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### Research Article

## A Longitudinal Survey of LMS Preference: Google Classroom vs. Moodle

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### Abstract

This study investigates student preferences for Learning Management Systems (LMS) in a private women's university in Japan, comparing Google Classroom and Moodle through a longitudinal survey conducted in July 2022 and July 2023. The transition from Moodle to a dual-use scenario with Google Classroom for one year, primarily driven by the need to reduce external maintenance costs, prompted an evaluation of student attitudes towards each platform. Results reveal a notable preference for Google Classroom due to its user-friendly interface, integration with Google Suite, and effective notification system. Despite this shift, Moodle remained preferred by some students for its familiarity and robust features. These findings provide insights into how LMS preferences evolve with increased exposure and shifting educational contexts, offering valuable guidance for future technological integrations in higher education.

本研究は、日本の私立女子大学における学習管理システム(LMS)に対する学生の志向を調査したものである。2022年7月と2023年7月に実施した縦断的調査を通して、Google ClassroomとMoodleを比較した。外部メンテナンスコストを削減する必要性から、1年をかけてMoodleとGoogle Classroomの併用体制へと移行され、各プラットフォームに対する学生の意識を評価した結果、使いやすいインターフェイス、Google Suiteとの統合、効果的な通知システムにより、Google Classroomが好まれることが判明した。この変化にもかかわらず、Moodleはその親しみやすさと充実した特徴により、一部の学生から選択される傾向があった。これらの調査結果は、LMSの利用が増加し教育的背景が変化するにつれ、高等教育における将来の技術的統合に対する貴重な指針を提供するものである。

Technology integration into education has traditionally been a gradual process, particularly in Japan where many English education programs at universities have historically relied on paper-based materials and face-to-face interactions. Before the COVID-19 pandemic, the use of technological tools in these programs was minimal, and classes were predominantly conducted without leveraging modern digital technologies. However, the pandemic necessitated a rapid shift towards digital solutions, highlighting the crucial role of Information and Communication Technology (ICT) and Learning Management Systems (LMS) in contemporary education (Butler, 2022; Gabarre & Gabarre, 2010; Matte et al., 2024; Sabiri, 2020; Swenson et al., 2023).

Our institution, a private women's university in Japan, has a long history of embracing technological advancements. Computer laboratories, currently consisting of five PC rooms and one Mac room, were installed in 1991. The university pioneered an initiative where students were provided with iPods to access digital textbooks and other learning resources. In 2012, iPads became the primary learning device for students and the university has been an Apple Distinguished School since 2017. The use of the Moodle LMS was adopted in 2004 and Google Classroom was introduced in 2015. Prior to the pandemic, Moodle was the designated LMS, serving as the primary platform for course management and student engagement.

The onset of the COVID-19 pandemic significantly altered the educational landscape, as remote learning became a necessity. During this period, the university encouraged all faculty members, including those unfamiliar with an LMS, to integrate Google Classroom into their teaching practices and transfer content from Moodle if they were using it during a transition year. Google Classroom was chosen to supplement and eventually replace Moodle because of its integration with other Google Workspace applications already in use. As a result, students found themselves using both Google Classroom and Moodle (version 3.5.1+) simultaneously. This dual-LMS environment provided a unique opportunity to directly compare two platforms under real-world conditions, uncommon in LMS studies, through a comprehensive evaluation of student preferences and experiences with each platform. This was evaluated through a longitudinal survey of student LMS preferences, conducted over two time points: July 2022 and July 2023. The primary goal was to assess how student attitudes towards each LMS evolved and to identify the reasons behind their preferences.

Both Google Classroom and Moodle offer distinct functionalities that impact the learning experience,

including communication, collaboration, assignment submission, and progress tracking. Understanding student preferences is critical, as it provides insights into how the choice of LMS influences student satisfaction and educational outcomes.

## Literature Review

The integration of Learning Management Systems (LMS) into educational settings has been a topic of significant research, particularly in terms of their impact on student learning experiences and outcomes. This literature review explores the evolution of LMS platforms, their role in higher education, and the factors influencing student preferences, with a particular focus on Google Classroom and Moodle.

