

# A Training of Harnessing Generative AI in Designing a Deep Learning-Based English Lesson Plan for EFL Vocational Teachers

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## Abstrak

Kemajuan pesat kecerdasan buatan generatif (*generative artificial intelligence*, Gen-AI) membuka peluang baru bagi pengajaran bahasa Inggris, terutama dalam merancang rencana pembelajaran berbasis pendekatan pembelajaran mendalam (*deep learning*). Namun, banyak guru EFL belum memperoleh pelatihan yang memadai untuk memanfaatkan teknologi ini secara efektif. Penelitian ini mengkaji persepsi guru EFL sekolah menengah kejuruan terhadap pelatihan Gen-AI dan tantangan yang mereka hadapi. Partisipan berjumlah 52 guru EFL dari sekolah negeri dan swasta yang mengikuti program pengabdian kepada masyarakat. Data dikumpulkan melalui kuesioner, termasuk butir pertanyaan terbuka, dan dianalisis menggunakan statistik deskriptif. Hasil penelitian menunjukkan persepsi yang positif terhadap pelatihan. Sebagian besar guru setuju bahwa Gen-AI relevan bagi pengembangan profesional, mendukung kreativitas dalam penyusunan rencana pembelajaran, dan mempercepat penyiapan materi berbasis pembelajaran mendalam. Guru juga melaporkan kepercayaan diri dalam menggunakan Gen-AI secara bertanggung jawab serta motivasi yang kuat untuk terus menerapkannya di kelas. Meski demikian, tantangan tetap ada pada literasi digital, keahlian teknis, dan penyesuaian keluaran Gen-AI dengan konteks kelas. Temuan ini menunjukkan perlunya pengembangan profesional berkelanjutan, dukungan institusional, dan penelitian lanjutan mengenai dampak jangka panjang Gen-AI.

**Kata Kunci:** Pembelajaran Mendalam; Pengajaran Bahasa Inggris; Gen-AI; Pelatihan Guru; Pengembangan Profesional.

## Abstract

The rapid advancement of generative artificial intelligence (Gen-AI) has opened new opportunities for English language teaching, particularly in designing lesson plans grounded in deep learning approaches. However, many EFL teachers still lack adequate training to use these tools effectively. This study investigated vocational high school EFL teachers' perceptions of Gen-AI training and the challenges they encountered. The participants were 52 EFL teachers from public and private schools who took part in a community service program. Data were collected through a questionnaire, including open-ended items, and analysed using descriptive statistics. The results showed positive perceptions of the training. Most teachers agreed that Gen-AI is relevant to their professional development, supports creativity in lesson planning, and speeds up the preparation of deep learning-based materials. They also reported confidence in using Gen-AI responsibly and strong motivation to continue applying it in their classrooms. Nevertheless, challenges remained in digital literacy, technical expertise, and the adaptation of Gen-AI outputs to classroom contexts. These findings point to the need for sustained professional development, institutional support, and further research on the long-term impact of Gen-AI.

**Keyword:** Deep Learning; English Language Teaching; Gen-AI; Teacher Training; Professional Development.

## 1. Introduction

English language learning in vocational high schools in Indonesia plays a strategic role in preparing competent graduates for the demands of the global workforce. The current curriculum encourages mastery of English not only for everyday communication but also for specific purposes, in line with students' areas of expertise (Akbar & Sulisty, 2018). In practice, however, English instruction in vocational high schools often focuses on superficial mastery of material rather than in-depth learning that develops critical, creative, collaborative, and communicative thinking skills (Novia *et al.*, 2024). Such a condition can result in low student engagement, limited relevance of learning to the workplace, and reduced graduate competitiveness in a globalized labour market [tambahkan referensi].

EFL teachers in vocational high schools, who are responsible for implementing learning, face considerable challenges in improving the quality of teaching. Many teachers still rely on conventional approaches with limited learning resources and strategies that do not fully accommodate the principles of deep learning (Apoko, 2024; Basuki & Hidayati, 2020). Time constraints, heavy administrative burdens, and a lack of training in learning innovation further hinder them from designing creative, contextual lesson plans oriented toward 21st-century skills (Muliyah & Aminatun, 2020). Empowering teachers to use technology that supports more effective and meaningful lesson planning is therefore important.

