., & Kusnendar, J. (2020). Logic and Computer Educational Game for non-IT Vocational Students. *In Proceedings of the Proceedings of the 7th Mathematics, Science, and Computer Science Education International Seminar*. <https://doi.org/10.4108/eai.12-10-2019.2296510>
- Lasala Jr, N. L. (2024). STUDENTS' INTRINSIC MOTIVATION USING GAME-BASED ACTIVITIES. *Dalat University Journal of Science*, 50–70. [https://doi.org/10.37569/dalatuniversity.14.2.1161\(2024\)](https://doi.org/10.37569/dalatuniversity.14.2.1161(2024))
- Lei, C. O., & Cardoso, J. C. S. (2022). Understanding Stakeholders' Perspectives Towards Serious Games for Vocational Training for People with Intellectual Disabilities in Macau. *In Lecture Notes in Computer Science*, 320–330. [https://doi.org/10.1007/978-3-031-20212-4\\_26](https://doi.org/10.1007/978-3-031-20212-4_26)
- Li, J., & Wu, Y. (2024). Exploring the synergistic development strategy of vocational education and regional economy based on the separating equilibrium game model. *Applied Mathematics and Nonlinear Sciences*, 9(1). <https://doi.org/10.2478/amns-2024-0977>
- Liu, B., & Zheng, Z. (2025). Three Party Evolutionary Game Relationship and Model of Vocational Education for Elderly Care Professionals in a Deep Aging Society. *In Advances in Transdisciplinary Engineering*. <https://doi.org/10.3233/atde250148>
- Lochbühler, K., Rossa, M., Ebert, C., Morgenstern, M., Arnaud, N., & Kraus, L. (2024). Substanzkonsum und Nutzung von sozialen Medien, Computerspielen und Glücksspielen unter Auszubildenden an beruflichen Schulen. *Bundesgesundheitsblatt, Gesundheitsforschung, Gesundheitsschutz*, 67(4), 465–474. <https://doi.org/10.1007/s00103-024-03854-0>
- Mardi, M., Handarini, D., Mulyani, H., & Susilowati, N. (2022). The Application of Monopoly Game Learning Media in Increasing Student Motivation in Learning Basic of Accounting in Vocational School. *Educational Administration: Theory and Practice*, 28(1), 104-120.
- Nadeem, M., Oroszlanova, M., & Farag, W. (2023). Effect of Digital Game-Based Learning on Student Engagement and Motivation. *Computers*, 12(9), 177. <https://doi.org/10.3390/computers12090177>
- North, B., Diab, M., Lameris, P., Zraik, J., Philippe, S., Muller, J., & Fischer, H. (2021). Developing a Platform for using Game-Based Learning in Vocational Education and Training. *In 2021 IEEE Global Engineering Education Conference (EDUCON)*, 1345–1352. <https://doi.org/10.1109/educon46332.2021.9454124>
- Odilovna, O. F. (2025). Factors Affecting the Increase of Professional Skills of Vocational Education Graduates. *Academia Open*, 10(2). <https://doi.org/10.21070/acopen.10.2025.10662>

- Peng, L.-H., Cheng, A. B., & Siswanto, I. (2023). Using innovative technology and land game in vocational education design to revive the Kaxabu's tribal culture. *In AIP Conference Proceedings*, 2714, 020017. <https://doi.org/10.1063/5.0129310>
- Qin, C. (2024). Paths and Strategies for Cultivating Students' Practical Abilities in Vocational Education. *International Journal of Educational Teaching and Research*, 1(2). <https://doi.org/10.70767/ijetr.v1i2.302>
- Ratu, B., Yusuf, S., Maftuh, B., Ilfiandra, & Amirullah, M. (2020). Conflict Resolution Based on Games for Developing a Peace Culture in Vocational High Schools. *Journal of Physics: Conference Series*, 1477(4), 042073. <https://doi.org/10.1088/1742-6596/1477/4/042073>
- Rismana, N., & Hernawati, S. (2025). Pengembangan Kurikulum di Indonesia Dalam Menghadapi Tuntutan Abad Ke-21. *Al-I'tibar: Jurnal Pendidikan Islam*, 12(1), 01–08. <https://doi.org/10.30599/sxrd6x96>
- Rotter, E., Achenbach, P., Ziegler, B., & Göbel, S. (2022). Finding Appropriate Serious Games in Vocational Education and Training: A Conceptual Approach. *Proceedings of the European Conference on Games-based Learning, 2022*, 473-481.
- Singun, A. (2025). Unveiling the barriers to digital transformation in higher education institutions: a systematic literature review. *Discover Education*, 4(1). <https://doi.org/10.1007/s44217-025-00430-9>
- Tang, K. H. D. (2023). Student-centered Approach in Teaching and Learning: What Does It Really Mean? *Acta Pedagogica Asiana*, 2(2), 72–83. <https://doi.org/10.53623/apga.v2i2.218>
- Thornhill-Miller, B., Camarda, A., Mercier, M., Burkhardt, J.-M., Morisseau, T., Bourgeois-Bougrine, S., Vinchon, F., El Hayek, S., Augereau-Landais, M., Mourey, F., Feybesse, C., Sundquist, D., & Lubart, T. (2023). Creativity, Critical Thinking, Communication, and Collaboration: Assessment, Certification, and Promotion of 21st Century Skills for the Future of Work and Education. *Journal of Intelligence*, 11(3), 54. <https://doi.org/10.3390/jintelligence11030054>
- Vázquez-Calatayud, M., García-García, R., Regaira-Martínez, E., & Gómez-Urquiza, J. (2024). Real-world and game-based learning to enhance decision-making. *Nurse Education Today*, 140, 106276. <https://doi.org/10.1016/j.nedt.2024.106276>
- Wang, X., Cheng, M., & Li, X. (2023). Teaching and Learning Computational Thinking Through Game-Based Learning: A Systematic Review. *Journal of Educational Computing Research*, 61(7), 1505–1536. <https://doi.org/10.1177/07356331231180951>
- Wibawanto, H., Roemintoyo, & Rejekiningsih, T. (2022a). Development of simulation-based multimedia for online practicum of land measurement techniques at vocational high school. *In AIP Conference Proceedings*, 2597, 050010. <https://doi.org/10.1063/5.0102428>
- Wibawanto, H., Roemintoyo, & Rejekiningsih, T. (2022b). Simulation-based interactive multimedia to improve vocational students' learning outcomes. *World Journal on Educational Technology: Current Issues*, 14(6), 1927–1942. <https://doi.org/10.18844/wjet.v14i6.8363>
- Wibawanto, H., Roemintoyo, R., & Rejekiningsih, T. (2021). Indonesian Vocational High School Readiness Toward Society 5.0. *Journal of Education Research and Evaluation*, 5(1), 24. <https://doi.org/10.23887/jere.v5i1.31567>
- Widjajanti, K., Sarosa, M., Selviana, V., & Maryanty, Y. (2024). "PASS YOUR LIMIT": Development of game-based learning as an effort to enhance vocational school students motivation in learning of limit. *In AIP Conference Proceedings*, 3235, 030008. <https://doi.org/10.1063/5.0234383>
- Wu, M., Li, D., & Teng, W. (2023). The Multi-Player Evolutionary Game Analysis for the Development of Vocational Education. *E3S Web of Conferences*, 409, 02006. <https://doi.org/10.1051/e3sconf/202340902006>

- Yang, L., Chen, Y., Zhang, M., & Zhang, J. (2022). Pathological online game use of secondary vocational school students: Current situation and its relation to self-esteem and self-identity. *Frontiers in Psychiatry*, *13*. <https://doi.org/10.3389/fpsy.2022.937841>
- Yu, J., & Abdullah, R. (2025). Motivating Left-Behind Vocational Students in English Learning through Game-Based Listening Activities: The Interaction between Self-Esteem and Listening Comprehension Skills. *Forum for Linguistic Studies*, *7*(1). <https://doi.org/10.30564/fls.v7i1.7509>
- Yu, Z., Gao, M., & Wang, L. (2020). The Effect of Educational Games on Learning Outcomes, Student Motivation, Engagement and Satisfaction. *Journal of Educational Computing Research*, *59*(3), 522–546. <https://doi.org/10.1177/0735633120969214>
- Zuo, H., Zhang, M., & Huang, W. (2025). Lifelong learning in vocational education: A game-theoretical exploration of innovation, entrepreneurial spirit, and strategic challenges. *Journal of Innovation & Knowledge*, *10*(3), 100694. <https://doi.org/10.1016/j.jik.2025.100694>

## A Historical Review of Educational Technology: Evolving Definitions and Milestones (1970–2024)

Ahmed Abdi Mohamed<sup>1</sup>, Auliantika Selian<sup>2</sup>

<sup>1</sup> Master of Educational Technology, Affiliation/ Universitas Sebelas Maret, Surakarta, Indonesia

<sup>2</sup> Master of Education, Affiliation/ Albukhary International University, Alor Setar, Malaysia

E-mail: <sup>1</sup>[ahmedabdim87@gmail.com](mailto:ahmedabdim87@gmail.com), <sup>2</sup>[auliantika.selian.student.aiu.edu.my](mailto:auliantika.selian.student.aiu.edu.my)\*

\*Corresponding Author

*Article History: Received: August 05, 2024; Accepted: June 29, 2025; Published: June 30, 2025*

### ABSTRACT

This study provides a comprehensive historical analysis of educational technology from 1970 to 2024, highlighting significant transformations driven by technological advancements and evolving pedagogical paradigms. In the present study, the systematic literature review focuses on the evolution of definitions of educational technology and the identification of milestones. The study offers insights for educators, researchers, and policymakers in shaping future educational technology practices. It evolved over the years to encompass technology, media, communication, and learning systems, as well as systems approaches to instruction. Some of the major developments include the use of audio-visual aids in the 1970s, the use of personal computers in the 1980s, the use of internet and Learning Management Systems in the 1990s and the use of virtual reality, augmented reality and artificial intelligence in the 21st century. These developments show the advancement in educational technology and the impact it can have on the learning process.

**Keywords:** *Educational Technology, Definitions, Developments Evolution, Virtual Reality, Artificial Intelligence*



Copyright © 2025 The Author(s)

This is an open access article under the [CC BY-SA](https://creativecommons.org/licenses/by-sa/4.0/) license.

### INTRODUCTION

The area of educational technology has undergone major changes from 1970 to 2024 due to the development of technologies and changes in paradigms. The very term 'educational technology' has been defined many a time to accommodate the changes in educational practices, learning theories, and the use of new technologies. However, over the decades, this definition broadened to include more holistic approaches that incorporate technology, media, and other forms of learning environments and instructional systems that seek to improve the learning process (Garrison & Vaughan, 2008).

The advancement of educational technology has solved many issues and created opportunities in the educational environment. While in the 1970s the approach was to integrate media into the teaching process as an addition to the traditional methods, in the 1990s with the appearance of the internet and personal computers, the emphasis was made on the creation of an interactive and student-centered environment (Reiser & Dempsey, 2017). Modern educational technology includes such tools and approaches as learning management systems, virtual reality, and artificial intelligence to support individualized and effective learning processes (Selwyn, 2020). This historical analysis shows how definitions and advancements in

educational technology have evolved to meet the needs of educators and learners and how they have improved the educational experience over time (Abbas et al., 2021).