### Evolution and Impact of LMS Platforms

The use of LMS in education has grown substantially over the past two decades, driven by advancements in technology and the increasing need for digital tools in learning environments. Early LMS platforms like Blackboard and Moodle laid the foundation for online learning management by offering basic functionalities such as course materials distribution, communication tools, and assignment submission (Gabarre & Gabarre, 2010). The first version of Moodle was released in 2002 and became popular due to its open-source nature and customization capabilities, allowing institutions to tailor the platform to their needs (Moodle, 2023).

The release of Google Classroom in 2014 marked a significant shift towards more integrated and user-friendly LMS solutions. Google Classroom, part of Google's suite of educational tools, was designed to streamline workflow and enhance collaboration by integrating seamlessly with Google Drive and other Google applications. This integration aimed to simplify managing assignments and communications, addressing some limitations associated with earlier LMS platforms like Moodle (Butler, 2022).

While LMS platforms offer numerous benefits, there are several drawbacks including the inherent risk of technological issues regarding software, connectivity, and privacy. Additionally, there are associated costs with the initial setup and ongoing maintenance of any LMS, which can require significant time and resource commitments, including training for faculty, staff, and students.

### Student Attitudes Towards LMS

Research has shown that student attitudes towards LMS are influenced by various factors, including usability, accessibility, and functionality. For instance, students appreciate LMS platforms that facilitate easy communication, collaboration, and access to course materials (Swenson et al., 2023). The ease of use and intuitive design of Google Classroom have been highlighted as key factors in its rapid adoption during the COVID-19 pandemic. Google Classroom's integration with Google's ecosystem of tools allows for a more seamless experience in assignment submission and document management. Kassim et al. (2024) highlighted that Malaysian university students also have positive attitudes towards Google Classroom, valuing the ease of use and educational benefits, emphasizing its simplicity and intuitive interface as key benefits. Similarly, Moonma (2021) emphasized that second-year Thai EFL university students rated the ease of use highly, found it useful, and showed a strong intention to use it. (Similarly, these sentiments were echoed by Malaysian (Kassim et al., 2024) and second-year Thai EFL (Moonma, 2021) university students who reported positively regarding ease of use, simplicity, and its intuitive user interface.) In contrast, Moodle's more complex interface and features, while robust, have been critiqued for their steeper learning curve and less user-friendly design (Matte et al., 2024).

### Comparison of Google Classroom and Moodle

Comparative studies of LMS platforms often highlight the strengths and weaknesses of each system. Research comparing Google Classroom and Moodle indicates that while Google Classroom is favored for its simplicity and ease of integration with other Google services, Moodle offers greater flexibility and customization options for institutions (Sabiri, 2020). Google Classroom's intuitive interface and efficient notification system have been identified as significant advantages, particularly in scenarios requiring rapid adaptation to remote learning (Swenson et al., 2023).

On the other hand, Moodle's robust set of features, including advanced tracking and reporting tools, make it a preferred choice for institutions with specific needs for detailed course management and assessment (Gabarre & Gabarre, 2010). The platform's ability to support various pedagogical approaches and integrate with different educational technologies provides depth that some educators and institutions find valuable (Butler, 2022).

### Impact of the COVID-19 Pandemic

The COVID-19 pandemic drastically accelerated the adoption and utilization of LMS platforms as institutions worldwide shifted to remote learning. The transition to Emergency Remote Teaching (ERT) highlighted the importance of LMS in maintaining educational continuity. Erlam (2021) emphasized that educators need to quickly adapt to new

tools and manage teaching processes effectively, emphasizing how the introduction of LMS supported the quality of education. Studies during this period found that platforms like Google Classroom saw increased usage due to their user-friendly design and integration with other digital tools (Matte et al., 2024). Conversely, Moodle's established presence and customization options continued to support institutions that had already invested in its infrastructure.

The pandemic underscored the need for flexible and effective LMS solutions, revealing both the strengths and limitations of different platforms. As institutions adapted to new modes of teaching, the choice of LMS became increasingly critical in ensuring effective communication, assignment management, and overall student engagement (Sabiri, 2020; Swenson et al., 2023).