A priority issue for vocational high school EFL teachers is the difficulty of developing lesson plans based on a deep learning approach that aligns with curriculum demands while also capturing student interest, encouraging active engagement, and fostering in-depth understanding. One cause is teachers' limited knowledge and skills in integrating artificial intelligence-based technology (Rodliyah, 2018), particularly generative artificial intelligence (Gen-AI), into lesson plan design. Even so, Gen-AI has the potential to help EFL teachers generate creative learning ideas, develop relevant teaching materials, and organize more interactive learning activities (Apoko, 2025). Previous studies have indicated that Gen-AI can enhance teacher creativity, accelerate the design of learning tools, and widen access to more varied and contextual learning resources (Jaculine Priya & Fathima Nancy Dyana, 2025; Tzirides, 2024), which may improve the quality of learning.

Training on the use of Gen-AI in designing deep learning-based lesson plans was therefore organized for vocational high school EFL teachers. The training equipped teachers to use Gen-AI at each stage of lesson planning, from formulating learning objectives and selecting materials to designing activities and evaluating learning in line with deep learning principles. The targeted outcomes were 1) improved teacher understanding and skills in using Gen-AI to develop innovative lesson plans, 2) examples of deep learning-based English lesson plans ready for classroom implementation, and 3) collaborative networks among teachers for sharing best practices in technology-based learning. Against this background, this study aimed to 1) explore vocational high school EFL teachers' perceptions of using Gen-AI to develop deep learning-based lesson plans and 2) identify the challenges they faced in designing such lesson plans with the help of Gen-AI.

## 2. Method

### 2.1. Context and Participants

The participants were 52 EFL teachers from vocational high schools in East Jakarta, Indonesia. As shown in Table 1, most were female (71.15%) and taught in private schools (69.23%). The largest age group was 36–45 years (40.38%), followed by those above 45 years (28.85%), 25–35 years (25.00%), and below 25 years (5.77%). Teaching responsibilities were distributed fairly evenly across grade 10 (36.54%), grade 11 (32.69%), and grade 12 (30.77%). In terms of teaching experience, 32.69% had less than 5 years, 25.00% had 5–10 years, 30.77% had 11–20 years, and 11.54% had more than 20 years. Regarding prior training, 42.31% had joined Gen-

AI-related training and 48.08% had joined training on deep learning, while the remaining participants (57.69% and 51.92%, respectively) had not.

Table 1. Participant Demographics

| Category                        | Subcategory | n  | %     |
|---------------------------------|-------------|----|-------|
| Gender                          | Male        | 15 | 28.85 |
|                                 | Female      | 37 | 71.15 |
| Age                             | < 25 years  | 3  | 5.77  |
|                                 | 25–35 years | 13 | 25.00 |
|                                 | 36–45 years | 21 | 40.38 |
|                                 | > 45 years  | 15 | 28.85 |
| School type                     | Public      | 16 | 30.77 |
|                                 | Private     | 36 | 69.23 |
| Teaching grade                  | 10          | 19 | 36.54 |
|                                 | 11          | 17 | 32.69 |
|                                 | 12          | 16 | 30.77 |
| Teaching experience             | < 5 years   | 17 | 32.69 |
|                                 | 5–10 years  | 13 | 25.00 |
|                                 | 11–20 years | 16 | 30.77 |
|                                 | > 20 years  | 6  | 11.54 |
| Previous Gen-AI training        | Yes         | 22 | 42.31 |
|                                 | No          | 30 | 57.69 |
| Previous deep learning training | Yes         | 25 | 48.08 |
|                                 | No          | 27 | 51.92 |

## 2.2. Activity Format and Stages

The training was conducted over four days in a blended format (6–9 August 2025), with one day held offline in a large hall at SMK 24 East Jakarta and three days conducted asynchronously via a WhatsApp group. The activity was implemented through three stages, summarized in Figure 1:

