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Strategy to Improve Training Quality in PPSDM Migas: Approach to Educational Aspects, Facilities, and Services

Yusran Hedar[1], Mario Emilzoli[2*], Ai Pemi Priandani[3], Mohd Lokman Abdullah[4]

[1]Pusat Pengembangan Sumber Daya Manusia Minyak dan Gas
Kementerian ESDM, Indonesia
[2,3]Universitas Pendidikan Indonesia
Jawa Barat, Indonesia
[4]Open University Malaysia
Kuala Lumpur, Malaysia
✉ emilzoli@upi.edu*

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Abstract

Background: Improving the quality of training delivery in the oil and gas sector is a strategic necessity in the face of global energy transition and technological disruption. As a technical training institution under the Ministry of Energy and Mineral Resources, PPSDM Migas must ensure that its training programs remain relevant, effective, and responsive to participants' needs.
Aims: This research aims to develop a strategic framework for enhancing training quality at PPSDM Migas through evaluative analysis across three core aspects: educational content, facilities, and services.
Methods: An evaluative quantitative research design with qualitative support was employed, involving 1,539 training participants through total sampling. Data were collected using structured questionnaires assessed for validity through pilot testing. Analysis included descriptive statistics, gap analysis, SWOT mapping, and the PDCA model to formulate improvement strategies.
Results: The findings revealed performance gaps in all aspects, particularly in facilities (gap = -3.35). The gap analysis and participant feedback identified specific weaknesses such as poor ICT infrastructure and lack of interactivity. SWOT analysis and PDCA were used to recommend targeted strategies including ICT upgrades, training material redesign, and service digitization.
Conclusion: The resulting strategy framework supports continuous training improvement and reinforces PPSDM Migas's role as a future-ready institution. The research contributes to the literature on evaluation-based quality development and opens avenues for further research on adaptive training innovations in technical education.

A. Introduction

Training and development of human resources (HR) is a fundamental element in supporting organizational performance, especially in strategic sectors such as the oil and gas industry (Urbancová et al., 2021). In the context of Indonesia, the oil and gas sector plays a vital role as one of the backbones of the national economy and a significant source of state revenue (Maharani & Akbar, 2023). Therefore, the existence of human resources who are professional, adaptive to industrial dynamics, and have adequate technical and managerial competence is a necessity.

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The Oil and Gas Human Resources Development Center (PPSDM Migas) under the auspices of the Ministry of Energy and Mineral Resources (ESDM) has a mandate to produce and develop superior human resources in this sector (Dratistiana & Kusuma, 2023; Sitompul & Suharyadi, 2024). In carrying out its duties, PPSDM Migas organizes various training programs aimed not only at the State Civil Apparatus (ASN) within the ESDM but also for the general public around the oil and gas operation area (Khuzaifah, 2024). The two main programs to focus on in 2024 are ASN Professionalism Index Training (IP ASN) and Community Development. These two programs are designed to provide increased knowledge, technical skills, and professional attitudes needed in carrying out tasks and functions in the oil and gas sector.

However, the effectiveness of the training program is highly dependent on the quality of the implementation, which includes three main aspects: educational content, facilities, and services (Iqbal et al., 2024; Ramadhon et al., 2023; Ulpah et al., 2022). These three aspects are the main determinants in creating a meaningful and impactful learning experience. In the realm of education and training, this approach is in line with learning system theory, which emphasizes the importance of interacting learning components, including content, learning environment, and administrative support (Akintayo et al., 2024; Marougkas et al., 2023).

According to the evaluation report on the implementation of PPSDM Migas training in 2024, there are variations in training quality achievements between online and offline methods, as well as between implementation locations in Cepu and outside Cepu. Training held offline generally gets higher ratings on all three aspects compared to online training. This assertion is in line with the theory of media richness conveyed by Daft and Lengel that face-to-face media has the advantage of conveying complex information and providing a stronger interactive experience (Bjorvatn & Wald, 2019; Xiao et al., 2021). Additionally, a study conducted by Bagheri & Mohamadi Zenouzagh (2021), Lewohl (2023), and Mulaimović et al. (2024), on the comparison of training conducted online and offline emphasized that online trainees tend to have lower levels of engagement and motivation compared to face-to-face training, especially when they are not supported by an interactive learning system and adequate technological facilities.

The urgency of this research rests on the real need to improve the quality of training at PPSDM Migas based on the results of empirical evaluation. Data shows that the average assessment of participants on educational aspects, facilities, and services in online training still does not fully meet the Community Satisfaction Index (IKM) target of 90.00. In particular, the educational and facilities aspects showed average scores below the target, indicating a gap between the expectations and reality of training implementation. Some trainings even earned scores below the "Good" category, indicating the need for strategic interventions that are not only technical but also systemic.