### Gaps

While there is considerable research on the general effectiveness of LMS platforms, studies specifically comparing Google Classroom and Moodle in the context of Japanese higher education remain limited, especially in contexts where multiple platforms are used simultaneously. Additionally, there is a need for more longitudinal studies to understand how student preferences evolve over time, especially in response to technological changes and institutional shifts.

This literature review highlights the evolution and impact of LMS platforms, with a specific focus on Google Classroom and Moodle. It emphasizes the factors influencing student preferences and the significant role of LMS in adapting to remote learning challenges. The findings from this study will inform the subsequent analysis of student preferences at the private women's university, contributing to a deeper understanding of how LMS choices affect educational experiences and outcomes.

## Methodology

This study employed a longitudinal research design to investigate changes in student preferences for Learning Management Systems (LMS) over time and to explore the qualitative reasons behind these preferences. The research was conducted at a private women's university in Western Japan, focusing on the comparison between Google Classroom (Google Workspace for Education Fundamentals version) and Moodle (version 3.5.1+). Data were collected through two surveys administered at different time points to capture shifts in preferences and attitudes.

### Participants

The study participants consisted of undergraduate students enrolled at the university. All the participants were first, second, third, or fourth year students enrolled in the university's Department of International & English Interdisciplinary Studies and demonstrated mixed levels of familiarity with technology in classes. Data were collected at two points: Time 1 (T1) in July 2022 ( $n = 174$ ), and Time 2 (T2) in July 2023 ( $n = 120$ ). The sample included students who had experience using both Google Classroom and Moodle, providing a comprehensive view of their preferences and experiences with each platform.

### Survey Instrument

The primary data collection tool was a structured survey designed to assess student preferences for Google Classroom and Moodle. The survey included both quantitative and qualitative components. The quantitative questions were designed to gather data on overall preferences for each LMS. Responses were recorded on a Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

The qualitative questions asked students to provide open-ended responses explaining their preferences for one LMS over the other. These responses were intended to capture detailed insights into their experiences and the specific features they valued or found lacking in each platform.

### Data Collection Procedure

Surveys were distributed electronically to students via the university's email system. The surveys were administered with an interval of one year to track changes in LMS preferences over time.

At T1, students were asked to rate their current experiences with Moodle and Google Classroom and provide reasons for their preferences. At T2, the survey was repeated with similar questions to assess any changes in preferences and to explore if the increased use of Google Classroom during the pandemic influenced their attitudes. As the survey was available to all students, some participants in the T2 survey may also have participated in the T1 survey, but this was not tracked. This did not significantly affect the data because the surveys represented a snapshot of the student population in each year. Therefore, the data collected were about overall trends rather than about changes in a specific group of students over time.

### Data Analysis

Data from the quantitative survey responses were analyzed to determine overall satisfaction levels and

preferences for each LMS. Descriptive statistics were used to summarize the data to identify changes in preferences between T1 and T2.

Open-ended responses to the qualitative questions were analyzed using an inductive coding approach (Saldana, 2021). Responses could be submitted in either English or Japanese according to the respondents' preferences. Japanese responses were translated into English using Google Translate and were checked by a native Japanese speaking researcher. Two researchers independently coded the English versions of responses to identify common themes and patterns related to LMS preference. Multiple codes could be applied to each response depending on how many themes were identified. The codes were then compared and reconciled by the two researchers to ensure consistency and accuracy in the analysis. This process involved identifying key reasons for preferences, such as usability, integration with other tools, and notification systems.

### Validity and Reliability

To ensure the validity and reliability of the survey instrument, the survey questions were reviewed and piloted with a small group of native English-speaking and native Japanese-speaking teachers at the university ( $N = 7$ ) before the main data collection. Feedback from the pilot testing was used to refine the survey questions and improve clarity. Additionally, to enhance reliability in qualitative data analysis, multiple researchers were involved in coding and thematic analysis, and any discrepancies in coding were resolved through discussion. Spreadsheets were used for organizing coding and the creation of figures.

## Results

The results of the survey include both quantitative and qualitative data. The quantitative data relates to the percentage of respondents who prefer each LMS at each time point, separated by school year. The qualitative data consists of coded comments with illustrative quotations.

### Quantitative Results

Table 1 shows the number of responses to the question "Given the choice, which LMS would you prefer?" for each time period, broken down by year in school. The results show a much greater preference for Google Classroom over Moodle at both time periods, with the number of people preferring Moodle much less at T2 than at T1 (Figure 1).