The history and evolution of educational technology are as follows: every advancement in technology has led to new definitions and uses of technology in education. The early educational technologies were mainly concerned with media and audiovisual teaching aids, but with the advent of digital tools and learning environments, the concept of educational technology expanded considerably. This is a continuous process that shows a cycle of evolution where the new technologies require new definitions and frameworks to capture the new roles of technology in education (An, & Oliver, 2021; Li, 2023). However, this continuous evolution presents several challenges. One major issue is the need for ongoing professional development for educators to stay abreast of new tools and methodologies. Teachers and administrators must continuously update their skills to effectively integrate these technologies into their teaching practices (Koehler & Mishra, 2009). Moreover, the rapid pace of technological change makes it difficult to ensure the sustainability and scalability of educational technology initiatives, necessitating careful planning and resource allocation to maximize their impact (Hartley et al., 2010). To provide fruitful results this study will follow these questions:

1. How have the definitions of educational technology changed over time?
2. What are the key milestones of educational technology during the development evolution?

The definitions of educational technology have evolved significantly from 1970 to 2024, reflecting advancements in technology and shifts in educational paradigms. In the 1970s, educational technology was often defined narrowly as the use of media produced by the communication revolution, including tools such as television, films, overhead projectors, and early computers. This era emphasized the integration of these media into traditional teaching environments alongside teachers and textbooks. For example, the 1970 definition by the Commission on Instructional Technology highlighted two main approaches: one focused on the media themselves and the other on the systematic design and evaluation of learning processes using these media (Commission on Instructional Technology, 1970).

By the 1990s and early 2000s, the definitions began to incorporate more sophisticated understandings of the role of technology in education. The 1994 definition by Seels and Richey expanded the scope to include the theory and practice of design, development, utilization, management, and evaluation of processes and resources for learning. This reflected a shift towards viewing educational technology not just as tools but as a field encompassing a broad range of activities aimed at improving learning outcomes. By 2004, the Association for Educational Communications and Technology (AECT) further refined the definition to include the ethical practice of facilitating learning and improving performance through the creation, use, and management of technological processes and resources. This definition underscored the importance of ethical considerations and the broader impact of technology on educational practices (AECT, 2004).

Despite the advancements, significant challenges have persisted. The need for continuous professional development for educators to keep pace with rapid technological changes is a major issue. Educators require ongoing training to effectively integrate new technologies into their teaching. Furthermore, the digital divide remains a critical challenge, as unequal access to technology exacerbates existing educational inequalities. Ensuring the sustainability and scalability of educational technology initiatives also requires careful planning and resource allocation. Addressing these challenges is essential for maximizing the potential benefits of educational technology in enhancing learning outcomes (Reiser & Dempsey, 2017; Koehler & Mishra, 2009; Selwyn, 2020; Hartley et al., 2010).

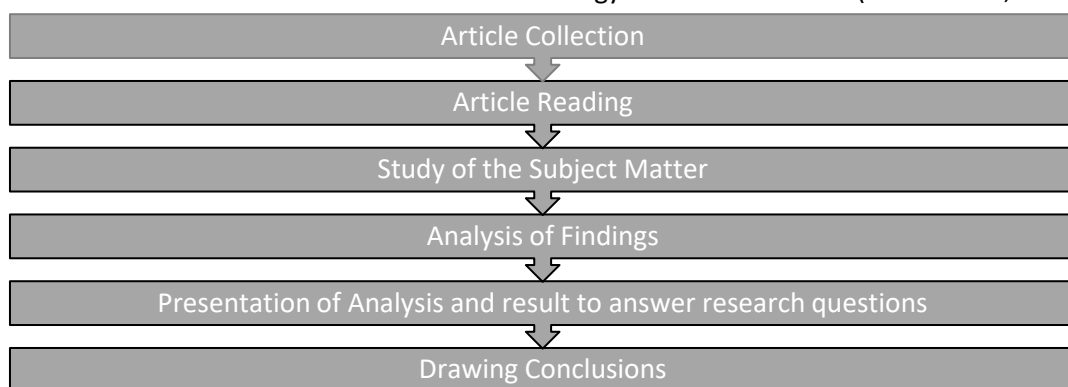
The evolution of educational technology is marked by several key milestones that have significantly transformed the landscape of teaching and learning. One of the earliest milestones was the introduction of audiovisual aids such as films, slides, and overhead projectors in the mid-20th century. These tools were revolutionary at the time, providing new ways to present information and engage students visually. The subsequent advent of personal computers in the late 20th century represented a major leap forward (Jaakkola, 2024). Computers facilitated the development of educational software and interactive learning programs, enabling more personalized and self-paced learning experiences. The proliferation of the internet in the 1990s further revolutionized educational technology by providing unprecedented access to information and resources, paving the way for the emergence of online learning platforms and distance education programs (Akhmetshin, 2019; Molenda, 2022).

In the 21st century, the evolution of educational technology continued with the introduction of Learning Management Systems (LMS), which facilitated the organization, delivery, and tracking of educational content. Technologies such as interactive whiteboards, tablets, and mobile devices have become commonplace in classrooms, further enhancing interactive and engaging learning experiences. More recently, advancements in virtual reality (VR), augmented reality (AR), and artificial intelligence (AI) have opened up new possibilities for immersive and adaptive learning environments. These technologies enable students to experience simulations and scenarios that were previously impossible, thus enhancing understanding and retention. Online learning platforms, such as MOOCs (Massive Open Online Courses), have democratized education by providing access to high-quality courses from top institutions to learners worldwide, making education more accessible and flexible than ever before (Calinger & Howard, 2008; Kloos et al., 2019).

**METHODS**

The method employed in this scientific article research is a literature review. A literature review is a well-defined, transparent, and replicable process of identifying, assessing, and integrating research articles and ideas generated by scholars and practitioners. The use of a literature review is to review the existing literature on the topic of interest and to determine the research gaps that need to be filled. This method entails a sequence of activities, which include the library data collection, reading, writing, and management of writing materials. The research stages are as follows: First, search for articles on the historical definitions and developments of educational technology from databases like Google Scholar and Scopus.

The collected literature is then read, analysed, and synthesized to get detailed information concerning the research questions. This approach guarantees the understanding of the historical development of educational technology and emphasizes the major events in the process, with the focus on the definitions of educational technology from 1970 to 2024 (Booth et al., 2016).



*Figure 1. Research stages*

*Table 1. The Themes Determined for the Educational Technology Definitions and Milestone Development during the Evolution*

<b>Year</b>	<b>Contributor(s)</b>	<b>Definitions</b>	<b>Scope</b>	<b>Milestone Development</b>
1970	Commission on Instructional Technology	Instructional technology refers to media produced as a result of the communication revolution that can be utilized in classrooms alongside teachers, textbooks, and blackboards. It is also a systematic way of designing, carrying out, and evaluating the total process of learning and teaching.	Media and instructional aids	Introduction of audiovisual aids such as films, slides, and overhead projectors. The focus was on integrating these media into traditional teaching environments.
1983	Ely, D.P.	Educational technology is defined as the development, application, and evaluation of systems, techniques, and aids to improve the process of human learning.	Systems, techniques, and aids for learning	Expansion of systematic planning, design, and evaluation of instructional processes. Increased use of computers for educational purposes.
1994	Seels, B., & Richey, R. C.	Instructional technology is the theory and practice of design, development, utilization, management, and evaluation of processes and resources for learning.	Theory and practice of instructional design	Rise of digital tools and online resources. Introduction of Learning Management Systems (LMS) and the use of the internet for educational purposes.
2004	AECT	Educational technology is defined as the development, application, and evaluation of systems, techniques, and aids to improve the process of human learning.	Ethical practice, technological processes and resources	Widespread use of interactive whiteboards, educational software, and the growth of e-learning platforms. Emphasis on ethical considerations and broad impacts on educational practices.
2017	Reiser, R. A., & Dempsey, J. V.	Educational technology is the study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources.	Digital tools, interactive learning, systemic instructional design	Incorporation of mobile learning, virtual and augmented reality, and artificial intelligence in education. Development of personalized and adaptive learning environments.
2019	Huang, R., Spector, J., & Yang, J.	Educational technology refers to the use of tools, technologies, processes, procedures, resources, and strategies to improve learning experiences in a variety of settings, such as formal learning, informal learning, non-formal learning, lifelong learning, learning on	Human-centered approaches, immersive and adaptive learning, diverse learning settings	Enhanced use of VR, AR, and AI to facilitate personalized and interactive learning experiences. Increased focus on immersive learning environments and AI-driven personalized learning.

Year	Contributor(s)	Definitions	Scope	Milestone Development
		demand, workplace learning, and just-in-time learning.		
2024	Huang, R., Spector, J. M., & Yang, J.	Educational technology (EdTech) encompasses tools, technologies, and resources aimed at improving learning experiences. This includes hardware (computers, tablets, webcams) and software (simulations, LMS, AR, VR).	Enables teachers to digitalize planning and enrich lessons, while allowing students to access content anytime and collaborate with peers.	Digitalizing curriculum planning, enriching lessons, encouraging engagement, facilitating teacher-student interaction, analyzing performance data and emergence of AR and VR for immersive learning, AI for personalized education, and analytics for data-driven insights.

## RESULTS AND DISCUSSION

### Results

The definitions of educational technology have changed over the years from 1970 to 2024 due to changes in technology and learning. First, in 1970, educational technology was characterized by the use of media and audiovisual means, and the systematic approach to the learning process design and evaluation. By 1983, the definition had broadened to encompass the design, implementation, and assessment of systems, methods, and tools for enhancing human learning. The definition was expanded again in 1994 to include the theory and practice of instructional design, which saw the emergence of technology and the use of online resources.

In 2004, the focus was on the ethical practice of supporting learning through technological procedures, due to the increased use of interactive whiteboards and e-learning. By 2017, the definition incorporated digital media, learning environments, and systemic instructional designs, which emphasized the use of mobile learning, virtual and augmented reality, and artificial intelligence. The definition provided by Huang, Spector, and Yang in 2019 defined educational technology as the use of technology in learning environments, including tools and techniques, with a focus on virtual reality and AI-based adaptive learning. The 2024 definition built upon the previous ones and added the aspects of digitalization, artificial intelligence, data analysis, and learning environments that are collaborative, interactive, and lifelong. There are several stages in the development of educational technology that can be considered as major steps in the use of technology in education. In the 1970s, the use of films and overhead projectors as teaching aids was a significant advancement in the use of new media technologies in classrooms. The systematic instructional processes were further developed in the 1980s with the incorporation of computers as the learning systems became more structured and evaluated.

The 1990s saw the rise of digital tools and the introduction of Learning Management Systems (LMS), which revolutionized the delivery and management of educational content online. The early 2000s were characterized by the widespread adoption of interactive whiteboards, educational software, and e-learning platforms, emphasizing ethical considerations in using technology for education. In 2019, the enhanced use of VR, AR, and AI facilitated more personalized and interactive learning, with a focus on creating diverse learning settings. The most recent developments in 2024 reflect a comprehensive integration of digital innovations, with AI and data analytics playing crucial roles in personalizing education and providing actionable insights for improving learning outcomes.

