What Do Indonesian Teachers Really Need from Language Technology? A Nationwide K–12 Survey

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Abstract

Despite emerging use in Indonesian classrooms, there is limited large-scale, teacher-centred evidence on how language technology is used in practice and what support teachers need, hindering the development of context-appropriate language technology systems and policies. To address this gap, we conduct a nationwide survey of 349 K–12 teachers across elementary, junior high, and senior high schools. We find increasing use of language technology for pedagogy, content development, and teaching media, although adoption remains uneven. Elementary teachers report more consistent use, while senior high teachers engage less; mid-career teachers assign higher importance to language technology, and teachers in Eastern Indonesia perceive greater value. Across levels, teachers primarily use language technology to reduce instructional preparation workload (e.g., assessment, lesson planning, and material development). However, generic outputs, infrastructure constraints, and limited contextual alignment continue to hinder effective classroom integration.

1 Introduction

Indonesia's education system serves more than 52 million students but relies on only around three million teachers,[1] making scalable approaches to improving learning outcomes essential. Language technology (LT) offers one such path and is increasingly being introduced into Indonesian classrooms. However, large-scale, teacher-centred evidence on how LT is adopted in practice and what kinds of support teachers require remains limited. This gap hampers the development of LT systems that align with classroom realities, particularly in a context marked by uneven digital infrastructure, varying technological readiness, and linguistic diversity (Kusharjanto and Kim, 2011; Rahmi et al., 2025; Harsanti et al., 2025; UNESCO and UNESCO Office in Jakarta, 2024).

To address this gap, we conduct a nationwide survey of Indonesian K–12 teachers examining their adoption of LT across six key domains of instructional practice: content knowledge development, pedagogy (Kleickmann et al., 2013), assessment and evaluation (Aisyah et al., 2026), curriculum development (Alsubaie, 2016), teaching media, and professional practice. Beyond documenting usage patterns, we investigate teachers' perceived needs for LT-based support and the challenges they face when integrating LT into their work. Following the taxonomy of Al Kautsar et al. (2025), we categorize LT tools into six groups: LLM-based text assistants, machine translation systems, image generation tools, video generation tools, grammatical correction tools, and speech technologies (text-to-speech and speech-to-text).

Our survey yields four key findings. (i) LT is mainly used for content knowledge and teaching materials, while curriculum development remains limited. (ii) Adoption varies across groups: elementary teachers and those in Eastern Indonesia report higher use, whereas senior high teachers and more experienced teachers engage less. (iii) Teachers' main needs center on instructional preparation, especially assessment items, lesson plans, and teaching materials. (iv) Key barriers include generic outputs, infrastructure limitations, and weak curricular alignment rather than lack of teacher interest.

2 Related Work

Prior work by Diliberti et al. (2024) examined LT use in teaching within U.S. schools but remained limited in its coverage of usage frequency across educational levels. Our work differs in both focus and depth. We study LT adoption in Indonesia, a developing-country context, and examine how LT is used across specific components of teaching

[1] https://www.statista.com/topics/9229/education-in-indonesia

practice, as well as the concrete challenges teachers face and the support they need in everyday classroom settings.

Prior work on LT in the Indonesian context remains limited in scope for understanding classroom use. At the broadest level, Al Kautsar et al. (2025) surveys Indonesians nationwide on their general use of and needs from LT, but does not target teachers or examine educational settings. Studies focused on education are narrower in coverage: Widianingsih (2025) examines changes in teachers' roles and training needs following LT adoption, while Putra and Saputra (2025) focuses on LT use in *Bahasa Indonesia* instruction based on interviews with only twelve teachers. Other studies emphasize systemic issues, such as infrastructure, policy, privacy, and multilingualism, rather than everyday classroom practice (Maspul et al., 2025; Fauziddin et al., 2025). In contrast, our work draws on a nationwide survey to examine how Indonesian teachers use LT across core teaching components and a broad range of teacher characteristics, including age, subject area, and education level, while identifying concrete challenges and support needs.

3 Questionnaire and Data Processing

Questionnaire The questionnaire was developed in *Bahasa Indonesia* by a multidisciplinary team consisting of two education experts (PhD and MSc) and one AI researcher (PhD). It comprises four sections: (1) teacher demographics, (2) AI literacy, (3) use of language technologies (LT) in professional work, and (4) teachers' observations of students' LLM use. We examine LT use across six teaching-related areas: content knowledge development, pedagogy, assessment and evaluation, curriculum development, teaching media, and professional practice. The survey covers five LT categories: LLM-based assistants, machine translation, generative image and video tools, grammar checkers, and speech technologies. The full questionnaire and response distributions are provided in Appendix A.

The questionnaire was distributed via Google Forms through the authors' professional networks and broader educator communities. Pilot testing indicated a completion time of under 20 minutes. To encourage participation, five respondents were randomly selected to share a total prize of 5,000,000 IDR.

Respondents Over one month in December 2025, we collected 358 responses, of which 349 passed quality control checks using control questions. Our respondents span all five major island groups of Indonesia: Sumatra (69 respondents), Kalimantan (13), Java-Bali-Nusa Tenggara (255), Sulawesi (20), and Maluku-Papua (1), and represent a broad mix of schooling levels, locations, and experience. By school level, junior high teachers form the largest group (41.3%), followed by elementary (38.0%) and senior high/vocational teachers (26.3%).[2] Schools are distributed across urban (44.1%), suburban (25.4%), and rural (30.4%) areas. In terms of experience, the largest group has more than 15 years of teaching experience (36.3%). Most respondents hold a Bachelor's degree as their highest qualification (80.4%), and 67.3% have completed a teacher professional education program (*Pendidikan Profesi Guru*).

4 Result and Analysis

Main Result Figure 1 shows the frequency of use and satisfaction with LT tools across components of effective teaching and learning, disaggregated by school level. Across all levels, teachers most frequently use LT for content knowledge development and teaching media preparation, with over 64% reporting frequent use, reflecting LT's value for acquiring, verifying, and presenting subject matter, as well as supporting repetitive and time-consuming tasks (Piyakun and Salim, 2023). In contrast, curriculum development is the least frequent use case, as it is not a daily activity. Usage patterns are largely consistent across educational levels. Teachers also report generally positive satisfaction with LT, with 66% indicating satisfaction across components. Teaching media is perceived as the most supported area, while professional practice is the least supported, consistent with its lower usage. Dissatisfaction remains low at around 3%, while moderate satisfaction is reported by approximately 28%, indicating room for further improvement.[3]

Detailed Results by Teacher Category We further analyze LT usage across teaching components by teacher characteristics (Table 1): subject area (science, social sciences, languages, general sub-

[2] Percentages exceed 100% as some teachers teach across multiple levels.

[3] A Wilcoxon signed rank test shows statistically significant differences between frequency and satisfaction across all components except content knowledge development ($p < 0.05$).