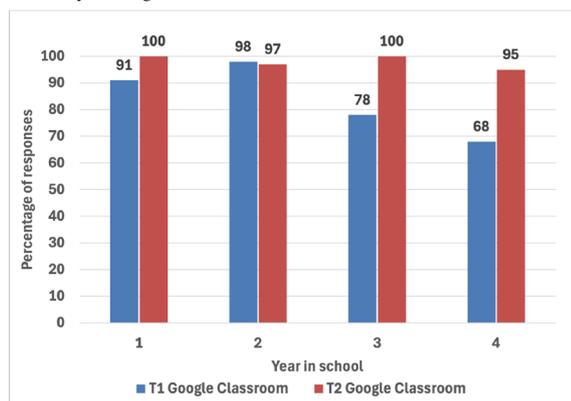
**Table 1**

*Responses to the Question "Given the choice, which LMS would you prefer?" at Time 1 and Time 2*

Year in school	Number of respondents at T1	Number of respondents who prefer Google Classroom at T1	Number of respondents who prefer Moodle at T1	Number of respondents at T2	Number of respondents who prefer Google Classroom at T2	Number of respondents who prefer Moodle at T2
1	57	52	5	31	31	0
2	43	42	1	33	32	1
3	36	28	8	19	19	0
4	38	26	12	37	35	2
Total	174	148	26	120	117	3

**Figure 1**

*Percentage of Respondents by Year in School who Prefer Google Classroom at Time 1 and Time 2*



### Qualitative Results

Each response was coded inductively, and ten categories emerged, as summarized in Table 2. As a single response may include more than one of the categories, the total number of coded responses is higher than the number of respondents. The percentages were calculated by taking the total coded responses for each category and dividing them by the total number of coded responses for each LMS preference at each time period. One thing to note is that due to the small number of people who preferred Moodle to Google Classroom, there were not as many reasons given for Moodle preference (particularly at T2), which can result in a single response resulting in a large percentage of total coded responses.

**Table 2**

*A Summary of Coded Written Responses to the Question “What is the reason for your LMS preference?” at Time 1 and Time 2*

Code	Google % T1	Google % T2	Moodle % T1	Moodle % T2
Easy to find/see information	29.3	21.7	31.0	25.0
User friendly	19.5	18.3	20.7	25.0
Easy login	19.0	11.7	0.0	0.0
Easy to submit assignments	14.6	12.2	6.9	0.0
Email notifications of assignments and deadlines	10.7	15.0	0.0	0.0
Familiarity	0.5	8.3	13.8	50.0
Platform stability	1.0	2.8	10.3	0.0
Course/schedule information available	0.0	0.0	17.2	0.0
Communicate easily with the teacher	3.9	3.9	0.0	0.0
Mobile friendly	1.5	6.1	0.0	0.0

In order to better understand the information presented in Table 2, below are some illustrative quotes for each code, with the respondent code provided.

First, Table 2 shows that the most common reason given for LMS preference for both Google Classroom and Moodle involved the ease of finding information. For example, respondent 85 wrote “Google Classroom is simpler and easier to see. There is no extraneous information and I feel it works better with Google Docs and Drive.” Meanwhile, respondent 154 wrote “I’m used to it from the beginning. Because dashboards and topics are easy to see.” This shows that both LMS can be good ways to find information, but some individuals prefer one layout over the other.

The next most common theme was user-friendliness, with similar percentages of respondents responding that they preferred Moodle and Google. Respondent 175 preferred Moodle because of the layout “It was easy to use because the items for each subject were arranged in an easy-to-understand order.” However, others found the Google experience smoother. “Submitting assignments and getting notified about pending works is easier whereas we have to keep a reminder or frequently check for deadlines on Moodle. Uploading an assignment through Classroom is much easier when compared to Moodle (respondent 123).”

One major factor regarding preferences for Google Classroom over Moodle was the ease of logging in. Many respondents mentioned the inconvenience of logging in to Moodle which at this institution required first logging in through the institution’s website. Conversely, Google Classroom has a mobile app and can also be easily accessed when logged into Google Suite services like Gmail. Likewise, Google Classroom emailed notifications of assignments and deadlines were appreciated by many respondents, while none mentioned Moodle notifications being convenient. As respondent 78 wrote “Moodle requires a login, so I can work more quickly in Google Classroom. It’s also hard to respond to Moodle notifications and chats.”