### *Discussion*

The evolution of educational technology from the 1970s to 2024 demonstrates a dynamic and expansive growth in both definitions and applications. In the 1970s, educational technology was primarily defined by its use of media and audiovisual aids to enhance traditional classroom teaching (Commission on Instructional Technology, 1970). The scope at this time was relatively narrow, focusing on integrating basic media technologies into educational environments. By the 1980s, the definition had evolved to include systems and techniques designed to improve human learning, reflecting the increasing importance of systematic instructional design and the growing use of computers in education (Ely, 1983). This trend continued in the 1990s, where the emphasis shifted towards the theory and practice of instructional design, with the rise of digital tools and online resources such as Learning Management Systems (LMS) (Seels & Richey, 1994).

The early 2000s brought a broader understanding that included ethical practices and the management of technological processes, highlighting the widespread adoption of interactive whiteboards and e-learning platforms (AECT, 2004). By the late 2010s, definitions of educational technology had expanded to incorporate mobile learning, virtual and augmented reality, and artificial intelligence, emphasizing personalized and adaptive learning environments (Reiser & Dempsey, 2017). The most recent definitions, such as in 2024, reflect a comprehensive integration of digital innovations, AI, data analytics, and collaborative, interactive, and lifelong learning environments (GowherHassan, 2023).

The evolution of educational technology has been marked by several key milestones. In the 1970s, the introduction of audiovisual aids like films and overhead projectors marked the beginning of integrating new media technologies into classrooms (Li, 2023). This period focused on enhancing traditional teaching methods with new media technologies to improve instructional delivery. In the 1980s, the emphasis shifted towards the development and application of systems, techniques, and aids to improve the process of human learning, reflecting a more systematic approach to instructional design and the growing use of computers in education (Ely, 1983).

The 1990s marked a significant shift with the rise of digital tools and the introduction of Learning Management Systems (LMS), which revolutionized the delivery and management of educational content online (Alshammari, 2015). This period also saw the increased use of the internet for educational purposes, enabling a more interactive and accessible learning environment (Barranca, 2022). The early 2000s witnessed the widespread adoption of interactive whiteboards, educational software, and e-learning platforms, emphasizing the importance of ethical considerations in the use of technology for education (Reiser & Ely, 1997). By the late 2010s, mobile learning, virtual and augmented reality, and artificial intelligence were incorporated into educational settings, leading to the development of personalized and adaptive learning environments. These technologies allowed for more immersive and engaging learning experiences, tailored to the needs of individual learners (Lowyck, 2014)

### **CONCLUSION**

The analysis of the educational technology from 1970 to 2024 shows that the various of definitions of technology and the development evolution of educational technology are intertwined. Originally, the field was concerned with the incorporation of audiovisual materials as an addition to traditional teaching methods, and has gradually evolved to include digital tools, interactive learning environments, and systematic instructional designs. Every decade had its achievements, from the personal computers and the internet in the 1990s to the present day use of virtual reality, artificial intelligence, and learning management systems. These developments have not only broadened the definitions and uses of educational technology but also revealed the persistent issues, including the professional learning and technology equity. In conclusion, the historical perspective shows that educational technology has always been in a

process of development, trying to respond to the needs of educators and learners, and to improve the quality and availability of education for people all over the world.

#### CONFLICT OF INTEREST

There is no conflict of interest regarding the publication of this article.

#### REFERENCES

- Abbas, A., Hosseini, S., Núñez, J., & Sastre-Merino, S. (2021). Emerging technologies in education for innovative pedagogies and competency development. *Australasian Journal of Educational Technology*. <https://doi.org/10.14742/ajet.7680>.
- AECT. (2004). *Educational Technology: A definition with commentary*.
- Akhmetshin, E., Ibatullin, R., Gapsalamov, A., Vasilev, V., & Bakhvalov, S. (2019). Audiovisual aids application in the secondary-level vocational education establishments. *International Journal of Educational Management*. <https://doi.org/10.1108/IJEM-02-2018-0082>.
- Alshammari, M. S. (2015). *Academics' Adoption and Usage of Learning Management Systems in Saudi Arabia's Universities*.
- An, T., & Oliver, M. (2021). What in the world is educational technology? Rethinking the field from the perspective of the philosophy of technology. *Learning, Media and Technology*, 46(1), 6-19.
- Barranca Cavero, AV (2022). *Virtual learning environments in the academic performance of early childhood education students in a private entity, year 2022*.
- Bin, L., Ahmad, N., & Darliana. (2021, December). Analysis on the development of Art and Design in Local Colleges and Universities in the Internet Era: Taking Shaanxi Province as an example. In *Proceedings of the 2021 9th International Conference on Information Technology: IoT and Smart City*, 272-277.
- Booth, A., James, M. S., Clowes, M., & Sutton, A. (2021). Systematic approaches to a successful literature review. Webb, R., Watson, D., Shepherd, C., & Cook, S. (2021). Flipping the classroom: is it the type of flipping that adds value? *Studies in Higher Education*, 46(8), 1649-1663.
- Calinger, M., & Howard, B. C. (2008). Evaluating educational technologies: A historical context. *International Journal of Information and Communication Technology Education (IJICTE)*, 4(4), 9-18.
- Commission on Instructional Technology, Washington, DC. (1969). *To improve learning: A report to the President and the Congress of the United States*. ERIC Clearinghouse.
- Cuban, L. (1986). *Teachers and machines: The classroom use of technology since 1920*. Teacher's college press.
- Garrison, D. R., & Vaughan, N. D. (2008). *Blended learning in higher education: Framework, principles, and guidelines*. John Wiley & Sons.
- GowherHassan, M., & Hassan, G. (2023). TECHNOLOGY AND THE TRANSFORMATION OF EDUCATIONAL PRACTICES: A FUTURE PERSPECTIVE. *International Journal of Economic, Business, Accounting, Agriculture Management and Sharia Administration (IJEBAS)*. <https://doi.org/10.54443/ijevas.v3i1.1136>.
- Hartley, R., Kinshuk, Koper, R., Okamoto, T., & Spector, J. M. (2010). The education and training of learning technologists: A competences approach. *Journal of Educational Technology & Society*, 13(2), 206-216.
- Huang, R., Spector, J. M., Yang, J., Huang, R., Spector, J. M., & Yang, J. (2019). Introduction to educational technology. *Educational technology: A primer for the 21st century*, 3-31.
- Jaakkola, H., Henno, J., & Mäkelä, J. (2023). Computers in Education. *2023 46th MIPRO ICT and Electronics Convention (MIPRO)*, 833-839. <https://doi.org/10.23919/MIPRO57284.2023.10159980>

- Kloos, C. D., Alario-Hoyos, C., Muñoz-Merino, P. J., Ibáñez, M. B., Estévez-Ayres, I., & Crespo-García, R. M. (2019, April). What can you do with educational technology that is getting more human? In *2019 IEEE global engineering education conference (EDUCON)*, 1480-1487.
- Koehler, M., & Mishra, P. (2009). What is technological pedagogical content knowledge (TPACK)? *Contemporary issues in technology and teacher education*, 9(1), 60-70.
- Li, S. (2023). The historical evolution of educational technology: from the printing press to online education. *Journal of Pedagogical Research*, 1(1), 1-10. <https://doi.org/10.31166/voprosyistorii202309statyi27>.
- Lowyck, J. (2014). *Bridging Learning Theories and Technology-Enhanced Environments: A Critical Appraisal of Its History*, 3-20. [https://doi.org/10.1007/978-1-4614-3185-5\\_1](https://doi.org/10.1007/978-1-4614-3185-5_1).
- Molenda, M. H. (2022). History and development of instructional design and technology. In *Handbook of open, distance and digital education*, 1-18. Singapore: Springer Singapore.
- Seels, B., & Richey, R. C. (1994). Instructional Technology: The Definition and Domains of the Field. *Association for Educational Communications and Technology*. <https://www.amazon.com/Instructional-Technology-Definition-Division-Education/dp/089240106X>.
- Selwyn, N. (2016). *Education and technology: Key issues and debates*. Bloomsbury Publishing.

## **Implementasi Model *Problem-Based Learning* dengan Pendekatan Berdiferensiasi Berbasis Kemampuan Awal Siswa dan Teori *Zone of Proximal Development* (ZPD) untuk Meningkatkan Keaktifan Belajar di Kelas X TJKT SMK Negeri 1 Sukoharjo**

**Puruhita Mega Pawitra<sup>1</sup>, Cucuk Wawan Budiyo<sup>2</sup>, Joko Slamet Raharjo<sup>2</sup>**

<sup>1</sup>Teacher Professional Education, Universitas Sebelas Maret, Surakarta, Indonesia

<sup>2</sup>Informatics Engineering Education, Universitas Sebelas Maret, Surakarta, Indonesia

<sup>3</sup>SMK Negeri 1 Sukoharjo, Sukoharjo, Indonesia

E-mail: <sup>1</sup>[pawitr4\\_mega@student.uns.ac.id](mailto:pawitr4_mega@student.uns.ac.id)\*, <sup>2</sup>[cbudiyanto@staff.uns.ac.id](mailto:cbudiyanto@staff.uns.ac.id), <sup>2</sup>[jaunamaritza@gmail.com](mailto:jaunamaritza@gmail.com)

\*Corresponding Author

*Article History: Received: September 29, 2024; Accepted: April 25, 2025; Published: June 30, 2025*

### **ABSTRACT**

This study aims to examine the effectiveness of implementing Problem-Based Learning (PBL) combined with differentiated instruction and the Zone of Proximal Development (ZPD) in enhancing student engagement in Grade 10 Technical Vocational High School students at SMK N 1 Sukoharjo. This quantitative research employed observation and questionnaire as research instruments. The results showed a significant increase in student engagement after the implementation of the learning model. The increase occurred in various aspects, such as active participation in discussions, independent task completion, and positive attitudes during the learning process. The combination of PBL, differentiated instruction, and ZPD proved effective in creating a more interactive and motivating learning environment for students. This study suggests the need for further research to expand the implementation of this learning model in various educational contexts.

**Keywords:** *Problem-Based Learning, PBL, Differentiated Instruction, Zone of Proximal Development, ZPD*



**Copyright © 2025 The Author(s)**

**This is an open access article under the [CC BY-SA](https://creativecommons.org/licenses/by-sa/4.0/) license.**

### **PENDAHULUAN**

Pendidikan dalam Kurikulum Merdeka menekankan pembelajaran yang berfokus pada siswa, di mana siswa dibebaskan untuk mengembangkan potensi diri secara maksimal. Guru berperan sebagai fasilitator, melakukan pendampingan terhadap siswa dalam mencapai tujuan pembelajaran yang telah dirancang. Dalam pendekatan ini, guru juga bertanggung jawab mewujudkan suasana belajar yang kondusif dan mendukung, termasuk pengelolaan kelas, pemanfaatan sumber daya, media, dan fasilitas yang diperlukan untuk mendorong keterlibatan aktif siswa. Keterlibatan aktif siswa sangat penting, karena siswa yang terlibat lebih aktif dalam proses pembelajaran biasanya menunjukkan minat yang lebih besar dan pemahaman yang lebih mendalam terhadap materi yang diajarkan oleh guru. Dengan mengadopsi berbagai strategi inovatif dalam pembelajaran, guru dapat mendorong suasana kelas yang interaktif dan dinamis, sehingga siswa tidak hanya sekadar mendengarkan dan mencatat, tetapi juga berpartisipasi dalam diskusi, bekerja sama, dan memecahkan masalah. Sayangnya, realitas di kelas sering kali

menunjukkan bahwa pembelajaran masih belum sepenuhnya efektif, dengan banyak siswa yang masih pasif dan kurang berpartisipasi dalam kegiatan belajar (Ghiffar, M. A. N., Nurisma, E., Kurniasih, C., & Bhakti, C. P., 2018).