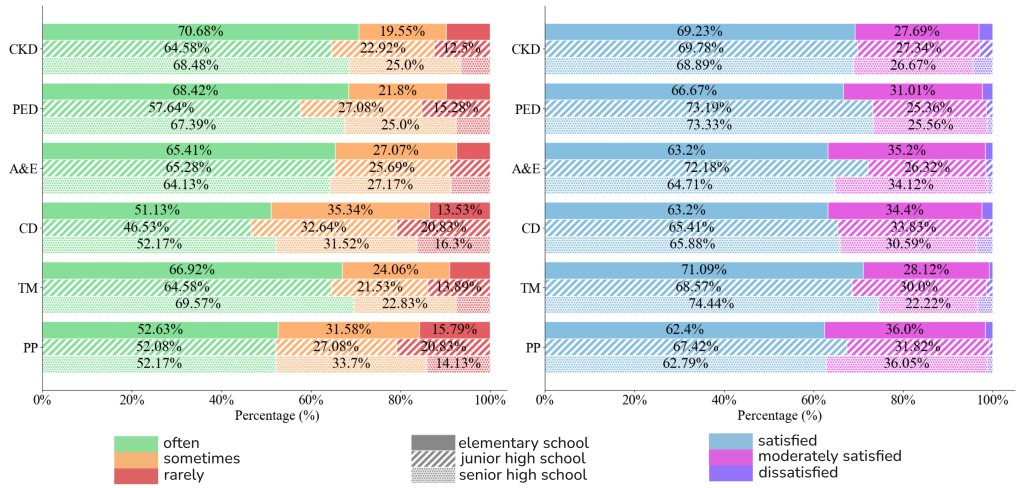

Figure 1: Frequency (left) and satisfaction (right) levels of LT tool usage in Indonesian education across components of effective teaching and learning. We divide the distribution by teachers' school levels (elementary, junior high, and senior high). CKD = Content Knowledge Development; PED = Pedagogy; A&E = Assessment and Evaluation; CD = Curriculum Development; TM = Teaching Media; PP = Professional Practice.

jects, arts and sports, and others including religious education), school level (elementary, junior high, senior high), teaching experience (0–5, 6–10, 11–15, and >15 years), school type (public/private), highest educational attainment (undergraduate/graduate), region (western/eastern Indonesia), and school setting (urban, suburban, rural). We report *percentage deviations* from each component's overall *frequency score*, computed by assigning 2 to 'often' and 'very often', 1 to 'sometimes', and 0 to 'rarely' and 'very rarely', then dividing by the maximum possible score ($2N$, where N is the number of respondents).

Table 1 reveals clear patterns. Arts, sports, and other-subject teachers show the most frequent LT use across all components, while language teachers report the lowest, followed by science, social science, and general subject teachers. Elementary teachers use LT more than those at higher levels, and teachers with more than 15 years of experience report consistently lower usage (average decline of 4.63 points from the mean), possibly reflecting age-related differences. Geographically, Eastern Indonesia stands out with positive deviations across all components, exceeding the average by more than 10% for pedagogy, curriculum development, and professional practice, indicating strong demand for LT support even in lower-infrastructure settings, consistent with Al Kautsar et al. (2025).

Types of LT Tools Used by Teachers In Figure 2 we further analyze the types of LT tools teachers use across six categories: text-based large language models (LLMs), machine translation (MT), text-to-speech and speech-to-text (TTS/STT), grammar checkers (GC), image-generative AI, and video-generative AI. Across all components, text-based LLMs are by far the most widely used, particularly for content knowledge development (n=223), assessment and evaluation (n=212), and teaching media (n=216), where teachers rely on them for instructional content creation and knowledge acquisition. Machine translation is the second most common tool, with the highest use again for content knowledge development (n=153). Image-generative AI is used primarily for teaching media (n=117), and video-generative AI shows the same pattern (n=82, vs. 36–64 in other components), supporting the creation of visual and multimedia materials. Less common are TTS/STT and grammar checkers, with peak use of 74 and 70 respondents respectively, both for content knowledge development.

Percieved Areas of Needs for LT Support Table 2 shows teachers' perceived priorities for LT support across professional tasks. The most frequently selected needs are related to instructional preparation and assessment. Nearly three-quarters of respondents indicated the needs for LT to create assessment items (72.2%) followed by syllabus design and lesson plan (69.6%), interactive teaching media (69.1%), visual teaching materials (67.6%) and text-based instructional content (67.6%). Administrative and pedagogical support also emerged as the next priorities. Around half of the teachers (49.0%) selected generating teaching method ideas and assisting with administrative tasks (49.0%).

Categories	#	CKD	PED	A&E	CD	TM	PP
Full	349	**0.788**	**0.765**	**0.785**	**0.666**	**0.777**	**0.673**
Science	100	-1.65%	0.00%	-3.18%	-5.41%	1.03%	3.27%
Social Science	50	-3.55%	-4.58%	-0.64%	-3.90%	-2.19%	1.04%
Language	75	-1.90%	-2.35%	-4.08%	-6.91%	-4.76%	-0.89%
General Teacher	80	-4.06%	-0.39%	-2.04%	1.35%	-3.47%	-5.20%
Art and Sport	24	5.71%	6.14%	0.89%	0.15%	-3.47%	5.20%
Others	88	2.41%	1.05%	1.27%	7.51%	1.67%	3.86%
Elementary	133	2.16%	3.66%	0.51%	3.30%	1.54%	1.63%
Junior High	144	-3.55%	-6.93%	-0.51%	-5.71%	-3.09%	-2.53%
Senior High	192	2.79%	4.44%	-1.02%	1.95%	4.25%	2.53%
0-5 Years Experience	75	-4.44%	-4.97%	0.25%	-5.86%	-2.19%	-10.85%
6-10 Years Experience	89	9.14%	4.31%	8.03%	6.31%	7.72%	1.78%
11-15 Years Experience	61	10.28%	8.24%	-3.95%	8.26%	4.38%	9.66%
>15 Years Experience	124	-8.88%	-4.05%	-3.95%	-4.95%	-6.56%	0.59%
Public School	220	1.27%	1.31%	-0.13%	0.30%	0.64%	1.04%
Private School	135	-1.78%	-1.70%	0.51%	0.60%	-0.39%	-0.45%
Undergraduate	283	0.51%	1.57%	0.89%	1.35%	0.90%	-0.30%
Graduate	58	-3.68%	-9.80%	-5.61%	-5.56%	-4.63%	1.19%
West Indonesia	317	-0.89%	-1.44%	-0.51%	-1.05%	-0.39%	-1.34%
East Indonesia	32	9.01%	14.38%	5.48%	10.21%	2.57%	13.82%
Urban	154	-3.55%	0.52%	-1.53%	1.35%	-4.25%	0.89%
Suburban	89	4.82%	2.09%	0.89%	2.10%	6.31%	-2.38%
Village	106	1.14%	-2.61%	1.53%	-3.60%	0.77%	0.89%

Table 1: Percentage differences across categories relative to the average importance score for each component of effective teaching and learning. CKD = Content Knowledge Development; PED = Pedagogy; A&E = Assessment and Evaluation; CD = Curriculum Development; TM = Teaching Media; PP = Professional Practice.