Another important consideration was ease of submitting assignments. Here we see preferences for, and problems with, both Moodle and Google Classroom. For example, respondent 162 wrote about software compatibility issues “In Google Classroom, when working on a computer, you cannot submit a Word file. The work was troublesome because it was necessary to download it as a document.” Meanwhile, another respondent (236) wrote “When it comes to submitting assignments, Moodle limits the number of files that can be submitted depending on the settings, and when you want to submit multiple assignments, you have to send an e-mail to the teachers, which takes a lot of time. On the other hand, Classroom allows multiple submissions at once, which I appreciate.”

In people who prefer Moodle, terms mentioned more often included familiarity, platform stability, and schedule information were important. In terms of familiarity, it is interesting that this, rather than a specific feature or advantage, was mentioned for Moodle more than for Google. This inertia may explain why third- and fourth-year students who may not have been using Google Classroom prior to ERT during the pandemic would prefer Moodle more than first- or second-year students (see Figure 1). For platform stability, respondent 158 mentioned “There was a lag in Google Classroom, and even if the tests started at the same time, they could not start at the same time.” Finally, at

this institution Moodle was the primary source for school administration information for students, so, unsurprisingly, Moodle users such as 152 mentioned this feature “There are various functions such as viewing schedules and class information.”

Lastly, Google Classroom was preferred over Moodle for its ease of communication with teachers and the availability of mobile-friendly features such as an app. An example of ease of communication is “I prefer Google Classroom because I get instant notifications from teachers and homework assignments. I also like Google Classroom because I can use the comments section to ask questions to the teachers and it is very easy to submit assignments.” (respondent 225). Regarding being mobile-friendly, the Classroom app feature may be particularly important at this institution where iPads running iOS rather than regular operating systems were used, with respondent 266 writing “I can see the comment from teachers and it is more convenient on iPad and smartphone.”

## Discussion

This study sought to identify student preferences regarding the two LMS systems being concurrently used at a private women's university in Japan, Moodle and Google Classroom. This dual-LMS evaluation presented a unique opportunity for comparison and offered richer insights than studies focusing on a single platform.

Results of two surveys indicate that Google Classroom is the overwhelming favorite amongst students, and that this preference increased over time. The fact that students in third and fourth years, who may not have used Google Classroom prior to ERT during the pandemic, were the most likely to prefer Moodle suggests that a great deal of the preference for Moodle may be simply due to familiarity with the platform rather than specific features of the platform.

### Shift Towards Google Classroom

The significant increase in preference for Google Classroom can be attributed to four main factors: user-friendliness, integration with Google Suite, its notification system, and mobile accessibility. Google Classroom's simplicity and intuitive design were frequently cited as reasons for its popularity. Students appreciated the streamlined interface and ease of navigation, which contrasts with Moodle's more complex setup. The platform's user-centric design likely facilitated a smoother transition for students and instructors adapting to remote learning environments.

Furthermore, the seamless integration with Google Drive and other Google applications was a major advantage. This integration allowed for easier document management and assignment submission, which was particularly beneficial during a period of rapid adjustment to online learning. The ability to work within a cohesive ecosystem likely enhanced students' overall experience.

In addition, the effective notification system in Google Classroom played a crucial role in managing assignments and deadlines. Timely reminders and notifications helped students stay organized and on top of their work, contributing to the platform's favorable reception.

Finally, the availability and functionality of Google Classroom's mobile app made it more accessible for students using smartphones and tablets. This flexibility in accessing course materials and managing assignments was a significant advantage in the remote learning context.

### Continued Preference for Moodle

Despite the overall shift towards Google Classroom, some students continued to prefer Moodle mainly due to familiarity with the LMS. For many students, Moodle's long-term use contributed to a sense of comfort and ease. Those who had used Moodle since their early years at the university valued its familiarity, which likely outweighed the perceived benefits of switching to a new platform.