Untuk meningkatkan keaktifan siswa dalam kegiatan belajar di kelas, salah satu strategi yang efektif yaitu dengan mengimplementasikan model *Problem-Based Learning* (PBL). *Problem-Based Learning* (PBL) merupakan pendekatan pembelajaran yang memotivasi siswa untuk memahami proses belajar sambil bekerja sama dalam kelompok guna menemukan solusi terhadap permasalahan yang ada dalam kehidupan nyata (Arends & Kilcher, 2010 dalam modul Pedagogi PPG). Dalam model *Problem-Based Learning* (PBL), siswa terlibat dalam penyelesaian masalah yang relevan dengan kehidupan sehari-hari (Mayasari, 2022). Menurut Perdana, PBL merupakan metode pembelajaran yang difokuskan pada penyelesaian masalah (Perdana, 2015). Masalah yang dihadirkan dalam PBL memiliki konteks yang relevan dengan dunia nyata. Proses pemecahan masalah ini memotivasi siswa untuk berpikir kritis, berkomunikasi, dan bekerja sama dalam tim. Melalui PBL, siswa tidak hanya mendapatkan pengetahuan, namun juga mengasah keterampilan abad ke-21, termasuk kemampuan berpikir kritis yang sangat diperlukan di masa depan (Fajarwati, 2020). Selain itu, PBL mendorong siswa untuk lebih mandiri dalam belajar, sehingga tidak hanya bergantung pada guru sebagai sumber pengetahuan, tetapi juga berkolaborasi dengan teman sejawat dalam proses belajar (Wijnen, 2017).

Namun, penerapan PBL di kelas tidak selalu mudah karena perbedaan kemampuan awal siswa. Oleh karena itu, pendekatan berdiferensiasi berbasis kemampuan awal siswa sangat penting untuk memastikan setiap siswa dapat terlibat secara maksimal. Diferensiasi memungkinkan pendidik untuk melakukan penyesuaian proses, konten, dan produk pembelajaran sesuai dengan kebutuhan individual siswa (Loyens, 2015). Pembelajaran berdiferensiasi merupakan proses pembelajaran yang fokus pada kebutuhan belajar siswa, disesuaikan dengan karakteristik masing-masing individu. Pendekatan berdiferensiasi bertujuan untuk memberikan pendekatan yang lebih personal, sehingga setiap siswa dapat belajar menggunakan metode yang paling sesuai. Pendekatan ini membantu meningkatkan keterlibatan dan hasil belajar siswa secara keseluruhan (Sukanti, 2019). Dengan strategi ini, siswa yang memiliki kemampuan lebih rendah dapat memperoleh dukungan yang diperlukan, sementara siswa yang lebih mampu dapat diberikan tantangan yang lebih kompleks. Dengan cara ini, siswa secara keseluruhan mampu berpartisipasi secara aktif dalam proses pembelajaran, terlepas dari perbedaan kemampuan siswa.

Untuk meningkatkan keaktifan siswa, *Problem-Based Learning* (PBL) dapat diintegrasikan dengan pendekatan berdiferensiasi berbasis kemampuan awal siswa, yang memungkinkan setiap siswa berperan aktif dalam menyelesaikan masalah nyata. Menurut Mulbar, et al. (2018) dalam penelitiannya, keaktifan siswa meningkat setelah penerapan pembelajaran berbasis masalah yang menggunakan strategi diferensiasi. Siswa menjadi lebih terlibat dalam proses belajar, seperti aktif bertanya, menjawab pertanyaan, berdiskusi, serta mencari informasi yang relevan dengan topik pembelajaran yang sedang dipelajari. Penerapan Teori *Zone of Proximal Development* (ZPD) dari Vygotsky, yang menekankan pentingnya scaffolding dari guru dan teman sebaya, mendukung proses ini dengan memberikan tantangan yang sesuai dengan tingkat perkembangan siswa (K. Shabani, 2010). Hal ini menunjukkan bahwa kombinasi PBL dan pendekatan diferensiasi berbasis ZPD meningkatkan motivasi dan kepercayaan diri siswa, serta mempersiapkan siswa untuk menghadapi tantangan dunia nyata dengan lebih baik (Dixon, 2014). Pendekatan ini memberikan fleksibilitas dalam penugasan dan aktivitas, sehingga memungkinkan semua siswa berkontribusi aktif dalam pembelajaran (Tomlinson, 2014). Dengan cara ini, siswa dapat mengembangkan keterampilan dan pengetahuan baru yang relevan dengan kebutuhan siswa.

Di SMK N 1 Sukoharjo, penerapan model PBL yang dikombinasikan dengan pendekatan berdiferensiasi berbasis ZPD diharapkan dapat meningkatkan keaktifan belajar di kelas X TJKT. Keaktifan belajar sangat penting dalam pendidikan vokasi, terutama dalam mempelajari keterampilan praktis yang dibutuhkan di dunia kerja. Penelitian ini bertujuan untuk menguji tingkat keefektifan penerapan model PBL dan pendekatan diferensiasi yang diharapkan dapat meningkatkan partisipasi aktif siswa dalam pembelajaran. Peneliti berharap hasil penelitian ini dapat memberikan wawasan baru tentang strategi pembelajaran yang efektif dalam pendidikan vokasi, sehingga dapat menjadi acuan bagi pendidik untuk merancang pembelajaran yang lebih inovatif dan responsif terhadap kebutuhan siswa.

## METODE

Penelitian yang dilakukan peneliti menggunakan pendekatan kuantitatif untuk mengevaluasi efektivitas implementasi model *Problem-Based Learning* (PBL) yang dipadukan dengan pendekatan berdiferensiasi berdasarkan kemampuan awal siswa dan teori *Zone of Proximal Development* (ZPD) dalam meningkatkan keaktifan belajar siswa kelas X TJKT di SMK Negeri 1 Sukoharjo. Pada umumnya, terdapat tiga pendekatan penelitian yang umum diterapkan dalam penelitian ilmiah, yakni pendekatan kuantitatif, kualitatif, dan kombinasi (Strijker, 2020). Pendekatan kuantitatif dipilih karena mampu memberikan data yang objektif dan terukur terkait perubahan keaktifan siswa sebelum dan setelah penerapan model tersebut (Creswell, 2014).

Penelitian ini dilaksanakan di SMK N 1 Sukoharjo dengan subjek penelitian adalah 36 siswa kelas X TJKT 1 di SMK N 1 Sukoharjo, di mana kelas ini memiliki keberagaman kemampuan awal yang dianggap relevan untuk penerapan model PBL berdiferensiasi berbasis ZPD.

Instrumen yang digunakan dalam penelitian ini meliputi dua metode utama, sebagai berikut.

### 1. Observasi

Peneliti menggunakan lembar observasi berbasis rubrik yang dirancang untuk mengevaluasi keaktifan siswa dalam hal partisipasi, interaksi, dan keterlibatan selama proses pembelajaran. Observasi dilakukan dalam dua fase:

- a. Pra-intervensi, yaitu observasi keaktifan siswa dalam pembelajaran konvensional.
- b. Pasca-intervensi, yaitu observasi setelah penerapan model PBL berdiferensiasi. Kriteria yang diamati meliputi partisipasi siswa dalam diskusi, keterlibatan dalam tugas kelompok, dan frekuensi interaksi dengan guru.

### 2. Kuesioner

Kuesioner digunakan untuk mengukur persepsi siswa mengenai motivasi belajar dan pandangan siswa terhadap efektivitas model PBL yang diterapkan. Kuesioner ini terdiri dari 10 item yang dievaluasi menggunakan skala Likert 1 – 5, mulai dari "sangat tidak setuju" hingga "sangat setuju". Kuesioner ini dibagikan sebelum dan sesudah intervensi untuk melihat perubahan pada persepsi siswa terhadap model pembelajaran.

Proses pengumpulan data dilakukan melalui dua tahap, yaitu tahap pra-intervensi berupa observasi yang dilakukan dalam satu pertemuan, di mana belum diterapkan model pembelajaran *Problem-Based Learning* (PBL) dan belum diterapkan pendekatan berdiferensiasi berbasis *Zone of Proximal Development* (ZPD). Tahap pra-intervensi dilakukan untuk mengukur tingkat keaktifan siswa dalam pembelajaran konvensional. Tahap ke dua adalah tahap pasca-intervensi, dimana mulai diimplementasikan model PBL berdiferensiasi berbasis ZPD yang dilakukan dalam dua pertemuan. Di samping itu kuuesioner diisi oleh siswa untuk mengukur perubahan persepsi siswa terhadap pembelajaran. Data dari kedua fase ini dibandingkan untuk mengidentifikasi perubahan signifikan dalam keaktifan belajar siswa.

Penelitian ini dilaksanakan dengan tetap memperhatikan aspek etika penelitian. Responden diberi informasi mengenai tujuan penelitian dan dijamin kerahasiaan serta anonimitas data siswa. Selain itu, observasi dilakukan dengan izin dari pihak sekolah dan subjek yang diamati.

## HASIL DAN PEMBAHASAN

### *Hasil Penelitian dan Pembahasan Observasi Kuantitatif*

Pada tahap observasi keaktifan belajar siswa, dilakukan berdasarkan empat indikator utama, yaitu partisipasi dalam kelas, partisipasi dalam berdiskusi, pelaksanaan tugas individu, dan perilaku selama pembelajaran. Setiap indikator dievaluasi menggunakan skala Likert 1 – 5, yang dapat dilihat dalam tabel berikut.

*Tabel 1. Indikator Keaktifan Siswa*

Indikator	Deskripsi	5 (Sangat Baik)	4 (Baik)	3 (Cukup)	2 (Kurang)	1 (Sangat Kurang)
Partisipasi dalam Kelas	Mengajukan pertanyaan, memberikan pendapat, menanggapi ide teman.	Selalu berpartisipasi, mengajukan pertanyaan mendalam, dan memberikan ide-ide kreatif.	Sering berpartisipasi, memberikan tanggapan yang relevan.	Kadang-kadang berpartisipasi, tetapi kurang aktif dalam memberikan masukan.	Kurang aktif, jarang mengajukan pertanyaan atau memberikan pendapat.	Tidak berpartisipasi sama sekali.
Partisipasi dalam Berdiskusi	Berkolaborasi dalam kegiatan kelas atau tugas kelompok.	Selalu menjadi inisiator, menyelesaikan tugas tepat waktu, dan berkontribusi signifikan.	Aktif berpartisipasi, menyelesaikan tugas dengan baik.	Kadang-kadang berpartisipasi, kurang aktif dalam menyelesaikan tugas.	Kurang terlibat dalam tugas kelompok dan sering mengandalkan teman.	Tidak berkontribusi dalam diskusi atau tugas kelompok.
Pelaksanaan Tugas Individu	Mengerjakan tugas tepat waktu dan menunjukkan kualitas kerja yang baik.	Selalu tepat waktu, kualitas kerja sangat baik, dan menunjukkan inisiatif tinggi.	Sering tepat waktu, kualitas kerja baik.	Kadang-kadang terlambat, kualitas kerja cukup.	Sering terlambat, kualitas kerja kurang baik.	Tidak mengerjakan tugas atau sangat terlambat.
Perilaku selama Pembelajaran	Menunjukkan fokus, minat, dan sikap positif selama pembelajaran.	Selalu fokus, antusias, dan bersikap positif.	Sering fokus, antusias, dan bersikap positif.	Kadang-kadang fokus, sering terganggu.	Sering tidak fokus, tidak antusias, dan bersikap negatif.	Tidak menunjukkan minat atau fokus sama sekali.