Item	Urb.	Sub.	Vil.
Top-10 Teachers' Needs from LT			
Creating exams & practice questions (A&E)	72.7	64.0	**78.3**
Designing syllabi or lesson plans (PED)	72.1	60.7	**73.6**
Creating interactive learning media (TM)	68.8	**70.8**	67.9
Preparing teaching materials (PED)	62.3	70.8	**72.6**
Creating visual learning media (TM)	64.9	62.9	**75.5**
Supporting creative teaching strategies (PED)	48.7	48.3	**53.8**
Assisting classroom administration (PP)	**50.6**	46.1	49.1
Automated grading of student work (A&E)	37.7	34.8	**48.1**
Supporting classroom research (PED)	34.4	38.2	**42.5**
Providing feedback to students (A&E)	30.5	30.3	**38.7**
Top-10 Teachers' Challenges Using LT			
LT feedback too general	30.9	**43.3**	40.6
Limited access to technology	28.0	**45.8**	36.3
Over-reliance on LT	30.9	**43.3**	27.8
LT answers lack coherence	**38.3**	22.9	32.1
Issues with LT-generated images	28.0	30.6	**38.5**
Unclear content ownership	28.0	**38.2**	19.2
LT not adaptive to student levels	22.1	22.9	**23.5**
LT language too difficult	23.5	17.8	**25.7**
Incorrect or misleading content	**25.0**	17.8	19.2
Misalignment with local curriculum	**13.2**	10.2	8.6

Table 2: Top-10 teacher-reported needs from and challenges using language technology, disaggregated by school location (%). A&E: Assessment & Evaluation; PED: Pedagogy; TM: Teaching Media; PP: Pedagogical Practice. Urb. = Urban, Sub. = Suburban, Vil. = Village.

Assessment-related support beyond item generation such as checking student answers (40.1%) and supporting classroom action research (37.8%) was moderately needed.

Challenges Experienced When Using LT Teachers report several challenges when using LT in learning. The most common issue is overly generic feedback (37%), followed by limited access to technology and infrastructure (35.1%) and concerns about over reliance on LT (33.1%). Other notable challenges include unclear LT responses, problems with LT generated images (31.8%), and uncertainty around intellectual property (27.9%), while issues such as language clarity, factual inaccuracies, and curriculum misalignment are less prevalent. Overall, while teachers recognize the benefits of AI, they continue to face challenges related to reliability, contextual relevance, infrastructure, and governance.

5 Conclusion

This paper presents the first nationwide, teacher-centred survey of language technology (LT) adoption in Indonesian K–12 education, based on responses from 349 teachers across all five major island groups. We find that LT has entered routine instructional practice, most often for content knowledge development and teaching media, though adoption is uneven across school levels, regions, and career stages. Teachers' priority needs converge on reducing instructional preparation workload, particularly assessment items, lesson plans, and teaching materials, while the main barriers they report, namely generic outputs, infrastructure constraints, and weak curricular alignment, reflect a mismatch between general-purpose LT and classroom realities rather than a lack of interest.

Limitations

This study has several limitations. First, all measures of LT usage, needs, satisfaction, and challenges are self-reported and were not triangulated

with behavioural logs, classroom observations, or qualitative interviews, which may introduce recall and social desirability bias. Second, although our sample spans all five major island groups, the distribution is skewed toward Java, Bali, and Nusa Tenggara, so regional comparisons, particularly for Eastern Indonesia, should be interpreted with caution; that said, this skew partly reflects the underlying population distribution, as Java and Sumatra are also the most populous regions of Indonesia. Third, the study is cross-sectional and captures LT adoption at a single point in time within a rapidly evolving technological landscape, and longitudinal work is needed to track how usage patterns, needs, and challenges shift as tools and policies mature. Finally, our analysis focuses on teachers' perspectives and does not directly measure student learning outcomes or the quality of LT-generated instructional materials, both of which are important directions for future work.

Ethical Consideration

This study was conducted with careful attention to participant privacy and data protection. All responses were collected anonymously, and no personally identifiable information was retained in the analysis. Participation was voluntary, and respondents were informed of the purpose of the study before completing the questionnaire. Collected data were used solely for research purposes and stored securely.

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A Full Questionnaire

This section presents the full questionnaire in Indonesian with English translation. We use **black** for original items, *grey italics* for translations, blue for notes, and red for attention-check questions and validation.

Yth. Bapak/Ibu Guru, survei ini ditujukan khusus untuk guru yang berdomisili di Indonesia. Apabila Anda bukan guru, dimohon untuk tidak berpartisipasi. Durasi pengisian survei ini sekitar 15 menit, terdiri dari 39 butir pertanyaan pilihan ganda. **Disklaimer.** Partisipasi Anda bersifat sukarela. Anda dapat memilih untuk tidak menjawab sebagian atau seluruh pertanyaan tanpa konsekuensi apa pun. Jawaban akan dijaga kerahasiaannya dan hanya digunakan untuk keperluan penelitian. **Tujuan Survei.** Survei ini bertujuan untuk menggali kebutuhan dan manfaat AI yang ditemukan guru, baik dalam persiapan, implementasi, maupun evaluasi dalam proses pembelajaran, serta untuk membandingkan penggunaan AI dalam pembelajaran lintas jenjang, mata pelajaran, dan konteks. **Hadiah.** Sebagai bentuk apresiasi, Anda mendapatkan kesempatan untuk mendapat hadiah dengan total Rp5.000.000 untuk 5 orang pemenang yang beruntung. Mohon mencantumkan nomor WhatsApp yang bisa dihubungi jika Anda terpilih sebagai pemenang.

Dear Teachers, this survey is intended specifically for teachers residing in Indonesia. If you are not a teacher, please refrain from participating. The survey takes approximately 15 minutes to complete and consists of 39 multiple-choice questions. ***Disclaimer.*** *Your participation is voluntary. You may choose not to answer any or all questions without any consequences. Responses will be kept confidential and used solely for research purposes.* ***Survey Objectives.*** *This survey aims to explore the needs and benefits of AI as identified by teachers in the preparation, implementation, and evaluation of the learning process, and to compare AI use in learning across school levels, subjects, and contexts.* ***Prize.*** *As a token of appreciation, you have the chance to win prizes totaling IDR 5,000,000, awarded to 5 lucky winners. Please provide a WhatsApp number that can be contacted if you are selected as a winner.*

