

# Optimizing Feedback in Learning Management Systems to Increase Student Engagement

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Learning management systems (LMS) serve as pivotal educational platforms in higher education, providing various tools that support student learning. However, despite their extensive adoption, LMS often fail to provide effective feedback mechanisms, which are essential for fostering student engagement. Engagement is vital when students receive feedback because it increases their receptiveness and motivation to act on the feedback, leading to deeper learning and skill development rather than just a passive exchange of information. Digital feedback, including written comments and grades, delivered electronically through LMS, plays a crucial role in this regard. Unfortunately, such feedback is frequently overlooked and inadequately addressed by students, which significantly impacts their interaction with learning content. Feedback delivered via LMS may experience delays and lack personalization, richness, and interactivity. These deficiencies highlight a significant issue in how students engage with online feedback. This study conducted a literature review to identify engagement instruments used in learning science and gathered student perceptions on the usefulness of these features. The survey results revealed that the most engaging feedback features include analytics and reports to monitor progress, detailed rubrics and grading scales, and immediate automated feedback using AI. Feedback dialogs with instructors were also rated positively. However, peer-related feedback mechanisms such as peer feedback and comparative feedback were less preferred. The findings suggest that personalized, data-driven feedback, clear assessment criteria, and interactive text-based discussions are highly valued by students and can significantly enhance student engagement. Implementing these features in LMS can lead to improved feedback dynamics and enhance student engagement.

Additional Key Words and Phrases: Learning Management Systems, Feedback, Student, Engagement

## 1 INTRODUCTION

Student engagement is a widespread challenge in educational institutions. In an effort to engage students, educators and researchers have explored various strategies. As educational methodologies continue to evolve, the integration of technology has become a key area of focus, particularly through platforms that directly interact with students on a daily basis. In our rapidly evolving digital age, Learning Management Systems (LMS) such as Canvas and Blackboard have become the primary platforms for delivering educational content. These platforms incorporate tools like assignments and feedback mechanisms to enhance learning experiences. Despite their critical role, LMS platforms often fail to fully engage students. A significant shortcoming is the effectiveness of their feedback mechanisms. Feedback is a crucial component of educational settings, known for its ability to enhance learning by helping students identify their strengths and weaknesses, thereby fostering deeper understanding

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and continuous improvement [34]. Research shows that feedback is only as good as the extent to which it engages its receivers [21]. Various digital tools have been explored to enhance the feedback experience [2] [36]. However, these studies focus on technology in general rather than LMS and studies in the area of student engagement within LMS are predominantly focused on broad engagement strategies rather than delving into the specifics of feedback engagement. The concept of engagement techniques for feedback within LMS has not been explored. For example, a study demonstrates the effective use of LMS features to enhance student engagement through integrated tools like electronic communications and assessments [49], but it doesn't specifically isolate feedback mechanisms as a unique area of focus.

The paper is structured as follows. Section 2 identifies the core issue of ineffective feedback in LMS and its impact on student engagement, leading to the main research questions. Section 3 outlines the approach taken, which is a literature review and surveys to gather data on student perceptions. Section 4 summarizes research on student engagement, engagement instruments, and feedback in LMS. Section 5 describes how the engagement strategies are mapped to LMS feedback features, which are then translated into a survey design to gather student perceptions of these features. Section 6 presents the findings on student engagement with the different feedback features. Section 7 reflects these findings, relates them to the research questions, and notes limitations and future research directions. Finally, section 8 summarizes the key findings, their significance, and recommendations for improving feedback in LMS to enhance student engagement.

## 2 PROBLEM STATEMENT

Despite the widespread adoption of Learning Management Systems, feedback within LMS is frequently overlooked or underutilized by students, leading to superficial engagement with the learning material—a situation often described by students as "check the grade, log out" [55]. One notable issue is that feedback in LMS typically lacks depth, often being too generic due to instructors' time constraints or system limitations [55]. Additionally, the impersonal nature of digital feedback can lessen its impact, as the absence of face-to-face interaction reduces the emotional and motivational effects essential for engaging students [43].

Research shows that the success of feedback depends greatly on how students interact with it, not just on giving the feedback itself [21]. Students often do not engage deeply with feedback due to its presentation and integration within the LMS. Furthermore, there is evidence suggesting that feedback practices within digital platforms fail to support meaningful interactions around feedback, leading to students passively receiving information instead of actively engaging with it, where they can reflect, understand, and act on the feedback provided [21].

This prevalent issue underscores a gap in the delivery and impact of feedback in LMS, suggesting the need for more engaging and effective feedback strategies. Addressing this gap leads to the following research question and sub-questions:

RQ: What type of feedback would be useful in the context of learning management systems to enhance student engagement?

*RSQ 1: What defines effective student engagement in a digital platform such as Canvas?*

*RSQ 2: What engagement instruments are identified in educational research both from a learning process perspective as well as in the context of digital platforms?*

*RSQ 3: What is the perception of feedback features among the end users (such as students) regarding the capability to enhance their engagement within LMS?*

### 3 METHODOLOGY

The first and foremost step of this study was to perform a systematic literature review [35]. The primary goal of this review was to understand what constitutes effective student engagement and to identify various engagement instruments used in educational research both from a learning process perspective and in the context of digital platforms. By examining existing studies, we aimed to uncover strategies and tools that have been proven to enhance student engagement. This foundational knowledge was crucial for identifying effective feedback mechanisms that influence engagement. All strategies are mapped to LMS feedback features, which are then translated into a survey design to explore students' perceptions of these features. Qualitative and quantitative analysis will be used to analyze the survey results [14].