#### a. Pra-intervensi

Pada tahap pra-intervensi, dilakukan observasi keaktifan siswa selama pertemuan pertama yang menggunakan model pembelajaran konvensional. Model pembelajaran konvensional menempatkan guru sebagai pusat dan sumber utama informasi. Dalam model ini, guru memberikan penjelasan lisan kepada siswa yang umumnya mendengarkan dan mencatat. Siswa cenderung pasif, hanya menerima informasi tanpa banyak interaksi atau diskusi. Model ini sering digunakan di sekolah-sekolah, tetapi kurang efektif dalam mendorong partisipasi aktif siswa (Saputra, 2019). Dalam metode ini, guru menjelaskan materi, sementara siswa mendengarkan dengan sedikit interaksi.

Pada data awal dihasilkan keaktifan siswa di kelas berada pada rata-rata 2,82, yang termasuk dalam kategori cukup aktif. Setiap indikator menunjukkan hasil berikut: (1) Partisipasi dalam Kelas: 2,33; (2) Partisipasi dalam Berdiskusi: 2,81; (3) Pelaksanaan Tugas Individu: 3,22; dan (4) Perilaku selama Pembelajaran: 2,92.

Berdasarkan hasil observasi tersebut, siswa tampak kurang berpartisipasi dalam kelas, terutama dalam mengajukan pertanyaan atau memberikan pendapat. Tingkat partisipasi dalam diskusi dan kerja kelompok juga kurang optimal. Hasil ini sesuai dengan temuan bahwa pendekatan pembelajaran konvensional seringkali tidak cukup untuk memfasilitasi keterlibatan siswa secara aktif (Hmelo-Silver, 2019)

Berdasarkan hasil pada tahap pra intervensi, diambil langkah untuk tahap selanjutnya dengan menerapkan model *Problem-Based Learning* (PBL) melalui dua siklus dengan pendekatan Berdiferensiasi Berbasis Kemampuan Awal Siswa dan prinsip *Zone of Proximal Development* (ZPD) dari Vygotsky. Harapannya, pendekatan ini akan meningkatkan keaktifan, diskusi, dan keterampilan berpikir kritis siswa.

#### b. Pasca-intervensi

Pada tahap pasca-intervensi, kegiatan observasi dibagi menjadi dua siklus. Dalam kedua siklus tersebut guru menerapkan model pembelajaran *Problem-Based Learning* (PBL) dengan pendekatan berdiferensiasi berbasis kemampuan awal siswa serta menerapkan prinsip *Zone of Proximal Development* (ZPD) dari Vygotsky. Setiap tahapan dalam siklus ini mengikuti urutan sintaks PBL, di antaranya pengorientasian pada masalah, pengorganisasian siswa untuk belajar, pembimbingan penyelidikan individu/kelompok, pengembangan dan penyajiann hasil karya, dan tahap analisis serta evaluasi proses pemecahan masalah (Hosnan, 2014). Dalam pendekatan berdiferensiasi, guru mempertimbangkan kemampuan awal siswa dan membagi siswa dalam kelompok-kelompok sesuai dengan kesiapan masing-masing. Melalui ZPD, guru berperan sebagai fasilitator yang memberikan bimbingan sesuai dengan kebutuhan setiap siswa, terutama dalam membantu siswa mencapai tingkat perkembangan potensial. Setiap tahapan PBL, mulai dari orientasi terhadap masalah hingga analisis dan evaluasi, dirancang untuk memberikan tantangan yang dapat dicapai oleh siswa dengan bantuan teman sebaya atau guru. Dengan demikian, siswa didorong untuk memecahkan masalah melalui kolaborasi, sekaligus mengasah keterampilan berpikir kritis dan kemampuan kolaborasi dalam kelompok.

##### 1) Siklus 1

Pada siklus I penerapan model PBL dengan pendekatan Berdiferensiasi Berbasis Kemampuan Awal Siswa serta menerapkan prinsip *Zone of Proximal Development* (ZPD) pada Siklus 1, keaktifan siswa meningkat dengan rata-rata 3,36. Setiap indikator menunjukkan peningkatan sebagai berikut.

- a) Partisipasi dalam Kelas: 2,86
- b) Partisipasi dalam Berdiskusi: 3,11
- c) Pelaksanaan Tugas Individu: 3,86
- d) Perilaku selama Pembelajaran: 3,61

Model PBL berhasil memfasilitasi partisipasi siswa secara lebih aktif dalam diskusi kelas dan kerja kelompok. Siswa menjadi lebih tertantang dan termotivasi untuk berkontribusi dalam proses pemecahan masalah, sejalan dengan temuan penelitian sebelumnya yang menunjukkan bahwa PBL meningkatkan keterlibatan siswa.

##### 2) Siklus 2

Pada Siklus 2, terjadi peningkatan rata-rata keaktifan siswa menjadi 3,76. Setiap indikator menunjukkan hasil berikut.

- a) Partisipasi dalam Kelas: 3,28

- b) Partisipasi dalam Berdiskusi: 3,39
- c) Pelaksanaan Tugas Individu: 4,19
- d) Perilaku selama Pembelajaran: 4,19

Pendekatan diferensiasi berbasis ZPD memberikan tantangan yang tepat untuk setiap siswa, memungkinkan siswa belajar sesuai dengan tingkat kemampuan dan motivasi masing-masing. Hal ini terbukti dengan peningkatan dalam semua indikator, terutama keaktifan siswa dalam kelas dan diskusi kelompok. Model ini sesuai dengan teori Vygotsky tentang pentingnya bantuan yang sesuai untuk memfasilitasi perkembangan belajar siswa dalam ZPD (Vygotsky, 1978).

Penerapan model PBL dan pendekatan berdiferensiasi berbasis ZPD menunjukkan peningkatan rata-rata sebesar 33% dalam keaktifan belajar siswa, dengan rincian peningkatan 40% dalam hal partisipasi siswa dalam kelas, peningkatan 21% dalam hal partisipasi dalam berdiskusi, peningkatan sebesar 30% dalam hal pelaksanaan tugas individu, dan peningkatan sebesar 44% dalam hal perilaku siswa selama pembelajaran ber. Hasil ini menggarisbawahi pentingnya desain pembelajaran yang adaptif dan responsif terhadap kebutuhan individual siswa (Tomlinson C. A., 2017), serta pentingnya pemberian tantangan yang sesuai dengan tingkat kemampuan siswa dalam rangka mendorong partisipasi aktif (Shabani, 2020).

#### *Kuesioner Kuantitatif*

Sebagai pendukung hasil observasi, kuesioner kuantitatif dengan 15 pertanyaan telah disebarkan kepada 36 siswa, menggunakan skala Likert 1 – 5. Kuesioner ini dirancang untuk mengevaluasi berbagai aspek pembelajaran, termasuk partisipasi siswa, motivasi belajar, efektivitas metode pengajaran yang diterapkan oleh guru, pemahaman materi, dan persepsi terhadap pembelajaran berdiferensiasi. Berikut adalah hasil rata-rata dari kuesioner.

- a. Partisipasi siswa dalam kelas  
Dari tiga pertanyaan mengenai partisipasi siswa dalam kelas, diperoleh skor rata-rata, yaitu 3,8. Siswa menunjukkan tingkat keterlibatan yang aktif dalam mengajukan pertanyaan, memberikan pendapat, dan berpartisipasi dalam diskusi kelas. Ini konsisten dengan hasil observasi yang menunjukkan partisipasi yang tinggi.
- b. Motivasi belajar siswa  
Dari tiga pertanyaan mengenai motivasi belajar siswa, diperoleh skor rata-rata, yaitu 4,0. Skor ini menunjukkan bahwa mayoritas siswa merasa termotivasi oleh penerapan model *Problem-Based Learning* (PBL) dan pendekatan berdiferensiasi yang dilakukan selama pembelajaran.
- c. Keefektifan metode pengajaran  
Dari tiga pertanyaan mengenai keefektifan metode pengajaran yang dilakukan, yaitu PBL diperoleh skor rata-rata sebesar 3,6. Skor ini menunjukkan bahwa siswa menilai bahwa metode PBL cukup efektif dalam membantu siswa memahami materi melalui proyek kolaboratif dan tugas praktis.
- d. Pemahaman materi  
Dari tiga pertanyaan berkaitan pemahaman materi, diperoleh skor rata-rata, yaitu 3,4. Hal ini menunjukkan meskipun pemahaman materi tergolong baik, masih terdapat beberapa siswa yang memerlukan dukungan lebih untuk memahami konsep-konsep yang lebih kompleks.
- e. Presepsi terhadap pembelajaran berdiferensiasi  
Dari tiga pertanyaan berkaitan dengan presepsi terhadap pembelajaran berdiferensiasi, diperoleh skor rata-rata, yaitu 3,8. Skor ini menunjukkan bahwa siswa merasa bahwa pendekatan berdiferensiasi yang diterapkan dalam pembelajaran telah disesuaikan dengan

kebutuhan siswa, baik untuk siswa yang cepat memahami materi maupun bagi yang membutuhkan bimbingan tambahan.

Secara keseluruhan, hasil dari observasi dan kuesioner menunjukkan bahwa penerapan PBL yang dikombinasikan dengan pendekatan berdiferensiasi berbasis *Zone of Proximal Development* (ZPD) memberikan dampak positif terhadap keaktifan dan motivasi siswa. Hal ini sejalan dengan teori Vygotsky (1978), yang menekankan bahwa pembelajaran dalam ZPD memberikan siswa dukungan yang tepat agar siswa dapat mencapai pemahaman yang lebih mendalam. Penerapan ZPD dalam konteks pembelajaran berdiferensiasi mendukung pemahaman bahwa setiap siswa memiliki kebutuhan belajar yang beragam dan unik. Selain itu, Hmelo-Silver (2019) dalam penelitiannya menegaskan bahwa pendekatan PBL dapat meningkatkan keterlibatan siswa dengan mendorong siswa untuk aktif dalam proses belajar melalui penyelesaian masalah. PBL mengajak siswa untuk berkolaborasi dan berinteraksi, yang selanjutnya membantu meningkatkan motivasi dan partisipasi siswa.