Profil Guru

Teacher Profile

1. Pilih bidang pelajaran yang Anda ajar! (boleh lebih dari satu)

1. Select the subject area(s) you teach! (multiple choice allowed)

- ☐ IPA 59 (16.5%)
  Science
- ☐ IPS 18 (5%)
  Social Studies
- ☐ Bahasa Indonesia 34 (9.5%)
  Indonesian Language
- ☐ Bahasa Inggris 39 (10.9%)
  English
- ☐ Bahasa Daerah 9 (2.5%)
  Regional Language
- ☐ Matematika 41 (11.5%)
  Mathematics
- ☐ PPKN 26 (7.3%)
  Civics (Pancasila and Citizenship Education)
- ☐ Kesenian 11 (3.1%)
  Arts
- ☐ Agama 31 (8.7%)
  Religious Education
- ☐ Biologi (SMA) 4 (1.1%)
  Biology (Senior High)
- ☐ Fisika (SMA) 16 (4.5%)
  Physics (Senior High)
- ☐ Kimia (SMA) 5 (1.4%)
  Chemistry (Senior High)
- ☐ Sosiologi (SMA) 1 (0.3%)
  Sociology (Senior High)
- ☐ Ekonomi (SMA) 6 (1.7%)
  Economics (Senior High)
- ☐ Geografi (SMA) 1 (0.3%)
  Geography (Senior High)
- ☐ Sejarah (SMA) 7 (2%)
  History (Senior High)
- ☐ Olah raga 16 (4.5%)
  Physical Education
- ☐ Guru Kelas 80 (22.3%)
  Classroom Teacher
- ☐ Lainnya 62 (17.3%)
  Others

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2. Sebutkan jenjang pendidikan yang Anda ajar! (boleh lebih dari satu)
2. Indicate the education level(s) you teach! (multiple choice allowed)

- ☐ TK 8 (2.2%)
  Kindergarten
- ☐ SD (Kelas 1–6) 136 (38%)
  Elementary School (Grades 1–6)
- ☐ SMP (Kelas 7–9) 148 (41.3%)
  Junior High School (Grades 7–9)
- ☐ SMA/SMK (Kelas 10–12) 94 (26.3%)
  Senior High / Vocational School (Grades 10–12)

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3. Berapa lama pengalaman Anda menjadi guru?
3. How many years of teaching experience do you have?

- ☐ 0–5 tahun 76 (21.2%)
  0–5 years
- ☐ 6–10 tahun 90 (25.1%)
  6–10 years
- ☐ 11–15 tahun 62 (17.3%)
  11–15 years
- ☐ 15 tahun ke atas 130 (36.3%)
  Over 15 years

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4. Pilih jenis sekolah tempat Anda mengajar saat ini! (boleh pilih lebih dari satu)
4. Select the type of school where you currently teach! (multiple choice allowed)

- ☐ Negeri 226 (63.1%)
  Public
- ☐ Swasta 138 (38.5%)
  Private

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5. Apa pendidikan formal terakhir Anda?
5. What is your highest level of formal education?

- ☐ SMA 1.7%
  Senior High School
- ☐ D1, D2, D3 0.6%
  Diploma (1–3 years)
- ☐ S1 80.4%
  Bachelor's Degree
- ☐ S2 17.3%
  Master's Degree
- ☐ S3 0%
  Doctoral Degree

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6. Apakah Anda sudah mengikuti Pendidikan Profesi Guru (PPG)?
6. Have you completed the Teacher Professional Education program (PPG)?

- ☐ Sudah 67.3%
  Yes, completed
- ☐ Belum 23.5%
  Not yet
- ☐ Sedang menempuh 9.2%
  Currently enrolled

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7. Di provinsi apa sekolah Anda berada?
7. In which province is your school located?

- ☐ Nanggroe Aceh Darussalam 19
- ☐ Sumatera Utara 2
- ☐ Sumatera Selatan 0
- ☐ Sumatera Barat 20
- ☐ Bengkulu 0
- ☐ Riau 10
- ☐ Kepulauan Riau 3
- ☐ Jambi 15
- ☐ Lampung 0
- ☐ Bangka Belitung 0
- ☐ Kalimantan Barat 1
- ☐ Kalimantan Timur 12
- ☐ Kalimantan Selatan 0
- ☐ Kalimantan Tengah 0
- ☐ Kalimantan Utara 0
- ☐ Banten 4
- ☐ DKI Jakarta 14
- ☐ Jawa Barat 172
- ☐ Jawa Tengah 20
- ☐ Daerah Istimewa Yogyakarta 0
- ☐ Jawa Timur 34
- ☐ Bali 2
- ☐ Nusa Tenggara Timur 6
- ☐ Nusa Tenggara Barat 3
- ☐ Gorontalo 0
- ☐ Sulawesi Barat 1

- ☐ Sulawesi Tengah 0
- ☐ Sulawesi Utara 0
- ☐ Sulawesi Tenggara 10
- ☐ Sulawesi Selatan 9
- ☐ Maluku Utara 0
- ☐ Maluku 0
- ☐ Papua Barat 0
- ☐ Papua 0
- ☐ Papua Tengah 0
- ☐ Papua Pegunungan 0
- ☐ Papua Selatan 1
- ☐ Papua Barat Daya 0

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8. Sebutkan lokasi sekolah Anda saat ini!
8. Where is your current school located?

- ☐ Perkotaan 44.1%
  Urban
- ☐ Pinggiran Kota 25.4%
  Suburban
- ☐ Pedesaan 30.4%
  Rural

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9. Berapa usia Anda?
9. What is your age?

- ☐ 0–20 tahun –
  0–20 years
- ☐ 21–30 tahun 24%
  21–30 years
- ☐ 31–40 tahun 37.7%
  31–40 years
- ☐ 41–50 tahun 21.5%
  41–50 years
- ☐ 51–60 tahun 16.2%
  51–60 years
- ☐ 60 tahun ke atas 0.3%
  Over 60 years

---

10. Berapa seratus ditambah seratus?
10. What is one hundred plus one hundred?

- ☐ Seratus 2.2%
  One hundred
- ☐ Dua ratus 97.8%
  Two hundred
- ☐ Tiga ratus 0%
  Three hundred
- ☐ Empat ratus 0%
  Four hundred

This is an attention-check question used for response validation. Respondents who did not select "Dua ratus" (200) were excluded from the analysis.

Pertanyaan terkait literasi teknologi dan AI di sekolah
Questions on technology and AI literacy in schools

11. Seberapa sering Anda menggunakan teknologi (misalnya laptop atau smartphone) dalam kegiatan belajar mengajar?
11. How often do you use technology (e.g., laptop or smartphone) in teaching and learning activities?

