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Categorization of Practical Use Cases in Generative AI Pilot Schools in Japan

Shuhei NISHIMOTO, Shinsuke INOUE, Hikari YOSHIZAWA, Izumi HORIKOSHI & Takanori SHIGI
Uchidayoko Institute for Education Research, UCHIDA YOKO CO., Ltd., Japan
shuhei-nishimoto@uchida.co.jp

Abstract: This study categorized the trends of the initial stages of generative AI utilization based on use cases from all 52 pilot schools designated in FY 2023. The results showed that students often used generative AI to develop and elaborate their ideas, as well as to create drawings, music, and stories, while teachers frequently used it for drafting documents. Additionally, high schools had more advanced use cases, such as detailed input prompts for program creation.

Keywords: Generative AI, Primary and secondary education, Use case study, Japan

1. Introduction

In Japan, the Ministry of Education, Culture, Sports, Science and Technology (MEXT) launched the Leading DX School Project to explore ICT use; Under this initiative, generative AI pilot schools were set up to promote AI-driven teaching and administration (MEXT, 2023a).

This study set the following two research questions: RQ1: What categories existed in the use of generative AI in educational settings? RQ2: What are the current trends in its use? To address these, this study categorized 266 use cases of generative AI pilot schools from FY 2023, published as final reports on the Leading DX School website—first by the role (RQ1) and then by type of use, school type, and subject (RQ2).

2. Results and Discussion

2.1 Categorization based on the roles of Generative AI (RQ1)

Based on the use cases, the roles of generative AI have been categorized into five categories and twenty items, as shown in Table 1. Additionally, the number of cases corresponding to each item in educational and administrative uses is presented.

In educational contexts, creation and idea refinement were frequently observed, suggesting that AI was leveraged to visualize students' concepts and ideas. In administrative tasks, document drafting, proposal planning, problem generation, and data analysis were common, indicating AI's contribution to streamlining school operations.

Table 1. *Number of Use Cases by Role of Generative AI*

Role of Generative AI	Educational use	Administrative use
Creation and Ideation		
Generative AI provides ideas	8	1
Refining and deepening thoughts through consultation with generative AI	26	6
Generative AI creates plans and proposals	12	17
Generative AI creates drawings, music, stories, etc.	40	10
Document Creation		
Generative AI drafts documents	7	27

Generative AI corrects and edits texts	19	10
Generative AI summarizes texts	4	4
Generative AI translates texts	2	2
Data Processing and Analysis		
Generative AI organizes and analyzes data	3	14
Generative AI extracts information from images and videos	2	0
Learning and Problem-Solving Support		
Generative AI checks and evaluates	13	2
Generative AI explains and clarifies	19	6
Generative AI generates problems	13	17
Generative AI creates programs and code	10	12
Generative AI solves problems and calculates	9	0
Generative AI checks pronunciation	4	0
Generative AI reads texts aloud	2	0
Dialogue and Communication		
Generative AI acts as a debate partner	6	0
Generative AI plays a persona	3	0
Generative AI acts as an English conversation partner	8	0
Total	210	128

2.2 Quantitative trends for categories (RQ2)

In addition to categorizing the roles of generative AI, we also summarized the number of cases by type of use, school type, and subject. Educational use cases totaled 176, surpassing the 102 administrative cases. This result is unexpected, considering that Japan's guidelines on generative AI use emphasized the usefulness of generative AI in administrative tasks (MEXT, 2023b). Moreover, educational use cases were frequently observed in high schools. This was likely because high school students possess higher information-utilization skills (MEXT, 2023c) and had a solid foundation for leveraging generative AI. In fact, 7 of the 10 cases requiring advanced prompt input (e.g., program creation) occurred at high school. Finally, AI adoption was prominent in subjects like foreign languages (36 cases), Japanese (27), and social studies (21), which involve expressing one's thoughts through writing, while its application in practical subjects like art (6), physical education (5), and music (3) was limited.

3. Conclusion

This study has categorized the use cases of FY 2023 generative AI pilot schools to address RQ1 and RQ2. For RQ1, we identified five major categories comprising 20 use case items. Regarding RQ2, we found the following: educational use cases surpassed administrative ones; high schools exhibited many advanced educational use cases; and adoption was especially high in subjects that involve expressing one's thinking through writing.

Although this study is limited to FY 2023 pilot schools and, despite employing only descriptive analysis, it successfully presents the first systematic taxonomy of generative AI use cases in Japanese primary and secondary education. As AI tools and operational guidelines continue to evolve rapidly, future work will prioritize longitudinal data collection and empirical research to assess long-term trends and causal relationships.

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