## **KESIMPULAN**

Penelitian ini bertujuan untuk menguji efektivitas penerapan model Problem-Based Learning (PBL) yang dikombinasikan dengan pendekatan berdiferensiasi berdasarkan Zone of Proximal Development (ZPD) dalam meningkatkan partisipasi siswa. Hasil penelitian menunjukkan adanya peningkatan yang signifikan dalam keaktifan siswa setelah model pembelajaran tersebut diterapkan. Keaktifan siswa meningkat dalam berbagai aspek, termasuk partisipasi dalam diskusi, pelaksanaan tugas individu, dan perilaku selama pembelajaran. Secara keseluruhan, terdapat peningkatan rata-rata sebesar 33% dalam keaktifan belajar siswa. Peningkatan keaktifan ini dapat dikaitkan dengan beberapa faktor, yaitu: (1) PBL mendorong siswa untuk aktif mencari solusi terhadap masalah nyata, sehingga meningkatkan motivasi dan keterlibatan mereka; (2) pendekatan berdiferensiasi memungkinkan guru menyesuaikan pembelajaran dengan kebutuhan masing-masing siswa, memastikan setiap individu belajar secara optimal; dan (3) Teori ZPD memberikan kerangka kerja untuk memberikan dukungan yang sesuai, membantu siswa mengembangkan potensi mereka secara maksimal dalam proses belajar.

Hasil penelitian ini memiliki implikasi yang signifikan bagi praktik pembelajaran di sekolah. Kombinasi PBL dan pendekatan berdiferensiasi berbasis ZPD terbukti efektif dalam meningkatkan keaktifan dan motivasi belajar siswa. Oleh karena itu, disarankan agar guru lebih sering mengadopsi model pembelajaran ini dalam kegiatan pembelajaran. Selain itu, sekolah perlu menyediakan sumber daya yang memadai untuk mendukung implementasi PBL, seperti pelatihan bagi guru, pengembangan materi pembelajaran yang relevan, dan fasilitas yang mendukung pembelajaran kolaboratif. Penelitian lebih lanjut dapat dilakukan untuk mengeksplorasi efektivitas model pembelajaran ini dalam jangka panjang dan pada mata pelajaran yang berbeda. Selain itu, penelitian juga dapat fokus pada pengembangan instrumen yang lebih spesifik untuk mengukur berbagai aspek keaktifan siswa, seperti keterampilan berpikir kritis dan kreativitas.

## **KONFLIK KEPENTINGAN**

Dalam artikel ini, peneliti menegaskan bahwa tidak terdapat konflik kepentingan terkait penelitian yang berjudul "Implementasi Model *Problem-Based Learning* dengan Pendekatan Berdiferensiasi Berbasis Kemampuan Awal Siswa dan Teori *Zone of Proximal Development* (ZPD) untuk Meningkatkan Keaktifan Belajar di Kelas X TJKT SMK Negeri 1 Sukoharjo." Semua aspek

penelitian, mulai dari pengumpulan data hingga analisis dan pelaporan hasil, dilakukan dengan cara yang independen dan objektif, tanpa adanya pengaruh dari pihak luar.

## REFERENSI

- Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches (4th ed.)*. SAGE Publication.
- Dixon, L. &. (2014). Home Language and Literacy Practices Among Immigrant Second-ILanguage Learners. *Journal Cambridge University Press*, 47, No. 4 ,414-449.
- Fajarwati, I. (2020). *Problem-Based Learning (PBL) to Improve Critical Thinking Skills*. In *Social, Humanities, and Educational Studies (SHES): Conference Series* (pp. 3(3), 2238–2243). <https://jurnal.uns.ac.id/shes>.
- Ghiffar, M. A. N., Nurisma, E., Kurniasih, C., & Bhakti, C. P. (2018). Model Pembelajaran Berbasis Blended Learning dalam Meningkatkan Critical Thinking Skill untuk Menghadapi Era Revolusi Industri 4.0. In *Prosiding Seminar Nasional STKIP Andi Matappa Pangkep*, (pp. Vol. 1, No. 1, pp. 85-94).
- Hmelo-Silver, C. E. (2019). *Problem design in PBL*. Wiley.
- Hosnan, M. (2014). *Pendekatan Sainifik dan Kontekstual dalam Pembelajaran Abad 21: Kunci Sukses Implementasi Kurikulum 2013*. Bogor: Ghalia Indonesia.
- K. Shabani, M. K. (2010). Vygotsky`s Zone of Proximal Development: Instructional Implications and Teachers` Professional Development. *English Lang. Teach*, vol. 3, no. 4, pp. 237–248.
- Loyens, S. J. (2015). *Problem-Based Learning as A Facilitator of Conceptual Change*. *Learning and Instruction*, 38, 34–42.
- Mayasari, A. O. (2022). Implementasi Model *Problem-Based Learning* (PBL) dalam Meningkatkan Keaktifan Pembelajaran. *Jurnal Tahsinia*, 3(2):167–75.
- Mulbar, U. B. (2018). Penerapan Model Pembelajaran Berbasis Masalah dengan Strategi Pembelajaran Diferensiasi pada Peserta Didik Kelas VIII. *Issue in Mathematics Education (IMED)*, 1(1), 1–6.
- Perdana, S. A. (2015). Penggunaan Metode *Problem-Based Learning* Berbantuan Media Audio Visual untuk Meningkatkan Hasil Belajar Matematika Siswa Sekolah Dasar. *Jurnal Pendidikan Dasar*, 4(2), 73–78.
- Saputra, A. N. (2019). Perbandingan Kemampuan Koneksi Matematis Melalui Model Pembelajaran Conecting Organizing Reflecting Extending (Core) dengan Model Pembelajaran Konvensional. *Jurnal Pendidikan Matematika*.
- Shabani, K. K. (2020). The Effect of a Teacher`s Mindset on the Cascading Zones of Proximal Development: A Systematic Review. *Technology, Knowledge and Learning*, 25(3), 587-612.
- Strijker, D. B. (2020). Research methods in rural studies: Qualitative, Quantitative, and Mixed Methods. *Journal of Rural Studies*.
- Sukanti. (2019). Innovation of project base learning (PjBL) on outdoor study for PGSD`s. *International Journal of Innovation, Creativity*, 5(5), 546–561.
- Tomlinson, C. A. (2014). Assessment in a Differentiated Classroom. *Proven Programs in Education: Classroom Management and Assessment*, 1-5.
- Tomlinson, C. A. (2017). *How to Differentiate Instruction in Academically Diverse Classrooms (3rd ed.)*. Alexandria: VA: Association for Supervision and Curriculum Development.
- Wijnen, M. S. (2017). Students and Teachers Experiences with The Implmentation of *Problem-Based Learning* at a University Law School. *The Interdisciplinary Journal of Problem-Based Learning*, Volume 11 Issue 2.

## Supervisi Akademik dalam Meningkatkan Kualitas Pembelajaran di Pendidikan Vokasi: Studi Kualitatif di SMK Negeri

Jonanda Fattah Anugerah<sup>1</sup>, Eka Budhi Santosa<sup>2</sup>

<sup>1,2</sup> Master of Educational Technology, Universitas Sebelas Maret, Surakarta, Indonesia

E-mail: <sup>1</sup>[jonandafattah@student.uns.ac.id](mailto:jonandafattah@student.uns.ac.id)\*, <sup>2</sup>[ekabudhisantosa@staff.uns.ac.id](mailto:ekabudhisantosa@staff.uns.ac.id)

\*Corresponding Author

*Article History: Received: June 18, 2025; Accepted: June 29, 2025; Published: June 30, 2025*

### ABSTRACT

Supervision responsibility is one of the responsibilities that must be carried out by the principal as a teacher with additional duties at school. Therefore, this study aims to determine the implementation of these supervisory responsibilities to the principal of SMK Negeri 1 Pedan Klaten. This research was conducted in June 2024. The design used in this research is qualitative with interview techniques. Data were obtained from interviews with the head of SMK Negeri 1 Pedan Klaten and analyzed by qualitative descriptive method. Based on the analysis, it is known that the principal supervision program has been implemented in the school with procedures that are in accordance with the established supervision standards and the suggested supervision objectives are to improve the quality of learning in the school.

**Keywords:** *Supervision, Principal, SMK*



Copyright © 2025 The Author(s)

This is an open access article under the [CC BY-SA](https://creativecommons.org/licenses/by-sa/4.0/) license.

### PENDAHULUAN

Undang-Undang Nomor 20 Tahun 2003 tentang Sistem Pendidikan Nasional (Sisdiknas) menjelaskan pendidik adalah tenaga kependidikan yang berkualifikasi sebagai guru, dosen, konselor, pamong belajar, widyaiswara, tutor, instruktur, fasilitator, dan sebutan lain yang sesuai dengan kekhususannya, serta berpartisipasi dalam penyelenggaraan pendidikan. Jadi dapat disimpulkan bahwa kepala sekolah merupakan tenaga kependidikan atau guru yang melaksanakan tugas tambahan menurut UU tersebut. Sedangkan menurut Peraturan Menteri Pendidikan Nasional (Permendiknas) Nomor 13 Tahun 2007, kepala sekolah pada setiap jenjang pendidikan adalah guru pada jenjang tersebut dan berhasil terpilih menjadi kepala sekolah. Sebagai seorang kepala sekolah, mereka dituntut untuk memiliki berbagai macam kompetensi tidak kerkecuali kompetensi supervisi (Rismawan, 2017).

Kompetensi supervisi adalah kemampuan kepala sekolah dalam mengimplementasikan tugas dan fungsinya melalui kemampuan/kompetensi yang dimiliki untuk merencanakan program supervisi akademik, melaksanakan supervisi akademik terhadap guru dengan menggunakan pendekatan dan teknik supervisi yang tepat, dan menindaklanjuti hasil supervisi akademik sebagai upaya meningkatkan kualitas pembelajaran di sekolah (Ramadhan, 2017). Sebagai seorang supervisor, kepala sekolah memiliki tanggung jawab dalam peningkatan kemampuan kemampuan guru untuk mengelola kegiatan pembelajaran di sekolah serta mempunyai peranan penting terhadap perkembangan dan kemajuan sekolah. Oleh karena itu,

kepala sekolah harus melakukan supervisi dengan baik berdasarkan prinsip dan teknik yang benar (Raberi et al., 2020).

Supervisi memiliki tujuan utama untuk memperbaiki kualitas pembelajaran di sekolah (Sanglah, 2021). Kualitas pembelajaran yang dimaksud adalah bagaimana efektivitas pelaksanaan proses belajar dan mengajar sehingga dapat mencapai tujuan pembelajaran dan memenuhi visi dan misi sekolah. Kualitas pembelajaran yang baik dapat memberikan dampak yang baik kepada sekolah tersebut. Salah satu contohnya adalah peningkatan akreditasi sekolah yang dinilai oleh pemerintah setiap 5 tahun sekali. Selain memiliki tujuan utama, supervisi juga memiliki tujuan yang lain yaitu meningkatkan kinerja guru di sekolah (Aprida et al., 2022). Berdasarkan Peraturan Menteri Pendidikan Nasional Republik Indonesia Nomor 16 Tahun 2007 tentang Standar Kualifikasi Akademik dan Kompetensi Guru. Dijelaskan bahwa Standar Kualifikasi Akademik dan Kompetensi Guru dikembangkan secara utuh dari 4 kompetensi utama yaitu kompetensi pedagogik, kompetensi kepribadian, kompetensi sosial, dan kompetensi profesional. Keempat kompetensi tersebut terintegrasi dalam kinerja guru.