Various alternative solutions can be considered in dealing with this problem. First, revise the instructional design by adjusting the curriculum and learning methods based on the needs of participants and the characteristics of the material (Abuhassna & Alnawajha, 2023; El-Sabagh, 2021; Rao, 2021). Second, increasing the capacity of teachers, both in terms of mastery of digital learning technology and engaging material delivery strategies (Ahmad et al., 2022; Alieto et al., 2024). Third, improving physical and digital facilities, especially to support online training that requires qualified network infrastructure and interactive learning media (Fanani, 2023; Hanayanti & Ikhawan, 2022; Iqbal et al., 2024). Fourth, improving the quality of administrative services through the digitization of the training information system and an integrated participant feedback system (Borisenkov et al., 2021; Dias et al., 2022; Kalimullina et al., 2021).

However, the solution chosen in this research is more focused on developing strategies to improve the quality of training based on an evaluative approach to the three main aspects of training implementation: educational, facilities, and services. This approach is considered the most appropriate because it touches on fundamental aspects that directly affect the learning experience of participants. Thus, the strategy developed will be comprehensive and applicative and based on actual data and analysis of the results of the evaluation of PPSDM Migas training in 2024.

The purpose of this research is to formulate a strategy to improve the quality of training organized by PPSDM Migas through an evaluative approach to educational aspects, facilities, and services. The resulting strategy contributes not only to improving the future effectiveness of training programs but also to reinforcing the institutional capacity of PPSDM Migas as a benchmark in oil and gas human resource development. Specifically, the research offers an integrated model that combines quantitative gap analysis, SWOT mapping, and the PDCA cycle, an approach that has not yet been widely applied in public-sector training institutions in Indonesia. This integrative framework enables evidence-based decision-making for continuous improvement. Academically, the article advances the discourse on training evaluation by

demonstrating how mixed-method data and strategic planning tools can be aligned to generate actionable insights. Practically, it offers a replicable model for other government and industry-based training centers seeking to modernize their programs amidst challenges of globalization, digital transformation, and dynamic workforce demands.

B. Research Methods

This research is an evaluative descriptive research that aims to examine the results of training at PPSDM Migas in 2024 (January-December). In addition, this research aims to formulate a strategy to improve the quality of training based on three main aspects, including educational aspects, facility aspects, and service aspects as criteria in the evaluation of training implementation in the PPSDM Migas. The evaluation was carried out on two main training programs carried out by PPSDM Migas, namely the State Civil Apparatus Professionalism Index (IP ASN) Training and Community Training. This research uses a quantitative approach with the support of quantitative (participant satisfaction survey) and qualitative data derived from participant input, documentation, and field observation.

Type of Research

This research uses a program evaluation approach with a comparative descriptive design. The data was analyzed to determine the difference in training quality achievement between the implementation method (online and offline) and the implementation location (Cepu and outside Cepu). The assessment was carried out on three main aspects developed based on the construction of the evaluation of the quality of training services that have been determined by PPSDM Migas, namely: educational aspects, facility aspects, and service aspects.

Population and Sample

The population in this research is all participants in IP ASN training and community training organized by PPSDM Migas throughout 2024. The total number of participants in this research is presented in Table 1.

Table 1. Research population

No	Types of Training	Number of Training	Number of Participants	Implementation Method	Implementation Location
1	ASN IP Training	14 activities	765 people	Online & Offline	Cepu
2	Community Training	32 activities	774 people	Offline	Cepu, Bandung, Yogyakarta
	Total	46 Activities	1,539 people		

The samples in this research were taken using the total sampling technique. This is because all data comes from respondents who are actively involved in the training program and have filled out an evaluation questionnaire provided by the organizer. Thus, this research is a census (total population sampling), which allows descriptive analysis to be carried out thoroughly and representatively of all training activities in that year.

Time of Research

The research was conducted throughout the year of 2024, encompassing all training sessions, both online and offline, held at PPSDM Migas in Cepu, Central Java. The evaluation process occurred concurrently with training activities, and data collection was finalized by December 2024.

Research Procedures

In its implementation, this research is carried out through 6 stages or procedures as presented in Table 2.

Table 2. Research procedure

No	Stages	Description
1	Preliminary Study (Kirchner et al., 2022)	Study of documents related to training programs, evaluation guidelines, and IKM targets
2	Instrument Arrangement (Zohrabi, 2013)	Questionnaire design based on educational aspects, facilities, and services

No	Stages	Description
3	Instrument Validation (Zohrabi, 2013)	Test the validity of the content through review by training experts and educational evaluation experts.
4	Data Collection (Aguinis et al., 2021)	Distribution of questionnaires to all IP ASN training participants and the community.
5	Data Analysis (Praveena K.R. & Sasikumar S, 2021)	Processing and interpretation of quantitative data and qualitative data extraction from participant inputs
6	Preparation of Recommendations	Formulation of improvement strategies based on relevant evaluation results and theories.