Moreover, Moodle's comprehensive dashboard and organizational tools were appreciated by students who preferred its structure for managing course materials and deadlines. The platform's depth of features may cater to students who value detailed course management capabilities.

Similarly, some students noted that Moodle's specific features, such as detailed tracking and reporting tools, offered advantages in managing assignments and assessing progress, despite the more user-friendly nature of Google Classroom.

### Implications for LMS Selection

The findings suggest that while user-friendly platforms like Google Classroom are increasingly favored, institutions should consider the diverse needs and preferences of their faculty as well as their student populations. The shift towards Google Classroom underscores the importance of a streamlined and integrated LMS experience, particularly in a remote or hybrid learning environment. However, the continued preference for Moodle among some students highlights the need for a robust feature-set, flexibility and the importance of accommodating different user needs.

## Institutional Considerations

For educational institutions, choosing an LMS involves balancing ease of use with the depth of functionality. Moodle is a standalone system that can operate independently. This presents its own challenges in that a member of staff or faculty is required to administer the server and troubleshoot any problems that arise. However, that arguably makes it less of a privacy concern for university administrators and students. Google Classroom is designed to integrate with the larger Google ecosystem, which includes services such as Gmail, Google Drive, Calendar, Maps, and YouTube, which may make stakeholders wary. If the institution already subscribes to Google Suite, this level of integration justifies the adoption of Google Classroom as their primary or sole LMS. Many universities use other services such as Microsoft 365, Blackboard, or use their own in-house-developed LMS. As a result, switching to Google Classroom may not be feasible or practical.

LMS selection also has implications regarding its potential impact on learning outcomes. Google Classroom, with its emphasis on real-time collaboration and direct feedback within Google Docs, fosters enhanced student engagement and deeper learning. Students benefit from immediate access to resources, streamlined workflows, and personalized feedback, which can lead to improved critical thinking, problem-solving, and communication skills. While Moodle offers robust features for course creation and assessment, its interface can sometimes feel less intuitive, potentially hindering student engagement and leading to a less streamlined learning experience. Ultimately, the choice between Google Classroom and Moodle depends on the specific learning objectives and the desired learning environment.

Regardless of the LMS used, institutions should consider providing training and support to ensure that all students and instructors can effectively utilize the tools available. Additionally, institutions might explore hybrid approaches or phased transitions to address the needs of users accustomed to different LMS environments. Ultimately, the question of which LMS to use depends on whether the choice is available. Some institutions are not in the position to switch or choose where others are. The findings of this study show that students will adapt to whatever LMS they are told to use.

## Limitations

This study has several limitations. The sample was drawn from a single institution, which may limit the generalizability of the findings to other educational settings. Additionally, the study relied on self-reported data, which may be subject to response bias. Future research should consider incorporating a broader range of institutions and using mixed-methods approaches to provide a more comprehensive understanding of LMS preferences. Also needed is a detailed comparative analysis of user experiences with these platforms, including longitudinal studies that track changes in individual preferences and usage patterns over extended periods. Additionally, different versions of Moodle used at other institutions may provide a different user experience.

## Conclusion

This study examined student LMS preferences over a two-year period in which both Moodle and Google Classroom were being used at the institution. The results show a very strong preference for Google Classroom over Moodle, particularly for students with less prior exposure to Moodle. The results also showed that the preference for Google Classroom increased over time. An examination of student written comments indicates that the main reasons for preferring a particular LMS were related to the ease of finding information on the platforms as well as the general user-friendliness of the LMS. However, Google Classroom seemed to offer many advantages in terms of ease of logging in, submitting assignments, receiving notifications of due dates, communicating with the instructor, as well as the availability of a mobile app. Meanwhile, Moodle was more likely to be preferred due to simple familiarity with the LMS and the fact that the administration posted important information exclusively on Moodle.

With thoughtful implementation, LMS platforms can break down geographical barriers, making education more accessible to students in remote areas or those with limited mobility. In addition, the development of digital skills and knowledge via the use of such platforms can help prepare students with the tools needed to succeed in the 21st-century workforce. Ultimately, students will be able to adapt to whichever system is chosen, but based on these findings, institutions that are considering switching LMS or are in the position of selecting their primary LMS should consider the student user experience with the LMS in addition to other factors when making their decision.

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