- ☐ Sangat sering 47.2%
  Very often
- ☐ Sering 35.8%
  Often
- ☐ Kadang-kadang 15.4%
  Sometimes
- ☐ Jarang 1.7%
  Rarely
- ☐ Tidak pernah 0%
  Never

---

12. Untuk keperluan apa saja Anda menggunakan teknologi dalam kegiatan belajar mengajar? (boleh pilih lebih dari satu)
12. For what purposes do you use technology in teaching and learning activities? (multiple choice allowed)

- ☐ Menyusun materi/slide pembelajaran 286 (79.9%)
  Preparing learning materials/slides
- ☐ Menyampaikan materi di kelas 281 (78.5%)
  Delivering materials in class
- ☐ Memberikan tugas atau kuis secara daring 209 (58.4%)
  Assigning tasks or quizzes online
- ☐ Mencari referensi atau bahan ajar tambahan 306 (85.5%)
  Searching for references or supplementary teaching materials
- ☐ Berkomunikasi dengan siswa (misalnya melalui WhatsApp/Google Classroom) 226

(63.1%)
Communicating with students (e.g., via WhatsApp/Google Classroom)

- ☐ Melakukan penilaian atau koreksi tugas secara digital 176 (49.2%)
  Conducting digital assessment or grading
- ☐ Mengelola administrasi kelas (jadwal, presensi, nilai) 248 (69.3%)
  Managing class administration (schedule, attendance, grades)

---

13. Apa kendala utama Anda dalam menggunakan TIK (Teknologi Informasi dan Komunikasi) di sekolah Anda? (boleh pilih lebih dari satu)
13. What are the main challenges you face in using ICT (Information and Communication Technology) at your school? (multiple choice allowed)

- ☐ Koneksi internet terbatas 183 (51.1%)
  Limited internet connection
- ☐ Kurangnya perangkat (laptop/HP) 103 (28.8%)
  Lack of devices (laptop/phone)
- ☐ Kurangnya keahlian mengoperasikan teknologi 81 (22.6%)
  Lack of skills in operating technology
- ☐ Kurangnya dukungan dari sekolah 57 (15.9%)
  Lack of support from the school
- ☐ Lainnya 98 (27.4%)
  Others

---

14. Apakah Anda mengetahui apa yang dimaksud dengan kecerdasan buatan (AI)?
14. Are you familiar with what artificial intelligence (AI) means?

- ☐ Ya, saya tau dan penggunaan aktif 54.2%
  Yes, I know and actively use it
- ☐ Ya, saya tau dan pernah mencoba 39.1%
  Yes, I know and have tried it
- ☐ Ya, saya tau tapi tidak pernah menggunakan 5.3%
  Yes, I know but have never used it
- ☐ Tidak mengetahui 1.4%
  Not familiar

---

15. Seberapa sering Anda menggunakan LLM (*Large Language Model*) seperti ChatGPT, Gemini, Claude, atau sejenisnya?
15. How often do you use LLMs (Large Language Models) such as ChatGPT, Gemini, Claude, or similar?

- ☐ Sangat sering 26.8%
  Very often
- ☐ Sering 34.6%
  Often
- ☐ Kadang-kadang 27.9%
  Sometimes
- ☐ Jarang 8.7%
  Rarely
- ☐ Tidak pernah 2%
  Never

---

16. Seberapa sering Anda menggunakan mesin penerjemah (misalnya *Google Translate*)?
16. How often do you use machine translation tools (e.g., Google Translate)?

- ☐ Sangat sering 13.4%
  Very often
- ☐ Sering 31.3%
  Often
- ☐ Kadang-kadang 39.9%
  Sometimes
- ☐ Jarang 14.2%
  Rarely
- ☐ Tidak pernah 1.1%
  Never

---

17. Seberapa sering Anda menggunakan aplikasi pengubah teks-ke-suara atau suara-ke-teks (misalnya *Google Speech-to-Text*)?
17. How often do you use text-to-speech or speech-to-text applications (e.g., Google Speech-to-Text)?

- ☐ Sangat sering 6.1%
  Very often
- ☐ Sering 18.4%
  Often
- ☐ Kadang-kadang 33.5%
  Sometimes
- ☐ Jarang 29.3%
  Rarely
- ☐ Tidak pernah 12.6%
  Never

---

18. Seberapa sering Anda menggunakan aplikasi pembuat gambar/video berbasis AI (misalnya Canva AI, DALL·E, dll)?
18. How often do you use AI-based image/video generation applications (e.g., Canva AI, DALL·E, etc.)?

- ☐ Sangat sering 25.7%
  Very often
- ☐ Sering 30.4%
  Often
- ☐ Kadang-kadang 23.7%
  Sometimes
- ☐ Jarang 16.2%
  Rarely
- ☐ Tidak pernah 3.9%
  Never

---

19. Seberapa sering Anda menggunakan aplikasi pengecek tata bahasa dan ejaan (misalnya Grammarly)?
19. How often do you use grammar and spelling checker applications (e.g., Grammarly)?

- ☐ Sangat sering 6.4%
  Very often
- ☐ Sering 20.7%
  Often
- ☐ Kadang-kadang 35.2%
  Sometimes
- ☐ Jarang 23.2%
  Rarely
- ☐ Tidak pernah 14.5%
  Never

---

20. Bahasa apa yang Anda gunakan ketika berinteraksi dengan AI? (boleh pilih lebih dari satu)
20. Which language(s) do you use when interacting with AI? (multiple choice allowed)

- ☐ Bahasa Indonesia 339 (94.7%)
  Indonesian
- ☐ Bahasa Inggris 151 (42.2%)
  English
- ☐ Bahasa daerah (misalnya Jawa, Sunda, dll) 24 (6.7%)
  Regional languages (e.g., Javanese, Sundanese, etc.)

Pertanyaan terkait penggunaan Artificial Intelligence (AI) dalam profesionalisme pekerjaan
Questions on the use of Artificial Intelligence (AI) in professional work

21. Dalam 30 hari terakhir, rata-rata berapa jam per minggu Anda memakai AI **untuk kegiatan mengajar**?
*21. In the last 30 days, on average how many hours per week did you use AI **for teaching activities**?*

- ☐ 0 jam 2.2%
  0 hours
- ☐ Kurang dari 1 jam 16.8%
  Less than 1 hour
- ☐ 1–2 jam 27.1%
  1–2 hours
- ☐ 3–5 jam 33.5%
  3–5 hours
- ☐ 6–10 jam 15.1%
  6–10 hours
- ☐ Lebih dari 10 jam 5.3%
  More than 10 hours

---

22. Seberapa sering Anda menggunakan AI untuk memperdalam **pengetahuan** pada mata pelajaran yang diampu?
*22. How often do you use AI to deepen your **knowledge** of the subjects you teach?*

- ☐ Sangat sering 22.9%
  Very often
- ☐ Sering 45.5%
  Often
- ☐ Kadang-kadang 21.5%
  Sometimes
- ☐ Jarang 8.1%
  Rarely
- ☐ Tidak pernah 2%
  Never

---

23. Alat berbasis AI apa saja yang pernah Anda gunakan untuk memperdalam **pengetahuan** dalam mata pelajaran yang Anda ajarkan? (Pilih semua yang sesuai, boleh kosong)
*23. Which AI-based tools have you used to deepen your **knowledge** of the subjects you teach? (Select all that apply, may be left blank)*