Terdapat beberapa syarat kondisi dalam melakukan supervisi yang harus dilakukan oleh kepala sekolah, yaitu menciptakan hubungan baik antara guru dan supervisor (dalam hal ini kepala sekolah); merencanakan aspek perilaku yang akan diperbaiki pada sub bahasan tertentu, merencanakan strategi observasi; melakukan observasi guru dalam KBM; menganalisis KBM oleh guru dan supervisor (kepala sekolah) secara terpisah; merencanakan pertemuan, guru diberi kesempatan menanggapi cara mengajarnya sebelum dibahas secara bersama; serta membuat rencana baru jika aspek perilaku itu belum dapat diperbaiki dan mengulangi dari langkah awal sampai akhir. Di samping itu, juga terdapat beberapa prinsip dalam melakukan supervisi yang harus ditaati oleh kepala sekolah, yaitu hubungan antara kepala sekolah sebagai supervisor dengan guru adalah hubungan kolegial; pertemuan diskusi antara kepala sekolah sebagai supervisor dan guru adalah demokratis; sasaran supervisi terpusat pada kebutuhan dan aspirasi guru, serta tetap berada di dalam ruang lingkup tingkah laku guru mengajar secara aktual; pemberian umpan balik dilakukan berdasarkan data observasi yang cermat yang didasarkan atas kontrak, serta dilaksanakan dengan segera; serta mengutamakan inisiatif dan tanggung jawab guru, baik pada tahap perencanaan, pemberian umpan balik, bahkan pengambilan keputusan, dan tindak lanjut.

Pemenuhan prinsip-prinsip tersebut di atas membawa dampak bagi kedua belah pihak yaitu kepala sekolah sebagai supervisor berupa keyakinan akan kemampuan guru untuk mengembangkan dirinya serta menyelesaikan masalah yang dihadapi, kepemilikan sikap terbuka dan tanggap terhadap setiap pendapat guru, serta kemauan dan kemampuan memperlakukan guru sebagai kolega yang memerlukan bantuannya. Sedangkan implikasi bagi guru berupa perubahan sikap sebagai seseorang yang mampu mengambil inisiatif untuk menganalisis dan mengembangkan dirinya serta bersikap terbuka dan obyektif dalam menganalisis dirinya. Dampak yang positif ini dapat membantu keberhasilan kepala sekolah dalam melaksanakan supervisi selanjutnya.

Secara umum, terdapat dua teknik supervisi yaitu individual dan kelompok. Supervisi teknik individual dilakukan melalui observasi kelas yaitu kunjungan yang dilakukan oleh kepala sekolah sebagai supervisor untuk mengamati seorang guru yang sedang mengajar (Hosen, 2017). Tujuannya agar mendapatkan data tentang sesuatu yang terjadi dalam proses belajar mengajar, sebagai dasar kepala sekolah melakukan pembinaan terhadap guru. Hal yang perlu diperhatikan selama proses observasi kelas adalah suasana kelas, kesesuaian metode dengan materi pelajaran, penguasaan materi pelajaran, cara memotivasi siswa, perkembangan siswa dalam bentuk kognitif, afektif dan psikomotor serta aspek-aspek lain yang terkait dengan proses pembelajaran. Sedangkan teknik kelompok dilakukan dengan mengamati keseluruhan proses belajar mengajar dalam satu pertemuan kelas, mengamati aktivitas belajar mengajar secara keseluruhan, dan tidak berpartisipasi dalam proses belajar mengajar. Selanjutnya kepala sekolah

dapat melakukan diskusi dengan guru tersebut setelah kegiatan belajar mengajar selesai, kemudian kepala sekolah dapat memberikan saran-saran yang diperlukan kepada guru yang disupervisi (Windryani, 2019).

Sekolah Menengah Kejuruan (SMK) adalah salah satu bentuk satuan pendidikan formal yang menyelenggarakan pendidikan kejuruan pada jenjang pendidikan menengah. SMK mempersiapkan peserta didik untuk bekerja di bidang tertentu dan memiliki masa studi yang berlangsung selama tiga sampai empat tahun (Susanto, 2013). SMK terbagi menjadi dua jenis, yaitu negeri dan swasta, dan memiliki berbagai jurusan yang diminati oleh siswa, seperti Jurusan Multimedia, Animasi, Administrasi, Akuntansi, Farmasi, Pariwisata, Pelayaran, Teknik Mesin, Tata Boga, Elektro, dan lain-lain. Tentunya, sebagai sebuah satuan pendidikan SMK juga berhak memiliki kualitas pembelajaran yang baik. Oleh karena itu, kompetensi supervisi kepala sekolah tidak hanya harus diterapkan di sekolah secara umum namun juga sekolah vokasi yang salah satunya adalah SMK.

Berdasarkan beberapa pemaparan tentang tanggung jawab atau kompetensi supervisi kepala sekolah tersebut di atas, peneliti ingin melihat bagaimana supervisi kepala sekolah dilakukan di SMK. Sebagaimana yang kita ketahui bersama bahwa SMK memiliki metode pembelajaran yang berbeda dengan SMA karena lebih berfokus kepada keterampilan peserta didik. Maka dari itu, mungkin saja juga terdapat perbedaan metode supervisi yang dilakukan antara SMA dan SMK. Oleh karena itu, peneliti berminat untuk melakukan penelitian dengan mengangkat sebuah judul Implementasi Tanggung Jawab Supervisi Kepala SMK Negeri 1 Pedan Klaten.

## **METODE**

Penelitian ini dilakukan pada bulan Juni tahun 2024 atau lebih tepatnya bersamaan dengan acara workshop nasional yang diselenggarakan oleh S1 Teknologi Pendidikan FKIP UNS. Penelitian ini dilakukan di Aula Lantai 2 UNS Inn, Surakarta. Penelitian ini menggunakan desain kualitatif dengan teknik wawancara. Teknik wawancara dalam penelitian adalah metode pengumpulan data yang digunakan untuk mendapatkan informasi dari responden atau narasumber (Hansen, 2020). Data diperoleh dari responden atau narasumber yaitu kepala SMK Negeri 1 Pedan Klaten, Drs. Eko Subadri, M.M. Analisis data dilakukan secara deskriptif kualitatif. Analisis deskriptif kualitatif adalah teknik analisis data yang digunakan untuk mengumpulkan, mengolah, menganalisis, serta menyajikan data secara deskriptif (Lindawati & Hendri, 2016).

Langkah-langkah yang dilakukan dalam penelitian ini dimulai dengan menyusun instrumen pertanyaan. Instrumen pertanyaan yang digunakan berjumlah 8 butir pertanyaan seputar tanggung jawab supervisi kepala sekolah. Berikutnya, sebelum acara workshop dimulai, peneliti membuat kesepakatan dengan responden atau narasumber untuk melakukan wawancara setelah acara selesai. Selanjutnya, peneliti melakukan wawancara terstruktur dengan cara menanyakan pertanyaan yang telah dibuat dan merekam serta menulis jawaban responden atau narasumber untuk memperkecil tingkat kesalahan dalam pengumpulan dan analisis data yang akan dilakukan.

## **HASIL DAN PEMBAHASAN**

### *Results*

Berdasarkan hasil wawancara yang dilakukan kepada narasumber yaitu Drs. Eko Subadri, M.M. mengenai tanggung jawab supervisi kepala sekolah, diketahui bahwa narasumber telah melakukan supervisi tersebut di SMK Negeri 1 Pedan yang dipimpinnya. Beliau menyatakan bahwa beliau telah melaksanakan supervisi dengan tiga tahapan. Tahapan yang pertama adalah pembuatan perencanaan untuk supervisi. Dalam pembuatan perencanaan untuk supervisi ini, beliau melakukan pengecekan kesiapan perangkat pembelajaran dari guru yang akan disupervisi. Perangkat pembelajaran yang dimaksud meliputi program tahunan (Prota), program

semester (Promes), capaian pembelajaran (CP), alur tujuan pembelajaran (ATP), modul ajar, bahan ajar yang digunakan, media pembelajaran yang digunakan, dan lain sebagainya. Beliau ingin memastikan bahwa setiap guru yang mengajar di SMK Negeri 1 Pedan Klaten memiliki kesiapan dalam mengajar di kelas. Menurut beliau, salah satu kompetensi yang penting untuk dimiliki adalah kompetensi profesional. Kompetensi profesional adalah seperangkat kemampuan yang harus dimiliki oleh seorang guru agar ia dapat melaksanakan tugas mengajarnya dengan berhasil (Sulastri et al., 2020). Selain itu, dalam tahap pertama juga dilakukan penjadwalan pelaksanaan observasi dengan guru yang bersangkutan. Beliau akan mencari waktu yang tepat di mana kedua belah pihak bisa bertemu untuk melaksanakan program supervisi secara bersama-sama di kelas. Ditambah lagi, beliau melakukan wawancara pra supervisi sebelum melakukan supervisi. Wawancara ini bertujuan untuk mengetahui program-program pembelajaran yang dilaksanakan oleh guru sehingga beliau dapat membuat instrumen penilaian yang tepat untuk melakukan supervisi. Setelah melakukan tahap yang pertama, beliau melakukan tahap yang kedua yaitu pelaksanaan supervisi dengan mengamati secara langsung pembelajaran yang terjadi di dalam kelas. Dilanjutkan dengan tahap yang terakhir yaitu evaluasi dan tindak lanjut yang berperan penting dalam program supervisi. Beliau melakukan wawancara pasca supervisi untuk menanyakan beberapa hal mengenai kegiatan-kegiatan pembelajaran yang telah dilakukan dan juga melakukan diskusi sebagai tindak lanjut dari kegiatan supervisi.

Pelaksanaan supervisi yang dilakukan di SMK Negeri 1 Pedan Klaten dilakukan dalam bentuk non formal dan formal. Pada bentuk non formal, supervisi dilakukan setiap saat untuk memastikan bahwa pembelajaran yang dilakukan sudah sesuai dengan standar yang ditetapkan. Sedangkan pada bentuk formal, supervisi dilakukan setiap semester minimal satu kali. Sehingga dalam satu tahun ajaran, setidaknya dilaksanakan dua kali supervisi untuk guru. Kadangkala, pelaksanaan supervisi yang terprogram tidak dilakukan oleh beliau sendiri. Akan tetapi, beliau juga membentuk sebuah tim supervisor yang terdiri dari manajemen sekolah seperti wakil kepala sekolah, guru senior yang dianggap telah memiliki banyak pengalaman mengenai pelaksanaan pembelajaran di kelas, dan karena ini merupakan SMK maka terdapat juga tim supervisor dari kepala program keahlian dari setiap keahlian yang ada di SMK Negeri 1 Pedan Klaten.

Selama beliau melakukan supervisi, tidak banyak cerita unik yang dapat beliau bagikan kepada peneliti. Akan tetapi, sebagaimana umumnya, guru biasanya cenderung grogi ketika disupervisi. Bisa jadi ketika melakukan pembelajaran seperti biasa, guru tersebut sangat menikmati pembelajaran. Akan tetapi, ketika dilakukan supervisi maka terlihat bahwa guru tersebut tidak terlalu luwes sebagaimana biasanya karena keberadaan supervisor di kelas. Beliau melanjutkan, yang perlu diperhatikan oleh guru saat ini adalah bahwa program supervisi adalah sebuah kegiatan rutin dalam rangka peningkatan kualitas pembelajaran di SMK Negeri 1 Pedan Klaten. Sehingga terjadi pergeseran paradigma dari supervisor, bukan untuk menjustifikasi keberhasilan guru tersebut namun lebih mengarah kepada pendampingan akademik dan bimbingan intensif terhadap permasalahan-permasalahan belajar yang mungkin terjadi. Hal tersebut penting sehingga diharapkan seorang supervisor tidak mencari-cari kesalahan yang disupervisi namun mencari penyelesaian dari masalah-masalah yang muncul selama pembelajaran.