Data Collection Techniques

Data collection was carried out through, first, an electronic questionnaire filled out by participants after the training; second, documentation in the form of a recapitulation of the results of the evaluation and the value of IKM achievements per training; and third, brief interviews and field observations of several offline trainings in Cepu and outside Cepu (Bandung, Semarang, and Yogyakarta), especially for the strengthening of qualitative data. Before the full-scale data collection, a pilot test was conducted involving 30 participants from a similar training program held in early 2024. The purpose was to assess the clarity, reliability, and validity of the survey instrument.

Research Instruments

Before analyzing the data and formulating strategies to improve training quality, this research required a well-constructed instrument capable of accurately measuring participants' perceptions and experiences regarding the training implementation. These instruments were designed to capture various dimensions of training quality in an objective, systematic, and relevant manner aligned with the goals of program evaluation (Ambu-Saidi et al., 2024).

To ensure the validity and reliability of the measurement tools, a pilot test was conducted with 30 participants who attended a similar training program at PPSDM Migas in early 2024. This pilot phase aimed to assess the clarity of the questionnaire items, the internal consistency of the scales, and their relevance to the actual training context. Based on the feedback, minor revisions were made to improve the clarity and alignment of the statements. The revised instrument demonstrated strong reliability, with a Cronbach's alpha score of 0.86, indicating high internal consistency and suitability for broader use.

Therefore, in this research, two main types of instruments are used, designed to answer two key objectives: (1) evaluating the quality of training implementation based on three main aspects (educational, facilities, and services), and (2) developing improvement strategies based on the evaluative findings. The research instruments used in this research are as follows:

1. Educational Aspects: including the schedule and duration of the training, the relevance of the material, the suitability of the pretest and posttest, and the learning method.

2.Facility Aspects: including the completeness of facilities, cleanliness, classroom comfort, ICT facilities, and internet connection.

3. Service Aspects: includes the registration process, clarity of information, consumption, communication, and administrative assistance.

Each of the above aspects was assessed using a 5-point Likert scale, with a score range of 1 (strongly disagree) to 5 (strongly agree). Furthermore, the instruments used to formulate strategies to improve the quality of training refer to the following (Setiowati et al., 2024):

1. Gap Analysis Tool: identifies the difference between actual value and quality target (IKM).

2. Priority Issue Checklist: groups indicators with low scores or negative feedback from participants.

3. Simple SWOT Matrix: describes the strengths, weaknesses, opportunities, and threats of the training.

4. PDCA (Plan-Do-Check-Act) framework: develop an iterative and continuous improvement strategy.

Analysis Plan

The data of this research was analyzed using descriptive quantitative techniques and comparative analysis. The stages of analysis include the following:

1. Descriptive analysis of statistics. Calculation of average scores on each aspect (educational, facilities, services) for each type of training (online and offline).
2. Comparative analysis. Comparison of evaluation results based on location (Cepu and outside Cepu).
3. Gap Analysis. Measuring the achievement of the IKM target with a minimum benchmark of 90.01.
4. Grouping of training by quality category:
   a. ≥ 95: Very Good
   b. 90–94.99: Good
   c. 80–89.99: Enough
   d. < 80: Less
5. Synthesis of strategy. Triangulation of quantitative data with qualitative data, in the form of participant input to strengthen the interpretation of results and underlie the formulation of improvement strategies.

To understand more details about the research methods applied in this research, it is presented in Figure 1.

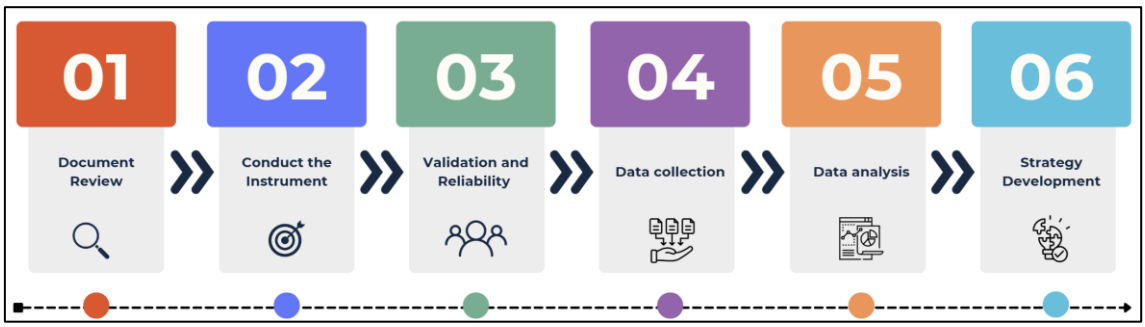

Figure 1. Stages of research data analysis

Scope and Limitation of Research

The scope of this research was limited to the evaluation of training implementation quality from the participant perspective. While comprehensive, it did not include longitudinal data (i.e., post-training performance in the workplace). Moreover, due to the nature of institutional data, contextual variations among training types were not analyzed separately.