- ☐ LLM seperti ChatGPT, Gemini, Claude 309 (87.3%)
  LLMs such as ChatGPT, Gemini, Claude
- ☐ Mesin penerjemah (misalnya Google Translate) 214 (60.5%)
  Machine translation (e.g., Google Translate)
- ☐ Aplikasi pengubah teks-ke-suara atau aplikasi pengubah suara-ke-teks 91 (25.7%)
  Text-to-speech or speech-to-text applications
- ☐ Aplikasi pembuat gambar otomatis (dengan mengetikkan deskripsi gambar) 126 (35.6%)
  Automatic image generation applications (by typing image descriptions)
- ☐ Aplikasi pembuat video otomatis (dengan mengetikkan deskripsi video) 80 (22.6%)
  Automatic video generation applications (by typing video descriptions)
- ☐ Aplikasi pengecek tata bahasa dan ejaan (misalnya Grammarly) 90 (25.4%)
  Grammar and spelling checker applications (e.g., Grammarly)

---

24. Apakah Anda merasa puas menggunakan AI untuk memperdalam **pengetahuan** pada mata pelajaran yang diampu?
*24. Are you satisfied with using AI to deepen your **knowledge** of the subjects you teach?*

- ☐ Sangat tidak puas 2.2%
  Very dissatisfied
- ☐ Tidak puas 1.4%
  Dissatisfied
- ☐ Cukup puas 27.7%
  Moderately satisfied
- ☐ Puas 39.7%
  Satisfied
- ☐ Sangat puas 27.7%
  Very satisfied
- ☐ Tidak relevan (karena tidak pernah) 1.4%
  Not applicable (never used)

---

25. Seberapa sering Anda menggunakan AI untuk **mengembangkan metode / strategi pembelajaran**? (Contoh: teori belajar, membuat RPP, mengelola kelas, menerapkan metode ajar)
*25. How often do you use AI to **develop teaching methods / learning strategies**? (Examples: learning theory, creating lesson plans (RPP), classroom management, applying teaching methods)*

- ☐ Sangat sering 22.1%
  Very often
- ☐ Sering 42.5%
  Often
- ☐ Kadang-kadang 24.3%
  Sometimes
- ☐ Jarang 8.7%
  Rarely
- ☐ Tidak pernah 2.5%
  Never

---

26. Alat berbasis AI apa saja yang pernah Anda gunakan untuk **mengembangkan metode / strategi pembelajaran**? (Pilih semua yang sesuai, boleh kosong)
*26. Which AI-based tools have you used to **develop teaching methods / learning strategies**? (Select all that apply, may be left blank)*

- ☐ LLM seperti ChatGPT, Gemini, Claude 312 (87.2%)
  LLMs such as ChatGPT, Gemini, Claude
- ☐ Mesin penerjemah (misalnya Google Translate) 163 (45.5%)
  Machine translation (e.g., Google Translate)
- ☐ Aplikasi pengubah teks-ke-suara atau aplikasi pengubah suara-ke-teks 68 (19%)
  Text-to-speech or speech-to-text applications
- ☐ Aplikasi pembuat gambar otomatis (dengan mengetikkan deskripsi gambar) 124 (34.6%)
  Automatic image generation applications (by typing image descriptions)
- ☐ Aplikasi pembuat video otomatis (dengan mengetikkan deskripsi video) 72 (20.1%)
  Automatic video generation applications (by typing video descriptions)
- ☐ Aplikasi pengecek tata bahasa dan ejaan (misalnya Grammarly) 79 (22.1%)
  Grammar and spelling checker applications (e.g., Grammarly)

---

27. Apakah Anda merasa puas menggunakan AI untuk **mengembangkan metode / strategi pembelajaran**?
*27. Are you satisfied with using AI to **develop teaching methods / learning strategies**?*

- ☐ Sangat tidak puas 1.1%
  Very dissatisfied
- ☐ Tidak puas 0.8%
  Dissatisfied
- ☐ Cukup puas 27.7%
  Moderately satisfied
- ☐ Puas 41.3%
  Satisfied
- ☐ Sangat puas 26.5%
  Very satisfied
- ☐ Tidak relevan (karena tidak pernah) 2.5%
  Not applicable (never used)

---

28. Seberapa sering Anda menggunakan AI untuk **asesmen dan evaluasi** pembelajaran? (Contoh: membuat soal formatif dan sumatif, membuat rubrik penilaian, menganalisis nilai untuk perbaikan pembelajaran)
*28. How often do you use AI for **learning assessment and evaluation**? (Examples: creating formative and summative questions, designing assessment rubrics, analyzing scores for learning improvement)*

- ☐ Sangat sering 21.2%
  Very often
- ☐ Sering 44.1%
  Often
- ☐ Kadang-kadang 27.7%
  Sometimes
- ☐ Jarang 6.2%
  Rarely
- ☐ Tidak pernah 0.8%
  Never

---

29. Alat berbasis AI apa saja yang pernah Anda gunakan untuk **asesmen dan evaluasi** pembelajaran? (Pilih semua yang sesuai, boleh kosong)
*29. Which AI-based tools have you used for **learning assessment and evaluation**? (Select all that apply, may be left blank)*

- ☐ LLM seperti ChatGPT, Gemini, Claude 314 (87.7%)
  LLMs such as ChatGPT, Gemini, Claude
- ☐ Mesin penerjemah (misalnya Google Translate) 137 (38.3%)
  Machine translation (e.g., Google Translate)
- ☐ Aplikasi pengubah teks-ke-suara atau aplikasi pengubah suara-ke-teks 49 (13.7%)
  Text-to-speech or speech-to-text applications
- ☐ Aplikasi pembuat gambar otomatis (dengan mengetikkan deskripsi gambar) 90 (25.1%)
  Automatic image generation applications (by typing image descriptions)
- ☐ Aplikasi pembuat video otomatis (dengan mengetikkan deskripsi video) 50 (14%)
  Automatic video generation applications (by typing video descriptions)
- ☐ Aplikasi pengecek tata bahasa dan ejaan (misalnya Grammarly) 78 (21.8%)
  Grammar and spelling checker applications (e.g., Grammarly)

---

30. Apakah Anda merasa puas menggunakan AI untuk **asesmen dan evaluasi** pembelajaran?
*30. Are you satisfied with using AI for **learning assessment and evaluation**?*

- ☐ Sangat tidak puas 1.1%
  Very dissatisfied
- ☐ Tidak puas 0.8%
  Dissatisfied
- ☐ Cukup puas 31%
  Moderately satisfied
- ☐ Puas 39.4%
  Satisfied
- ☐ Sangat puas 22.6%
  Very satisfied
- ☐ Tidak relevan (karena tidak pernah) 5%
  Not applicable (never used)

---

31. Seberapa sering Anda menggunakan AI untuk pengembangan **kurikulum**? (Contoh: menyusun silabus, mengintegrasikan pembelajaran lintas mata pembelajaran, menyusun pembelajaran tematik, dll)
*31. How often do you use AI for **curriculum** development? (Examples: designing syllabi, integrating cross-subject learning, developing thematic learning, etc.)*

- ☐ Sangat sering 16.8%
  Very often
- ☐ Sering 34.4%
  Often

- ☐ Kadang-kadang 33%
  Sometimes
- ☐ Jarang 10.6%
  Rarely
- ☐ Tidak pernah 5.3%
  Never