- 1) Preparation, which included (a) coordination with the host school and the English Subject Teachers' Community (MGMP) for vocational high schools, (b) preparation of training materials covering deep learning concepts, lesson plan development guidelines, and techniques for using Gen-AI, and (c) preparation of technological equipment (laptops, a projector, and an internet connection).
- 2) Training implementation, which comprised four sessions:
  - a) Session 1: Introduction to deep learning, covering the concepts and principles of deep learning in vocational high school English learning and examples of its application in vocational classes.
  - b) Session 2: Preparation of deep learning-based lesson plans, covering the structure and components of lesson plans aligned with the Merdeka Curriculum and the deep learning approach, as well as student needs analysis and the determination of learning objectives.
  - c) Session 3: Use of Gen-AI for lesson planning, covering an introduction to Gen-AI platforms and applications (ChatGPT, Gemini, DeepSeek, Copilot, and MagicSchool; see Figures 4–7), strategies for using Gen-AI to generate lesson plan ideas, and hands-on practice in creating lesson plan components with Gen-AI.
  - d) Session 4: A lesson plan development workshop in which participants developed deep learning-based lesson plans with the help of Gen-AI, presented their results, and received feedback from the facilitator.
- 3) Training mentoring, which included (a) three days of online mentoring to support the completion of the lesson plans and (b) review, reflective discussions, and the sharing of best practices through a communication group on WhatsApp.

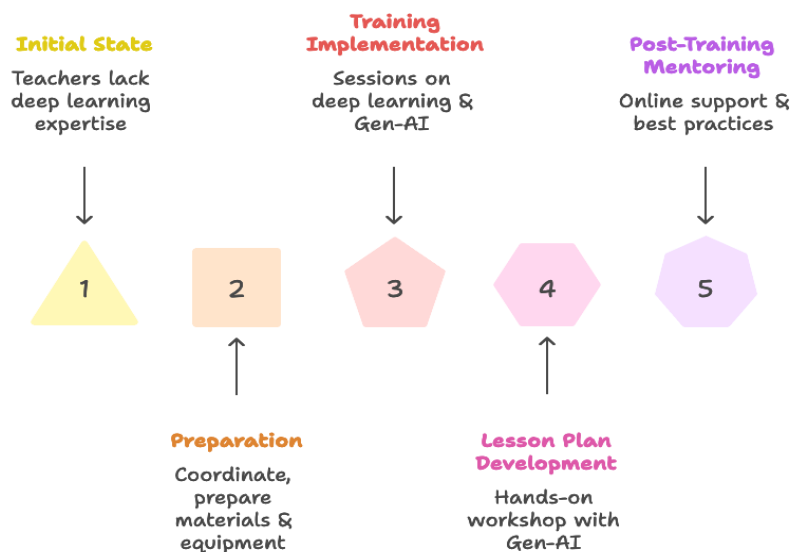


Figure 1. Stages of the Training Activity

The training used interactive lectures to deliver concepts, group discussions to share experiences and challenges, demonstrations of Gen-AI use in lesson planning, hands-on practice with facilitator assistance, and collaborative feedback to improve the lesson plans produced by participants. Figure 2 shows the interactive presentation by the resource person, and Figure 3 shows a group discussion.



Figure 2. Interactive Presentation by the Resource Person



Figure 3. Group Discussion

### 2.3. Data Collection and Analysis

Data were collected using a structured questionnaire that comprised demographic items (e.g., gender, age, teaching experience, and school type), Likert-scale items measuring teachers' perceptions of using Gen-AI to develop deep learning-based lesson plans, and open-ended questions exploring perceived benefits and challenges. Quantitative data were analysed descriptively using frequencies, percentages, means, and standard deviations. Qualitative data were analysed thematically following the interactive model of Miles *et al.* (2014), which consists of data condensation, data display, and conclusion drawing. Combining the two data types follows the mixed-methods framework of Creswell and Plano Clark (2018) and was intended to provide both breadth and depth in understanding teachers' readiness, experiences, and training needs.