C. Results and Discussion

1. Results

Educational Aspects

The educational aspect is an aspect related to the schedule and duration of the event, the learning materials or materials provided, and the suitability of the pretest and posttest with the material provided. Based on the survey results obtained through the distribution of instruments distributed to the trainees who participated in the training activities, in general, the results as presented in Figure 2 were obtained.

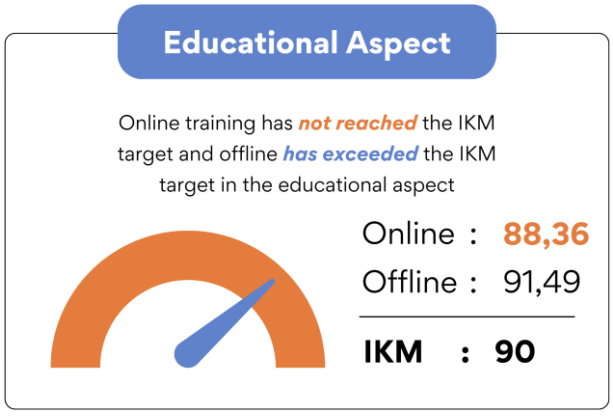

Figure 2. Participants' assessment of educational aspects in the context of IKM achievements

From the data, it can be seen that offline training has exceeded the IKM target, while online training has not reached the set quality standards. This indicates that the quality of learning implementation in online training is still below participants' expectations and below the minimum satisfaction target. Sub-indicators that scored relatively lower in online training included

1. The relevance of the material to the needs of the participants;
2. Compatibility between learning objectives and methods and evaluations;
3. Interactivity of learning methods.

Feedback from online training participants also revealed that some materials were too general or out of context with the participants' field of work, delivery tended to be one-way, and there was a lack of time for hands-on discussion or practice. In the context of IP ASN training held offline, there are other parameters that are measured, namely how the results of the assessment between training activities carried out in Cepu and training activities carried out outside Cepu, such as in Semarang, Yogyakarta, and Bandung. Based on the data obtained, the results of the assessment show that the implementation of IP ASN training activities carried out outside Cepu shows higher results than those carried out in Cepu, as presented in Figure 3.

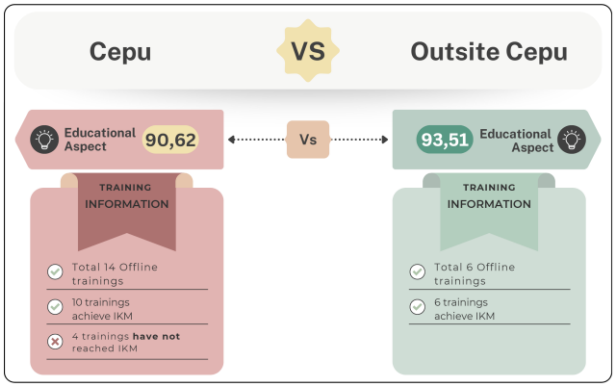

Figure 3. Comparison of offline educational aspects assessment in Cepu and Outside Cepu

Facility Aspects

Facility aspects are aspects related to the completeness of facilities, cleanliness of facilities, learning facilities related to information technology, classroom comfort, and service standards for technical learning facilities. Based on the results of the survey obtained through the distribution of instruments distributed to participants who participated in training activities, in general the results were obtained as presented in Figure 4.

Figure 4. Participant assessment on the aspect of facilities in the context of IKM achievements

The average value of the aspect of ASN IP training facilities that are carried out online is 86.65. Although it is in the good category, it has not reached the IKM target. In addition, the assessment of the aspect of this facility is still lower than the IP ASN training, which is carried out offline and reaches a score of 90.85. Of the 21 online training titles held, there are 16 titles that have not reached the IKM target and 5 titles that have reached the IKM target. This shows that although overall online training is considered good and very good, there are still some training that needs to be improved in terms of the facility aspect, especially to

achieve the IKM target as expected. The inputs and notes that need to be considered in online training are as follows:

1. Stability and speed of internet connection;
2. The quality of digital learning platforms or media;
3. Easy access to training materials and documents.

For offline training, although overall satisfactory, participants still provided a number of inputs, including:

1. Cleanliness of toilets and restrooms;
2. Less than optimal air conditioning and audio quality in some locations;
3. Limited training equipment.