---

32. Alat berbasis AI apa saja yang pernah Anda gunakan untuk pengembangan **kurikulum**? (Pilih semua yang sesuai, boleh kosong)
*32. Which AI-based tools have you used for **curriculum** development? (Select all that apply, may be left blank)*

- ☐ LLM seperti ChatGPT, Gemini, Claude 302 (88.6%)
  LLMs such as ChatGPT, Gemini, Claude
- ☐ Mesin penerjemah (misalnya Google Translate) 135 (39.6%)
  Machine translation (e.g., Google Translate)
- ☐ Aplikasi pengubah teks-ke-suara atau aplikasi pengubah suara-ke-teks 60 (17.6%)
  Text-to-speech or speech-to-text applications
- ☐ Aplikasi pembuat gambar otomatis (dengan mengetikkan deskripsi gambar) 93 (27.3%)
  Automatic image generation applications (by typing image descriptions)
- ☐ Aplikasi pembuat video otomatis (dengan mengetikkan deskripsi video) 48 (14.1%)
  Automatic video generation applications (by typing video descriptions)
- ☐ Aplikasi pengecek tata bahasa dan ejaan (misalnya Grammarly) 74 (21.7%)
  Grammar and spelling checker applications (e.g., Grammarly)

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33. Apakah Anda merasa puas menggunakan AI untuk pengembangan **kurikulum**?
*33. Are you satisfied with using AI for **curriculum** development?*

- ☐ Sangat tidak puas 1.1%
  Very dissatisfied
- ☐ Tidak puas 1.4%
  Dissatisfied
- ☐ Cukup puas 30.2%
  Moderately satisfied
- ☐ Puas 41.6%
  Satisfied
- ☐ Sangat puas 19.3%
  Very satisfied
- ☐ Tidak relevan (karena tidak pernah) 6.4%
  Not applicable (never used)

---

34. Seberapa sering Anda menggunakan AI untuk mengembangkan **media pembelajaran**?
*34. How often do you use AI to develop **learning media**?*

- ☐ Sangat sering 22.1%
  Very often
- ☐ Sering 45%
  Often
- ☐ Kadang-kadang 22.6%
  Sometimes
- ☐ Jarang 8.4%
  Rarely
- ☐ Tidak pernah 2%
  Never

---

35. Alat berbasis AI apa saja yang pernah Anda gunakan untuk mengembangkan **media pembelajaran**? (Pilih semua yang sesuai, boleh kosong)
*35. Which AI-based tools have you used to develop **learning media**? (Select all that apply, may be left blank)*

- ☐ LLM seperti ChatGPT, Gemini, Claude 304 (86.9%)
  LLMs such as ChatGPT, Gemini, Claude
- ☐ Mesin penerjemah (misalnya Google Translate) 139 (39.7%)
  Machine translation (e.g., Google Translate)
- ☐ Aplikasi pengubah teks-ke-suara atau aplikasi pengubah suara-ke-teks 81 (23.1%)
  Text-to-speech or speech-to-text applications
- ☐ Aplikasi pembuat gambar otomatis (dengan mengetikkan deskripsi gambar) 143 (40.9%)
  Automatic image generation applications (by typing image descriptions)
- ☐ Aplikasi pembuat video otomatis (dengan mengetikkan deskripsi video) 98 (28%)
  Automatic video generation applications (by typing video descriptions)
- ☐ Aplikasi pengecek tata bahasa dan ejaan (misalnya Grammarly) 66 (18.9%)
  Grammar and spelling checker applications (e.g., Grammarly)

36. Apakah Anda merasa puas menggunakan AI untuk mengembangkan **media pembelajaran**?
*36. Are you satisfied with using AI to develop **learning media**?*

- ☐ Sangat tidak puas 0.8%
  Very dissatisfied
- ☐ Tidak puas 1.4%
  Dissatisfied
- ☐ Cukup puas 26.5%
  Moderately satisfied
- ☐ Puas 45.8%
  Satisfied
- ☐ Sangat puas 23.2%
  Very satisfied
- ☐ Tidak relevan (karena tidak pernah) 2.2%
  Not applicable (never used)

37. Seberapa sering Anda menggunakan AI untuk **profesionalisme kerja**? (contoh: komunikasi dengan rekan sejawat dan orangtua, referensi etika mengajar, dll)
*37. How often do you use AI for **professional work practice**? (examples: communication with colleagues and parents, references on teaching ethics, etc.)*

- ☐ Sangat sering 17.9%
  Very often
- ☐ Sering 34.9%
  Often
- ☐ Kadang-kadang 30.7%
  Sometimes
- ☐ Jarang 10.3%
  Rarely
- ☐ Tidak pernah 6.1%
  Never

38. Alat berbasis AI apa saja yang pernah Anda gunakan untuk **profesionalisme kerja**? (Pilih semua yang sesuai, boleh kosong)
*38. Which AI-based tools have you used for **professional work practice**? (Select all that apply, may be left blank)*

- ☐ LLM seperti ChatGPT, Gemini, Claude 288 (85.5%)
  LLMs such as ChatGPT, Gemini, Claude
- ☐ Mesin penerjemah (misalnya Google Translate) 152 (45.1%)
  Machine translation (e.g., Google Translate)
- ☐ Aplikasi pengubah teks-ke-suara atau aplikasi pengubah suara-ke-teks 64 (19%)
  Text-to-speech or speech-to-text applications
- ☐ Aplikasi pembuat gambar otomatis (dengan mengetikkan deskripsi gambar) 83 (24.6%)
  Automatic image generation applications (by typing image descriptions)
- ☐ Aplikasi pembuat video otomatis (dengan mengetikkan deskripsi video) 54 (16%)
  Automatic video generation applications (by typing video descriptions)
- ☐ Aplikasi pengecek tata bahasa dan ejaan (misalnya Grammarly) 62 (18.4%)
  Grammar and spelling checker applications (e.g., Grammarly)

39. Apakah Anda merasa puas menggunakan AI untuk **profesionalisme kerja**?
*39. Are you satisfied with using AI for **professional work practice**?*

- ☐ Sangat tidak puas 0.8%
  Very dissatisfied
- ☐ Tidak puas 0.8%
  Dissatisfied
- ☐ Cukup puas 33.2%
  Moderately satisfied
- ☐ Puas 42.7%
  Satisfied
- ☐ Sangat puas 18.7%
  Very satisfied
- ☐ Tidak relevan (karena tidak pernah) 3.6%
  Not applicable (never used)

40. Aspek mana yang paling Anda butuhkan dari AI/LLM? (Boleh kosong atau pilih lebih dari satu)
40. Which aspects do you most need from AI/LLMs? (May be left blank or select more than one)

- ☐ Membuat soal latihan dan ujian 74.9%
  Creating practice and exam questions
- ☐ Merancang silabus atau RPP 71.7%
  Designing syllabi or lesson plans (RPP)