### 3. Results and Discussion

#### 3.1. Results

##### 3.1.1. Perceptions of Vocational High School EFL Teachers on the Use of Gen-AI in Developing Deep Learning-Based Lesson Plans

The questionnaire results indicated highly positive responses regarding the relevance of Gen-AI training for professional development. Almost all participants agreed or strongly agreed that the training was highly relevant ( $M = 4.65$ ,  $SD = 0.52$ ) and motivating ( $M = 4.54$ ,  $SD = 0.58$ ), as shown in Table 2. These findings suggest that vocational EFL teachers recognize the potential of Gen-AI to support their pedagogical practices and are eager to adopt new technologies in their classrooms. Participants also perceived the training materials as understandable and applicable ( $M = 4.40$ ,  $SD = 0.66$ ) and reported a clear understanding of how Gen-AI tools such as ChatGPT, Gemini, DeepSeek, and Copilot work ( $M = 4.40$ ,  $SD = 0.57$ ). The training was valued for helping teachers design more creative and effective lesson plans ( $M = 4.50$ ,  $SD = 0.61$ ). Teachers reported confidence in using Gen-AI to design English learning activities ( $M = 4.37$ ,  $SD = 0.63$ ) and agreed that it speeds up the lesson planning process ( $M = 4.48$ ,  $SD = 0.58$ ). The examples provided during the training were considered helpful ( $M = 4.40$ ,  $SD = 0.63$ ), and the resource person was perceived as effective in explaining the integration of Gen-AI into deep learning-based lesson planning ( $M = 4.37$ ,  $SD = 0.63$ ).

In addition, the training was seen as broadening teachers' perspectives on 21st-century technology and pedagogy ( $M = 4.48$ ,  $SD = 0.58$ ). Participants expressed strong interest in further training on AI for English teaching ( $M = 4.40$ ,  $SD = 0.63$ ) and reported awareness of the ethical and responsible use of Gen-AI in education ( $M = 4.33$ ,  $SD = 0.55$ ). They also believed that Gen-AI could improve the quality of English learning in their classes ( $M = 4.40$ ,  $SD = 0.57$ ) and were willing to recommend the training to colleagues ( $M = 4.37$ ,  $SD = 0.60$ ).

Table 2. EFL Teachers' Views on the Use of Gen-AI in Developing Lesson Plans

| No | Statement                                                                                                            | SD<br>(%) | D<br>(%) | N<br>(%) | A<br>(%) | SA<br>(%) | M    | SD   |
|----|----------------------------------------------------------------------------------------------------------------------|-----------|----------|----------|----------|-----------|------|------|
| 1  | Training on Gen-AI is highly relevant for the professional development of English teachers.                          | 0         | 0        | 1.92     | 30.77    | 67.31     | 4.65 | 0.52 |
| 2  | I felt motivated to take part in the training that discussed the use of Gen-AI in teaching.                          | 0         | 0        | 3.85     | 38.46    | 57.69     | 4.54 | 0.58 |
| 3  | Generative AI training materials are easy to understand and applicable for English teachers.                         | 0         | 1.92     | 3.85     | 46.15    | 48.08     | 4.40 | 0.66 |
| 4  | I was able to understand how Gen-AI tools like ChatGPT, Gemini, DeepSeek, or Copilot work after taking the training. | 0         | 0        | 3.85     | 51.92    | 44.23     | 4.40 | 0.57 |
| 5  | The training helped me to create more creative and effective lesson plans.                                           | 0         | 0        | 5.77     | 38.46    | 55.77     | 4.50 | 0.61 |
| 6  | I feel confident using Gen-AI to design English learning activities.                                                 | 0         | 0        | 7.69     | 48.08    | 44.23     | 4.37 | 0.63 |
| 7  | Gen-AI can speed up the process of preparing deep learning-based lesson plans.                                       | 0         | 0        | 3.85     | 44.23    | 51.92     | 4.48 | 0.58 |
| 8  | I found the examples given during the Gen-AI training helpful.                                                       | 0         | 0        | 7.69     | 44.23    | 48.08     | 4.40 | 0.63 |