In addition, the assessment of participants who participated in offline training outside Cepu, such as in Bandung and Yogyakarta, gave a higher rating than the training in Cepu, especially on the comfort of space and access to supporting facilities. In the context of IP ASN training held offline, there are other parameters that are measured, namely how the results of the assessment between training activities carried out in Cepu and training activities carried out outside Cepu such as in Semarang, Yogyakarta, and Bandung. Based on the data obtained, the results of the assessment show that the implementation of IP ASN training activities carried out outside Cepu reveals higher results than those carried out in Cepu as presented in Figure 5.

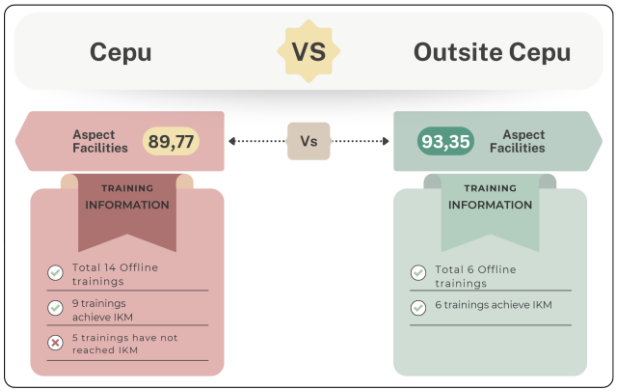

Figure 5. Comparison of offline facility aspect assessments in Cepu and Outside Cepu

The service aspect is an aspect related to the services provided by the organizer to the training participants. Based on the results of the survey obtained through the distribution of instruments distributed to the trainees who participated in the training activities, in general, the results were obtained as presented in Figure 6.

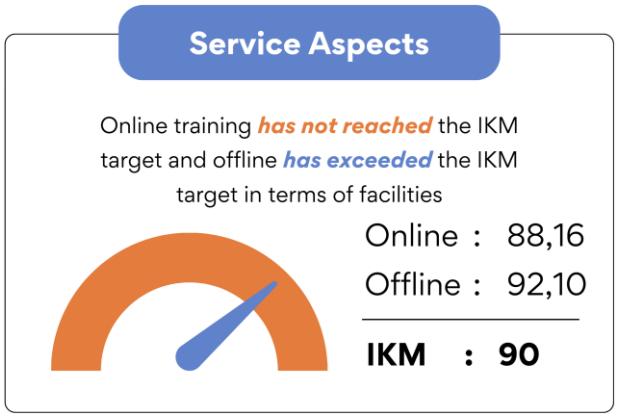

Figure 6. Participant assessment on service aspects in the context of IKM achievements

The average value of the aspect of ASN IP training facilities that were carried out online was 88.16. This data has not exceeded the IKM target. This value is still lower than the IP ASN training which is carried out offline which reaches a score of 92.10. Of the 21 online training titles held, there are 6 titles that have reached the IKM target and 15 titles have not reached the IKM target. This shows that overall online training has not reached IKM. Therefore, it is necessary to make improvements in terms of service aspects. Based on this data, it can be identified that offline training has exceeded the IKM target, while online training has

not met the service quality target. The records of online training participants who have not met the service quality target are as follows.

1. Clarity of technical and administrative information prior to training.
2. Timeliness in responding to participants' questions.
3. Easy access to technical assistance services during training.

For offline training, even though the score showed a high score, participants provided several notes, including:

1. Registration process that is still manual or slow;
2. Inconsistency of information with actual training schedules;
3. Consumption and logistics services are not evenly distributed between locations.

In the context of IP ASN training held offline, there are other parameters that are measured, namely how the results of the assessment between training activities carried out in Cepu and training activities carried out outside Cepu such as in Semarang, Yogyakarta, and Bandung. Based on the data obtained, the results of the assessment show that the IP ASN training activities held outside Cepu, especially in the service aspect, show higher results than those carried out in Cepu as presented in Figure 7.

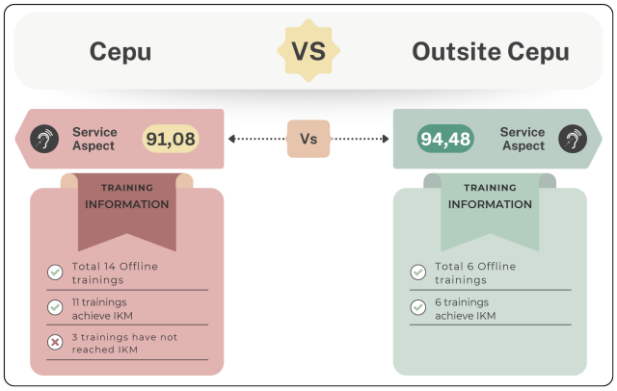

Figure 7. Comparison of offline service aspect assessments in Cepu and Outside Cepu

Strategies to Improve the Quality of Training

Gap analysis

An in-depth evaluation of the educational aspects, facilities, and services in the training organized by PPSDM Migas in 2024 shows that there is a difference in quality achievement between online and offline training. Consistently, offline training has exceeded the Community Satisfaction Index (IKM) target in all aspects, while online training has not met the set standards. These findings support that there are structural and systemic challenges that must be addressed through training quality improvement strategies that are not only technical, but also adaptive to the changes and complexity of trainee needs.