- ☐ Memberikan umpan balik terhadap jawaban siswa 33.8%
  Providing feedback on students' answers
- ☐ Memeriksa jawaban siswa secara otomatis 41.6%
  Automatically grading students' answers
- ☐ Membuat media ajar visual (poster, komik, infografis) 69.4%
  Creating visual teaching media (posters, comics, infographics)
- ☐ Membuat media ajar interaktif (video, animasi, kuis digital) 71.4%
  Creating interactive teaching media (videos, animations, digital quizzes)
- ☐ Menyusun materi ajar (teks, ringkasan, contoh soal, dll.) 69.1%
  Preparing teaching materials (texts, summaries, sample questions, etc.)
- ☐ AI sebagai tutor pendamping bagi siswa untuk menjelaskan materi lebih lanjut 30.3%
  AI as a supporting tutor for students to explain materials in more depth
- ☐ Membantu siswa dengan kebutuhan khusus (misalnya anak autisme atau ADHD) 21.7%
  Assisting students with special needs (e.g., children with autism or ADHD)
- ☐ Membantu penerjemahan atau pembelajaran bahasa asing/daerah 32.9%
  Assisting with translation or foreign/regional language learning
- ☐ Memberikan ide metode atau strategi mengajar yang lebih kreatif 51.4%
  Providing ideas for more creative teaching methods or strategies
- ☐ Membantu guru dalam administrasi kelas (presensi, rekap nilai, laporan) 50.3%
  Assisting teachers with classroom administration (attendance, grade summaries, reports)
- ☐ Membantu penelitian tindakan kelas atau refleksi mengajar 39%
  Assisting with classroom action research or teaching reflection

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41. Menurut Anda, tantangan apa saja yang pernah Anda alami ketika menggunakan AI/LLM untuk pembelajaran (menambah pengetahuan, membuat soal, RPP, memeriksa jawaban, dll.)? (Boleh kosong atau pilih lebih dari satu)

41. In your view, what challenges have you experienced when using AI/LLMs for learning (building knowledge, creating questions, lesson plans, grading, etc.)? (May be left blank or select more than one)

- ☐ Jawaban AI tidak runtut/strukturnya membingungkan 33.1%
  AI answers are not coherent/the structure is confusing
- ☐ Bahasa AI sulit dipahami siswa (terlalu teknis, asing, atau tidak sesuai jenjang) 23.4%
  AI language is hard for students to understand (too technical, foreign, or not level-appropriate)
- ☐ Konten salah atau tidak faktual (keliru, menyesatkan, atau halusinasi) 21.4%
  Content is incorrect or non-factual (erroneous, misleading, or hallucinated)
- ☐ Masalah pada gambar buatan AI (misalnya visualisasi tidak akurat, mengandung bias, atau tidak pantas) 31.8%
  Issues with AI-generated images (e.g., inaccurate visualization, bias, or inappropriate content)
- ☐ AI tidak mampu menyesuaikan jawaban dengan tingkat kemampuan siswa 24.7%
  AI cannot adapt answers to students' ability levels
- ☐ Feedback dari AI terlalu umum/tidak spesifik 39%
  Feedback from AI is too general/not specific
- ☐ Materi tidak sesuai dengan kurikulum atau konteks lokal 11.7%
  Material does not align with the curriculum or local context
- ☐ Terlalu bergantung pada AI sehingga mengurangi kreativitas guru 34.4%
  Over-reliance on AI reduces teacher creativity
- ☐ Tidak jelas siapa pemilik hak cipta atas konten yang dibuat AI 27.9%
  Unclear who owns the copyright of AI-generated content
- ☐ Keterbatasan akses dan teknologi (internet, perangkat, biaya berlangganan, dsb.) 35.7%
  Limitations in access and technology (internet, devices, subscription costs, etc.)

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42. Apa warna bendera Indonesia?
42. What are the colors of the Indonesian flag?

- ☐ Merah Biru 0.3%
  Red Blue
- ☐ Merah Putih 99.7%
  Red White
- ☐ Merah Kuning 0%
  Red Yellow

This is the second attention-check question used for response validation. Respondents who did not select "Merah Putih" (red and white) were excluded from the analysis.

Observasi Guru Terhadap Penggunaan LLM oleh Siswa
Teacher Observations on Students' Use of LLMs

43. Menurut pengamatan Anda, bagaimana dampak **penggunaan LLM oleh siswa** terhadap kualitas hasil pembelajaran mereka?
*43. Based on your observation, what is the impact of **students' use of LLMs** on the quality of their learning outcomes?*

- ☐ Sangat baik 11.5%
  Very positive
- ☐ Baik 46.4%
  Positive
- ☐ Netral 28.5%
  Neutral
- ☐ Buruk 8.4%
  Negative
- ☐ Sangat Buruk 0.6%
  Very negative
- ☐ Tidak pernah mengamati 4.7%
  Never observed

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44. *LLM seperti ChatGPT kadang memberikan jawaban yang tidak benar.* Menurut Anda, apakah siswa mampu membedakan jawaban LLM yang benar dan salah?
44. LLMs such as ChatGPT sometimes provide incorrect answers. In your view, are students able to distinguish between correct and incorrect LLM responses?

- ☐ Mampu menjelaskan dengan baik 18.7%
  Able to explain well
- ☐ Mampu menjelaskan sebagian 35.2%
  Able to explain partially
- ☐ Kesulitan menjelaskan 29.3%
  Struggle to explain
- ☐ Tidak bisa menjelaskan sama sekali 9.5%
  Unable to explain at all
- ☐ Tidak pernah mengamati 7.3%
  Never observed

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45. LLM seperti ChatGPT tidak seharusnya digunakan oleh siswa.
45. LLMs such as ChatGPT should not be used by students.

- ☐ Setuju 43%
  Agree
- ☐ Tidak setuju 57%
  Disagree

B Types of LT Tools Used by Teachers

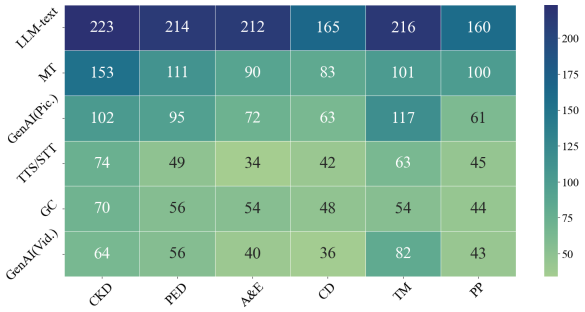

Figure 2: Types of AI tools commonly used by teachers in Indonesia across components of effective teaching and learning. LLM-text = large language models (e.g., ChatGPT, Gemini); MT = machine translation; GenAI(Pic.) = image-generative AI; TTS/STT = text-to-speech/speech-to-text; GC = grammar checkers; GenAI(Vid.) = video-generative AI. CKD = Content Knowledge Development; PED = Pedagogy; A&E = Assessment and Evaluation; CD = Curriculum Development; TM = Teaching Media; PP = Professional Practice.