|    |                                                                                                                                               |   |   |      |       |       |      |      |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------|---|---|------|-------|-------|------|------|
| 9  | The training resource person was able to explain how to integrate Gen-AI in designing English lesson plans based on a deep learning approach. | 0 | 0 | 7.69 | 48.08 | 44.23 | 4.37 | 0.63 |
| 10 | I plan to use Gen-AI regularly in developing lesson plans with deep learning approaches after this training.                                  | 0 | 0 | 7.69 | 46.15 | 46.15 | 4.38 | 0.63 |
| 11 | This training opened my new insights about 21st-century technology and learning.                                                              | 0 | 0 | 3.85 | 44.23 | 51.92 | 4.48 | 0.58 |
| 12 | I feel there is a need for further training on the use of AI for English teaching.                                                            | 0 | 0 | 7.69 | 44.23 | 48.08 | 4.40 | 0.63 |
| 13 | I am able to distinguish the ethical and responsible use of AI in the learning process.                                                       | 0 | 0 | 3.85 | 59.62 | 36.54 | 4.33 | 0.55 |
| 14 | I believe that Gen-AI can improve the quality of English learning in my class.                                                                | 0 | 0 | 3.85 | 51.92 | 44.23 | 4.40 | 0.57 |
| 15 | I am willing to recommend this Gen-AI utilization training to other fellow teachers.                                                          | 0 | 0 | 5.77 | 51.92 | 42.31 | 4.37 | 0.60 |

Note. SD (%) = strongly disagree; D = disagree; N = neutral; A = agree; SA = strongly agree; M = mean; SD = standard deviation.

The *interview* findings reinforced the positive perceptions captured in the questionnaire. Several participants stated that the training enriched their pedagogical knowledge and contributed to improving their classroom practices. One teacher noted that the program not only enhanced their own teaching but also gave them insights to share with colleagues. Teachers also emphasized their intention to apply the knowledge immediately, which is consistent with the high mean scores for motivation and readiness to use Gen-AI in lesson planning.

Participants also described concrete benefits, including a deeper understanding of Gen-AI applications, more efficient lesson plan development, and greater creativity in designing mindful, meaningful, and joyful learning experiences. They expressed confidence in using Gen-AI to create more engaging, student-centred materials and noted that the training expanded their awareness of digital educational trends. These responses are in line with the questionnaire results on relevance and applicability. The following excerpts are from Participants 10, 21, 24, 34, and 40.

*"I gained new knowledge that allows me to improve the teaching and learning process in the classroom. I can also share my knowledge with my colleagues at my school. I will immediately apply everything I learned from today's training." (Participant 10)*

*"The benefits I experienced from this training include a greater understanding of the benefits of Gen AI, especially in the field of deep learning. I also learned more about the types of Gen AI applications that can help me be creative and achieve mindful, meaningful, and joyful learning." (Participant 21)*

*"The benefits I experienced from this training include helping me create lesson plans more quickly. I also learned more about the various types of AI that can be used for learning." (Participant 24)*

*"I became more confident in developing in-depth lesson plans and applying them to my weekly teaching and learning activities." (Participant 34)*

*"This training provided many benefits, especially in increasing my understanding of the use of Generative AI technology in education. I feel more confident leveraging AI to design more engaging, efficient, and student-focused learning modules. Furthermore, this training has broadened my understanding of current educational trends, which are increasingly digital and adaptive." (Participant 40)*

### 3.1.2. Challenges Encountered by EFL Teachers in Designing Deep Learning-Based Lesson Plans Using Gen-AI

The *interview* findings revealed several challenges in designing deep learning-based lesson plans with the support of Gen-AI. A recurring issue was limited technological competence: some participants admitted that their digital literacy and technical skills were not yet sufficient to optimize Gen-AI tools. They described difficulty in creating effective prompts, operating advanced features, and adapting AI-generated outputs to their classroom contexts, which suggests that many teachers still need further training and capacity building. Accessibility and ethical considerations were also raised. Some participants noted that using free Gen-AI accounts limited the features available for exploration, while others stressed that Gen-AI integration in lesson plans must remain accurate, ethical, and relevant to curriculum demands and student needs. Teachers also expressed caution about overreliance on Gen-AI, acknowledging its usefulness while worrying about depending too heavily on it. These insights suggest that adopting Gen-AI in EFL classrooms requires not only technical training but also guidance on ethical, responsible, and context-sensitive use. The following excerpts are from Participants 7, 18, 34, 40, and 42.