As a first step, gap analysis is u\sed to map the difference between the actual value and the target IKM. The following Table 3 presents a summary of the results of the analysis:

Table 3. Gap Analysis Matrix and Direction of Improvement Strategy

No	Aspects	IKM Online	SD Online	IKM Offline	SD Offline	Target IKM	Gap Online	p-value	Key Issues	Strategy Direction
1	Educational	88,36	4.12	91,49	3.76	90,00	-1,64	0.013	Material not as needed, monotonous method	Revision of learning design, facilitator training
2	Facilities	86,65	5.08	90,85	4.21	90,00	-3,35	0.001	Unstable connection, media	ICT strengthening, platform

No	Aspects	IKM Online	SD Online	IKM Offline	SD Offline	Target IKM	Gap Online	p-value	Key Issues	Strategy Direction
3	Service	88,16	4.89	92,10	3.85	90,00	-1,84	0.010	not interactive Unclear information, slow response	quality improvement Digitization of services, responsive SOPs

The gap analysis results indicate that the facilities aspect has, particularly in online training uncovers the widest discrepancy. Nevertheless, all aspects require strategic interventions to ensure training quality that is both equitable and sustainable. To guide the improvement efforts, a simple SWOT analysis was also carried out to identify the strategic position of PPSDM Migas in internal and external contexts.

Strategy Design Based on SWOT Analysis

In order to enrich perspectives in strategy formulation, it is not enough to rely only on quantitative data based on the results of gap analysis. Therefore, the analysis is followed by mapping internal and external conditions through a simple SWOT analysis. This step aims to identify strengths, weaknesses, opportunities, and threats that are relevant to the context of conducting training at PPSDM Migas.

Based on the SWOT analysis conducted, it was found that PPSDM Migas has a number of strengths, including institutional reputation and experienced trainer human resources. However, weaknesses such as the unpreparedness of the digital system, lack of innovation in learning methods, and services that have not been digitized are significant obstacles in the context of online training. The opportunity arises precisely from the global trend of digitizing education and increasing demand for flexible training, while threats come from technology-based private competitors and ever-increasing participant expectations. For more clarity, a simple SWOT analysis is presented in Figure 7.

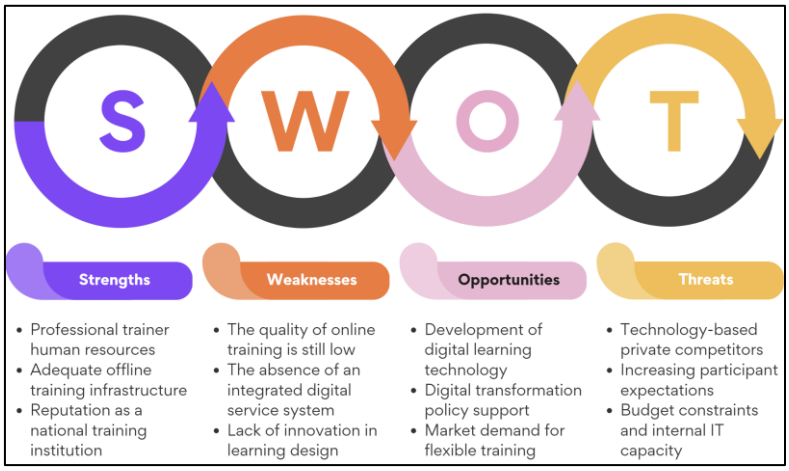

Figure 7. SWOT Matrix of Oil and Gas PPSDM Training Strategy

The results of the SWOT mapping are not only useful to identify the strategic position of PPSDM Migas, but also to formulate improvement strategies in a more systemic and dynamic manner. For this reason, the strategy is derived more operationally through the PDCA (Plan-Do-Check-Act) approach ensure in a realistic and measurable continuous improvement cycle (Gong et al., 2024) In this case, the PDCA approach provides a framework that allows for the implementation of the strategy in stages, with planned starting points (plan), execution (do), monitoring results (checks), and continuous improvement (act). The resulting strategy integrates the results of the evaluation, gap, and SWOT into concrete steps as presented in Table 4.