Untuk meningkatkan orisinalitas dalam program supervisi, maka guru tidak diminta untuk membuat skenario untuk memberikan kesan positif selama supervisi. Guru hanya diminta untuk menyiapkan hal-hal yang diperlukan dalam pembelajaran secara lebih baik sehingga tidak terdapat hal-hal yang tidak diinginkan seperti ketidaksiapan bahan ajar dan masalah teknis yang lainnya. Guru diminta mengikuti skenario pembelajaran sebagaimana yang telah dituliskan dalam modul ajar. Dengan demikian, supervisor dapat menilai kesesuaian rencana dengan alur pembelajaran yang dilaksanakan oleh guru yang disupervisi. Beliau juga menjelaskan bahwa hal-

hal yang biasanya menjadi perbaikan dari hasil supervisi adalah metode dan strategi pembelajaran. Metode dan strategi pembelajaran yang digunakan harus membuat suasana kelas menjadi aktif dan menyenangkan (Fanani, 2014). Untuk mencapai hal tersebut, guru perlu membangun komunikasi yang baik dengan siswa. Komunikasi adalah salah satu kunci dalam keberhasilan pembelajaran di kelas.

Di akhir sesi wawancara, beliau menutup diskusi dengan memberikan beberapa tips dan tricks yang dapat dilakukan oleh supervisor ketika melakukan supervisi di kelas. Hal yang menurut beliau sangat penting untuk dilakukan adalah membangun komunikasi dengan guru. Kunci keberhasilan dari supervisi adalah keberhasilan pembangunan komunikasi dengan guru. Apabila komunikasi sudah terbangun dengan baik, maka supervisi dapat dilakukan tanpa hambatan. Guru juga menjadi lebih terbuka sehingga supervisor dapat benar-benar memahami kebutuhan dan kondisi guru tersebut. Pada bagian yang lain, pembuatan komitmen juga penting karena dibutuhkan kesepahaman antara supervisor dan guru mengenai tujuan dari pelaksanaan supervisi tersebut berkaitan dengan kualitas sekolah. Supervisor tidak boleh juga bertindak semena-mena terhadap guru yang disupervisi dan harus memaanusiakan manusia. Memeanusiakan manusia di sini berarti supervisor harus tetap menjaga kehormatan dari guru yang disupervisi di luar profesionalisme yang harus dipegang teguh tanpa adanya subyektivitas. Masukan yang diberikan oleh supervisor harus diberikan setelah kegiatan belajar mengajar (KBM) selesai sehingga tidak terkesan mengganggu KBM atau mungkin mengubah prespektif siswa terhadap guru yang sedang disupervisi. Beliau atau tim supervisor yang melakukan supervisi individual atau langsung di kelas akan membuat forum diskusi dalam menyelesaikan masalah pembelajaran yang terjadi bersama-sama dengan kedua belah pihak yaitu supervisor dan guru.

#### *Discussion*

Berdasarkan pemaparan hasil wawancara peneliti dengan kepala SMK Negeri 1 Pedan Klaten tersebut di atas, terdapat beberapa hal yang bisa dianalisis dari kelebihan dan kekurangan program supervisi yang dilakukan. Hal yang menjadi kelebihan dari supervisi yang dilakukan di SMK Negeri 1 Pedan Klaten adalah adanya prosedur yang jelas dalam pelaksanaan program supervisi di sekolah tersebut. Kepala sekolah telah merancang sebuah standar dalam melaksanakan supervisi terhadap guru-guru yang mengajar di SMK Negeri 1 Pedan Klaten. Beliau telah benar-benar memahami esensi dari supervisi yang menandakan bahwa beliau telah memiliki kompetensi supervisi yang harus dimiliki oleh kepala sekolah. Kompetensi ini penting untuk mengembangkan profesi berkelanjutan dari guru-guru di SMK Negeri 1 Pedan Klaten (Yusuf & Jamali, 2019). Supervisi di sekolah ini juga menekankan terhadap perbaikan mutu pembelajaran, tidak hanya kepada pencarian kesalahan guru-guru sebagaimana kesan supervisi pada umumnya. Satu hal lagi yang menjadi kelebihan dari supervisi yang dilakukan oleh beliau adalah bahwa pentingnya membangun hubungan komunikasi yang baik antara supervisor dan guru sehingga terjadilah sebuah kegiatan supervisi yang tepat sasaran atau sesuai tujuan.

Secara umum, apabila kita cermati maka hamper tidak ada kekurangan dalam kegiatan supervisi tersebut. Mungkin hal yang bisa hanya bersifat sebagai saran adalah bagaimana cara menjaga kompetensi dari tim supervisor yang dibentuk. Sebagaimana yang telah dipaparkan di atas bahwa terdapat pembentukan tim supervisor untuk membantu kerja kepala sekolah dalam melakukan supervisi guru. Pertanyaannya adalah apakah mereka benar-benar berkompeten dalam hal tersebut. Apabila jawabannya adalah iya, bagaimanakah kita menguji kompetensi mereka dalam menjadi supervisor. Apabila kedua pertanyaan tersebut bisa terjawab, maka tidak ada salahnya membentuk tim supervisor tersebut. Hal ini penting karena tanggung jawab supervisi tersebut sebenarnya adalah tanggung jawab dari kepala sekolah (Ichda & Mustiningsih, 2023). Sehingga keberadaan tim supervisor harus benar-benar diperhatikan dengan baik. Jangan sampai karena alasan kegiatan supervisi yang padat menjadi mengorbankan kualitas dari

kegiatan supervisi tersebut baik dari segi validitas penilaian hasil supervisi maupun obyektivitas dari tim supervisor.

## KESIMPULAN

Kesimpulan dari penelitian ini adalah bahwa sudah diterapkannya kegiatan supervisi yang dilakukan oleh kepala SMK Negeri 1 Pedan Klaten. Kepala sekolah tersebut benar-benar memiliki dan memahami kompetensi supervisi sebagai salah satu dari lima kompetensi yang harus dimiliki oleh seorang kepala sekolah. Tujuan dari supervisi yang dilakukan di SMK Negeri 1 Pedan Klaten adalah untuk menjaga kualitas pembelajaran di sekolah tersebut. Penelitian lebih lanjut yang akan dilakukan dapat membahas tentang bagaimana hasil atau dampak supervisi yang dilakukan oleh kepala sekolah terhadap kinerja dan motivasi guru.

## KONFLIK KEPENTINGAN

Tidak ada konflik kepentingan.

## UCAPAN TERIMAKASIH

Ucapan terima kasih ditujukan kepada Drs. Eko Subadri, M.M. sebagai narasumber penelitian ini dan Dr. Eka Budhi Santosa, M.Pd. sebagai dosen pengampu mata kuliah manajemen dan kepemimpinan kepala sekolah S2 Teknologi Pendidikan FKIP UNS.

## REFERENSI

- Aprida, Y., Fitria, H., & Nurkhalis. (2022). Pengaruh Supervisi Akademik Kepala Sekolah dan Motivasi Kerja Guru Terhadap Kinerja Guru. *Journal of Innovation in Teaching and Instructional Media*, 2(3), 181–184. <https://doi.org/10.52690/jitim.v2i3.303>
- Fanani, A. (2014). Mengurai Kerancuan Istilah Strategi dan Metode Pembelajaran. *Nadwa: Jurnal Pendidikan Islam*, 8(2), 171–192. <https://doi.org/10.21580/nw.2014.8.2.576>
- Hansen, S. (2020). Investigasi Teknik Wawancara dalam Penelitian Kualitatif Manajemen Konstruksi. *Jurnal Teknik Sipil*, 27(3), 283. <https://doi.org/10.5614/jts.2020.27.3.10>
- Hosen, A. (2017). Pelaksanaan Teknik Supervisi Individual Sebagai Implementasi Kerja Kepala Sekolah di SMA N 2 Pasaman. *Jurnal Manajemen Pendidikan*, 2(1), 1–10.
- Ichda, M. A., & Mustiningsih, M. (2023). Studi Literasi Kompetensi Supervisi Kepala Sekolah terhadap Kinerja Guru di Dunia Pendidikan. *JIIP - Jurnal Ilmiah Ilmu Pendidikan*, 6(4), 2188–2195. <https://doi.org/10.54371/jiip.v6i4.1401>
- Lindawati, S., & Hendri, M. (2016). Penggunaan Metode Deskriptif Kualitatif Untuk Analisis Strategi Pengembangan Kepariwisata Kota Sibolga Provinsi Sumatera Utara. *Seminar Nasional APTIKOM (SEMNASTIKOM), Hotel Lombok Raya Mataram*, 833–837.
- Raberi, A., Fitria, H., & Fitriani, Y. (2020). Pengaruh Supervisi Kepala Sekolah dan Peran Komite Sekolah Terhadap Kinerja Guru. *Jurnal Al-Qiyam*, 1(1), 11–20. <https://doi.org/10.33648/alqiyam.v1i1.123>
- Ramadhan, A. (2017). Pengaruh Pelaksanaan Supervisi Akademik Pengawas Sekolah Dan Supervisi Kepala Sekolah Terhadap Kinerja Guru SMK Negeri Di Kabupaten Majene. *Journal of Educational Science and Technology (EST)*, 3(2), 136. <https://doi.org/10.26858/est.v3i2.3579>
- Rismawan, E. (2017). Pengaruh Supervisi Kepala Sekolah Dan Motivasi Berprestasi Guru Terhadap Kinerja Mengajar Guru. *Jurnal Administrasi Pendidikan*, 12(1), 114–132. <https://doi.org/10.17509/jap.v22i1.5925>
- Sanglah, I. N. (2021). Peningkatan Kinerja Guru Melalui Supervisi Kepala Sekolah pada Sekolah Dasar. *Jurnal Pedagogi Dan Pembelajaran*, 4(3), 528. <https://doi.org/10.23887/jp2.v4i3.40700>
- Sulastri, S., Fitria, H., & Martha, A. (2020). Kompetensi Profesional Guru dalam Meningkatkan

- Mutu Pendidikan. *Journal of Education Research*, 1(3), 258–264.  
<https://doi.org/10.37985/jer.v1i3.30>
- Susanto, H. (2013). Faktor-Faktor Yang Mempengaruhi Kinerja Guru Sekolah Menengah Kejuruan. *Jurnal Pendidikan Vokasi*, 2(2), 197–212. <https://doi.org/10.21831/jpv.v2i2.1028>
- Windryani, F. (2019). Pentingnya Kepala Sekolah Mengetahui Teknik-Teknik Supervisi Dalam Rangka Meningkatkan Kinerja Guru. *INA-Rxiv Papers*, 1(1), 1–6.
- Yusuf, M., & Jamali, Y. (2019). Kompetensi supervisi kepala sekolah Dalam pengembangan keprofesian berkelanjutan. *SUSTAINABLE: Jurnal Kajian Mutu Pendidikan*, 2(1), 1–22.  
<https://doi.org/10.32923/kjimp.v2i1.979>