*"I feel my current technology skills are still lacking and need to be further improved." (Participant 7)*

*"My challenge is more related to the limited use of Gen AI because I use a free account, not a premium one. This limits the use and features of these applications, preventing me from exploring them to their full potential." (Participant 18)*

*"I must be more selective in choosing to use technological facilities such as Generative AI and develop lesson plans that are more accurate, ethical, and responsible." (Participant 34)*

*"The main challenge I face is my limited technical understanding of how to optimally use some Generative AI features. Furthermore, I must adapt the AI results to the local context, student needs, and the applicable curriculum to ensure the lesson plans I develop remain relevant and effective for the learning process." (Participant 40)*

*"The challenge I face is my limited digital literacy and lack of technical skills to operate AI optimally, such as creating appropriate prompts to achieve desired results. Improvements are also needed to adapt to the specific student context I encounter in my classroom. I have to admit, AI is very helpful, but I'm worried about becoming dependent on it." (Participant 42)*

The Gen-AI platforms introduced during the training are shown in Figures 4–7.

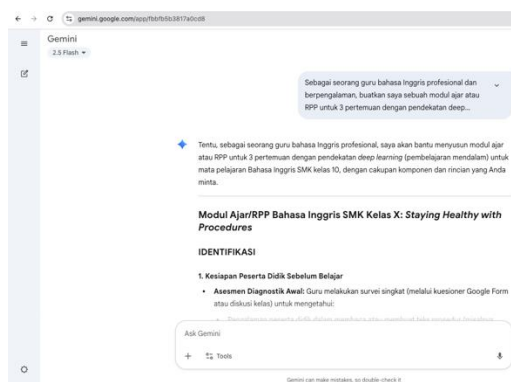


Figure 4. Gemini AI

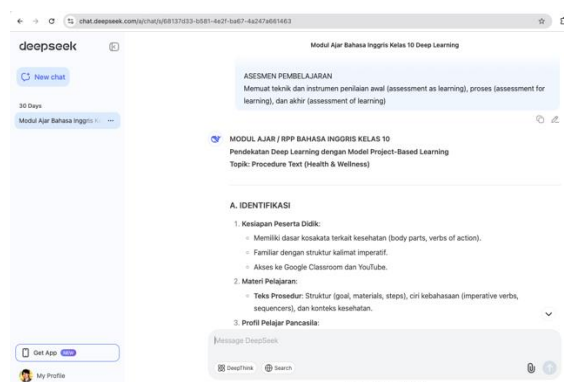


Figure 5. Deepseek AI

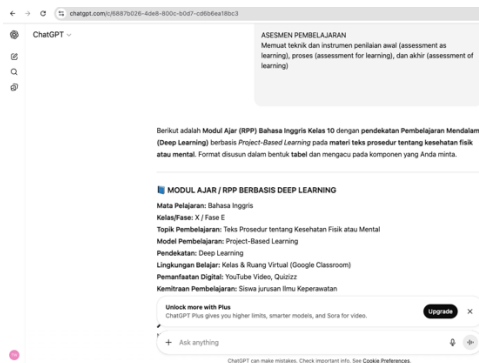


Figure 6. ChatGPT AI

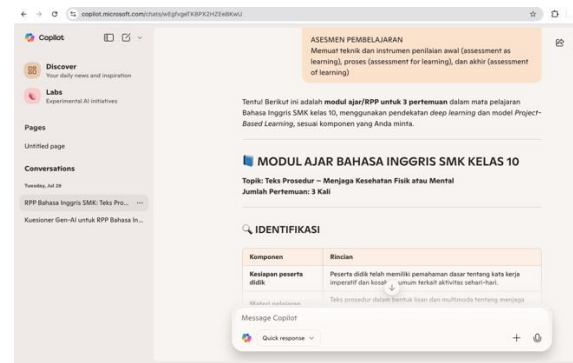


Figure 7. Copilot AI

### 3.2. Discussion

The findings show that vocational EFL teachers perceived Gen-AI as highly relevant to their professional development. The high mean scores for relevance and motivation indicate readiness to adopt technological innovations that can improve teaching quality, which aligns with research describing Gen-AI as a catalyst for pedagogical change in language education (Rajak *et al.*, 2024). Teachers' enthusiasm suggests growing recognition of Gen-AI as a component of 21st-century pedagogy, particularly in vocational contexts where practical skills and adaptability are crucial.