Table 4. PDCA Cycle-Based Training Quality Improvement Strategy

No	Stages	Description
1	Plan	• Developing quality standards for online and offline training based on blended learning • Establish digital participant service indicators

No	Stages	Description
		• Conduct an audit of ICT readiness, materials, and human resources for online training
2	Do	• Implement an interactive Learning Management System (LMS) for online training • Provide training to facilitators on active methods and use of digital media • Implementing SOPs for technology-based participant services (chatbots, helpdesks, automatic notifications)
3	Check	• Re-measuring post-training SMEs and conducting micro-feedback surveys per aspect • Evaluate the competency of learning outcomes and the effectiveness of the methods used
4	Act	• Improve learning design, strengthen digital systems and add participant service features • Build a real-time data-driven training quality dashboard for monitoring and rapid decision-making

2. Discussion

The findings of this research reaffirm the significant discrepancy between the quality perceptions of offline and online training formats in professional settings. Offline training consistently demonstrates superior performance, underscoring the enduring strength of face-to-face interaction, immediate feedback, and immersive learning experiences. This is aligned with the Media Richness Theory, which posits that face-to-face communication remains the most effective medium for delivering complex information and ensuring interactive learning (Bjorvatn & Wald, 2019; Xiao et al., 2021). In contrast, the limitations found in online training delivery, particularly in content relevance and interactivity are consistent with previous studies that emphasize the risks of passive learning and disengagement in poorly designed online formats (Badali et al., 2022; Shao & Chen, 2020; Skulmowski & Xu, 2022).

These gaps also reflect weaknesses in the instructional design of online training programs. Low participant ratings on the relevance of materials and monotony of methods indicate a lack of needs assessment in the planning phase. According to Goodyear et al. (2021), an effective instructional design process must begin by identifying the participants' characteristics and aligning the content with their job contexts. Additionally, inconsistencies between pretest and posttest items with the delivered content suggest a failure in applying the principle of constructive alignment, which requires learning objectives, instructional strategies, and assessments to be in harmony (Loughlin et al., 2021). From an andragogical standpoint, adult learners expect learning to be practical, contextual, and reflective of real-world experiences, a principle that must be reinforced through flexible and participatory training approaches (Bahrani, 2024; Kirdan & Kirdan, 2019; Tessier et al., 2021).

Beyond instructional design, the quality of learning facilities whether physical or digital emerged as a critical determinant of participant satisfaction. The online format, although beneficial in terms of accessibility, was rated lower due to challenges related to infrastructure readiness, unstable connections, and limited media interactivity. These findings support prior evidence suggesting that technological limitations can hinder engagement and learning outcomes in online training (Akram et al., 2022). Offline training, while rated higher overall, still revealed location-specific inconsistencies in the cleanliness, comfort, and technical completeness of facilities.

Such variation suggests a lack of standardized facility quality across different training locations and contradicts the principles of Total Quality Management (TQM), which emphasize continuous and consistent improvement at every level of implementation (Khasanah et al., 2023). From a broader perspective, these inconsistencies may lead to inequitable learning experiences, undermining the ideal that all participants, regardless of location, deserve equal access to conducive learning environments (Brink et al., 2021). This raises the need for more rigorous quality assurance mechanisms that ensure uniform standards across both online and offline modalities.

Participant perceptions regarding services such as registration, communication, and responsiveness also played a major role in shaping the overall training experience. The service component in online training revealed shortcomings, particularly in responsiveness and clarity of information. These issues reflect

deficiencies in the reliability and responsiveness dimensions outlined in the SERVQUAL model (Fuchs & Fangpong, 2021; Sibai et al., 2021). Inadequate digital communication infrastructure and slow administrative support in online settings contributed to lower satisfaction scores, as previously highlighted by Rajabalee & Santally (2021).

Conversely, offline training showed higher service ratings, likely due to the immediacy of in-person communication which allows for faster problem resolution. However, disparities in service quality across different training events call for standardization and a move toward digitization of services. Implementing responsive SOPs and integrated digital platforms would not only enhance efficiency but also ensure that all participants receive a consistent and professional service experience. The digitization of training services, as emphasized by Nazarova et al. (2021), is vital for streamlining administrative processes and building transparent, responsive communication systems.

Drawing from these insights, it becomes clear that efforts to improve training quality must adopt a holistic approach. Enhancements in instructional content will have limited impact if not supported by adequate facilities and professional service delivery. This interdependence echoes the systems thinking perspective proposed in the Instructional Systems Design (ISD) model, which views training as an integrated ecosystem where each component educational, technological, and administrative must align to achieve optimal outcomes (Gibbons & Mcdonald, 2023). Addressing one element in isolation is insufficient; a coordinated strategy is essential.