Participants valued the clarity and applicability of the materials and the practical examples demonstrated, which indicates that a well-designed professional development program can help narrow teachers' technological knowledge gaps and build confidence in applying Gen-AI to lesson design. This is consistent with a study showing that hands-on workshops combined with scaffolding and contextualized tasks improve teachers' technology acceptance and application in lesson planning (Koraishi, 2025). Participants' ability to understand how tools such as ChatGPT and Gemini function suggests that the training made the technology accessible to practitioners. Teachers also saw Gen-AI as a practical resource for increasing efficiency and creativity in lesson preparation. Their confidence that it speeds up planning echoes findings that Gen-AI can reduce administrative workload and allow more focus on student-centred pedagogies (Apoko *et al.*, 2025; Irdalisa *et al.*, 2025). Because the training focused on deep learning, Gen-AI was framed not only as a productivity tool but also as a means of supporting higher-order thinking skills (HOTS) and meaningful engagement, resonating with the findings of Lee and Eronen (2025) and Derakhshan and Taghizadeh (2025).

Participants' recognition of ethical and responsible Gen-AI use points to critical awareness fostered by the training. This is important given concerns about bias, misinformation, and overreliance on Gen-AI; professional development should therefore be continuous and iterative so that teachers can navigate both opportunities and challenges (Kovalenko & Baranivska, 2024). Their willingness to recommend the training to peers also signals a potential multiplier effect, in which communities of practice could help share and sustain Gen-AI literacy.

Despite their enthusiasm, teachers still faced substantial challenges in using Gen-AI effectively. The questionnaire indicated slightly lower confidence in integrating Gen-AI tools than perceived benefits, and the *interviews* helped explain this difference. Participants reported limited digital literacy, a lack of technical expertise, and the need to adapt Gen-AI outputs to specific curricula and classroom contexts. These concerns resonate with prior studies reporting that teachers often struggle with Gen-AI tools when planning lessons and preparing other learning materials (Muliyah & Aminatun, 2020; Zhu & Yang, 2025) and that they require targeted professional development to build confidence and competence (Septiani *et al.*, 2025).

## 4. Conclusion

This study found that the Gen-AI training was associated with positive perceptions, motivation, and confidence among vocational school EFL teachers in integrating technology into lesson planning. The teachers regarded Gen-AI as a relevant and timely tool and as a practical means of designing more creative and effective deep learning-oriented lesson plans. They also reported a better understanding of Gen-AI applications, greater awareness of ethical considerations, and a forward-looking view of 21st-century teaching. These results suggest that structured professional development can help EFL teachers use Gen-AI to strengthen instructional design and the quality of English learning in vocational high schools.

Several limitations should be noted. The study relied mainly on self-reported data from questionnaires and open-ended responses, which reflect participants' subjective perceptions rather than observed classroom practice. The participants were a relatively small group of teachers from public and private vocational high schools in East Jakarta, which may limit the generalizability of the results to other educational settings. The short duration of the training also did not allow long-term evaluation of how teachers sustained Gen-AI use in their teaching. Future studies could therefore incorporate classroom observations, larger and more diverse participant groups, and longitudinal designs to capture the lasting impact of AI-based professional development.

The findings have implications for practice and research. Teacher training institutions should integrate Gen-AI into regular capacity-building programs so that teachers develop both technical and pedagogical competencies, and schools should provide adequate infrastructure and ongoing mentoring to support sustained use of Gen-AI in lesson planning. Further research is needed on how Gen-AI affects student engagement and learning outcomes in deep learning-based English classrooms. Fostering teachers' critical digital literacy also remains important so that they can benefit from Gen-AI while using it ethically, responsibly, and appropriately for their context.

## 5. Acknowledgments

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