Furthermore, Total Quality Management principles emphasize that training excellence results from the synergy of all system elements (Khasanah et al., 2023). Continuous improvement must extend beyond the classroom to include learning infrastructure, service systems, and participant support. This aligns with the ecosystem-based learning design approach (Railean, 2022), which is particularly relevant in digital and hybrid contexts where learning effectiveness depends on the seamless interaction of technology, pedagogy, and support services. A holistic strategy that strengthens all these dimensions simultaneously is not only preferable, but indispensable for the sustainability of quality training initiatives.

2.1 Implications

This research offers several implications for both academic and practical domains. Theoretically, the research supports the application of instructional system design (ISD), Media Richness Theory, and Total Quality Management (TQM) in the context of public training institutions. It affirms that holistic, ecosystem-based training approaches are essential to enhance learning experiences and outcomes. Practically, the findings suggest that professional training centers such as PPSDM Migas need to adopt blended instructional strategies, improve digital infrastructure, and streamline administrative services to meet participant expectations in both offline and online modalities. From a policy standpoint, this research encourages policymakers to invest in continuous capacity building for facilitators, upgrade training facilities, and standardize service protocols across regions. It also highlights the necessity of integrating feedback mechanisms into quality assurance systems to ensure consistent improvement. For future research, the strategies proposed in this research could be tested using longitudinal methods or applied to other sectors to assess their generalizability and long-term effectiveness.

2.2 Research contribution

This research contributes to the growing body of literature on professional training evaluation by proposing an integrated evaluation framework that combines descriptive statistics, gap analysis, SWOT mapping, and PDCA cycles. Unlike conventional evaluation models, this research offers a holistic strategy formulation that not only identifies gaps but also directly translates them into actionable improvement plans. The research also reinforces the relevance of theories such as Total Quality Management (TQM), Media Richness Theory, and Instructional Systems Design (ISD) in the context of training for the energy industry. Practically, this research provides a replicable model for evaluating and improving training programs in public sector institutions. The instruments, analytical techniques, and resulting strategies can be adopted by other technical training providers to enhance training delivery, participant satisfaction, and institutional performance.

2.3 Limitations

While this research offers valuable insights and practical strategies for enhancing training quality at PPSDM Migas, several limitations must be acknowledged. First, the evaluation relies solely on participants' perceptions, without incorporating perspectives from instructors or institutional administrators, which may limit the comprehensiveness of the analysis. Second, although the sample size was substantial (1,539

respondents), the findings may not be generalizable to training institutions beyond the oil and gas sector or those operating in different cultural and organizational contexts. Third, the research employed a cross-sectional design, which does not allow for the observation of long-term changes in training effectiveness or participant competence. Finally, while the survey instruments were validated through expert judgment and preliminary pilot testing, further psychometric analysis such as confirmatory factor analysis is recommended to enhance their robustness and applicability in future research.

2.4 Suggestions

Building upon the findings and limitations of this research, several suggestions can be proposed for future research and practical implementation. First, upcoming evaluations of training quality should adopt a multi-stakeholder perspective, integrating input not only from participants but also from facilitators, program designers, and administrative staff. This inclusive approach would provide a more holistic view of the training process and allow for triangulation of data. Second, future studies could implement longitudinal designs to measure the impact of training on actual work performance and retention of knowledge over time, thus offering stronger evidence of training effectiveness. Third, it is recommended that training institutions incorporate technology-enhanced evaluation systems that utilize learning analytics and real-time feedback to continuously improve their programs in a data-driven manner. Lastly, cross-sectoral comparative studies involving institutions from various industries may uncover contextual factors and best practices that can inform more adaptive and scalable training models across domains.

D. Conclusion

This research offers a strategic framework for enhancing the quality of training at PPSDM Migas by integrating comprehensive evaluation tools with continuous improvement methodologies. Rather than merely reporting satisfaction scores, the analysis emphasizes actionable insights derived from a combination of gap analysis, SWOT mapping, and PDCA cycles, forming a dynamic basis for sustainable quality enhancement. The findings imply that institutional agility and responsiveness are critical in aligning training with the evolving needs of the oil and gas industry particularly under pressures of digitalization and global competition. From a theoretical standpoint, this research contributes to the discourse on evaluation-based quality development by demonstrating the value of multi-layered analytical instruments in transforming feedback into strategic action. Future research should explore the longitudinal impact of implemented strategies, particularly in measuring changes in participant competencies, organizational performance, and knowledge transfer. It is also recommended to investigate the integration of AI-supported feedback systems, gamification elements, and adaptive learning platforms to further personalize and optimize training outcomes in technical and vocational education contexts.

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F. Author Contribution Statement

YH conceived the research idea and led the research design. ME conducted the data analysis and participated in interpreting the results. YH and ME collaboratively developed the training evaluation instrument and formulated strategic recommendations. YH wrote the initial draft of the manuscript. ME contributed to the revision and finalization of the manuscript. Both authors reviewed and approved the final version for submission.

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