## 4 LITERATURE REVIEW

### 4.1 Literature Search

The primary tool used for related literature was Google Scholar. Each research sub-question was explored using specific keywords to gather relevant literature comprehensively. The main keywords used in the search process included terms related to student engagement, feedback mechanisms, and Learning Management Systems (LMS).

The main keywords used for each research sub-question were:

- *Research Sub-Question 1* Keywords: "student engagement," "digital platforms," "LMS," "effective engagement," "online learning engagement"
- *Research Sub-Question 2* Keywords: "engagement instruments," "learning process," "digital education tools," "student," "educational technology", "feedback features", "engagement through feedback"

The most frequently occurring keywords across the different sub-questions were:

- "engagement"
- "student engagement"
- "digital platforms"
- "feedback mechanisms"
- "learning management systems"
- "online learning"
- "digital feedback"

These keywords helped identify relevant studies and sources that provided insights into the mechanisms of student engagement and the role of feedback in enhancing learning experiences in digital environments. The abstract and keywords of each paper were reviewed to ensure alignment with the research sub-questions and overall thesis topic. Each paper was assessed based on its relevance to the specific research sub-question. Papers that directly addressed aspects of student engagement, feedback mechanisms, or Learning Management Systems were given priority.

### 4.2 Theoretical Background on Student Engagement and the Role of Feedback

In the broader context of student engagement research, there's a significant body of literature that examines general engagement strategies and their impacts. Studies highlight the evolution from focusing merely on reducing disengagement to actively supporting an environment where all students are equipped to succeed academically [37] [25]. These insights are critical for understanding how engagement plays a pivotal role in educational outcomes.

Within the study of student engagement, considerable attention has been given to how feedback can enhance learning. Among the focused research, crucial insights have been given into how feedback mechanisms can be optimized to actively involve students and improve their educational outcomes. It is argued that effective feedback should not only inform students of their performance but also engage them in a manner that promotes self-regulation and deeper learning [34]. This specific aspect of feedback engagement reveals that much of the existing research focuses on the quality of feedback and its alignment with students' expectations and needs [1] [57].

Research has extensively explored the use of digital tools to enhance feedback processes, with studies highlighting how technologies can make feedback more engaging and impactful for students. For instance, various digital technologies have been discussed that simplify the feedback process, improving its efficiency, especially in larger educational settings [2]. Similarly, the use of multimedia tools like video feedback has been explored, which provides a more dynamic and interactive way for students to receive and engage with feedback [36]. These studies underscore the potential of digital tools to significantly enhance the feedback experience.

Research in the area of student engagement within LMS has predominantly focused on broad engagement strategies rather than delving into the specifics of feedback engagement. The general trend in LMS research tends to focus on broad instructional techniques and integration of technology.

### 4.3 Effective Student Engagement

Defining effective student engagement has been challenging [38]. Some research describes it with terms like "passion" and "excitement" [6], while other studies associate it with achievement, a sense of belonging, and positive outcomes [38]. Engagement is often categorized into behavioral, emotional, and cognitive types.

Behavioral engagement focuses on the physical actions students take, such as attendance and participation in class activities, which are observable and measurable [51]. Emotional engagement involves

feelings of interest, enjoyment, and a sense of belonging. Cognitive engagement refers to students' investment in their learning, where they go beyond the requirements and embrace challenges [51].

Student engagement can also be defined as "the quality of effort students themselves devote to educationally purposeful activities that contribute directly to desired outcomes" [23]. Another perspective describes it as "the process whereby institutions and sector bodies make deliberate attempts to involve and empower students in shaping the learning experience."

For the purposes of this study, student engagement will be considered as the activities that follow the feedback provided through the digital platform. Research has shown that students often remain inactive or minimally engaged [55]. One study used software to record whether students had accessed their feedback for more than 30 seconds [48]. This time frame was used as an indicator that a student had looked at the mark but was not allowed enough time to adequately read the feedback. However, the concept of engagement in literature is not clearly defined.

In this study, we will not impose a strict time frame for determining engagement and assume a 100% likelihood that students will fully engage with feedback. Instead, we will focus on the relative closeness to the moment students receive feedback, recognizing that this concept needs further investigation.

These findings helped to answer the first research question by identifying the main concepts of engagement as they are used in current learning science literature. Specifically, they highlight the main components and construct activities involved in the engagement process, which can be made measurable within digital environments. For instance, activities followed after feedback, with time frame approximations.

#### 4.4 Engagement Instruments

In order to start speaking about engagement strategies, first we have to mention all possible interactions in education. A widely accepted framework has been developed that identifies three types of interaction: learner-learner, learner-instructor, and learner-content interactions [32]. Many studies look into the different engagement types for each interaction. A study conducted a survey to investigate the perceptions of strategies that foster student engagement in online learning environments and contrast them with the perceptions of students [8].

For effective learner-learner engagement, the highest-rated strategy was using icebreaker discussions for introductions. This was found to form a supportive and friendly atmosphere in online courses [40]. The second most valued strategy involved communication tools for case studies, reports, and projects. Peer relationships also appear to be important in encouraging student engagement [33] [52]. A study found that students often prefer seeking assistance from peers rather than instructors [7]. To add to this, it was discovered that discussion boards, chat sessions, blogs, and group tasks have served excellent in learner-to-learner engagement [41] [4]. It is highly recommended the use of web-based applications, for example, Twitter feeds, Google applications, and video and audio technology to better engagement online [56]. In a survey, it was discovered that the grades of students mainly consist of discussions, from which

they learned more and felt more satisfied [46]. Therefore, it is recommended that the use of chatting and videoconferencing should be implemented in synchronous activities and discussion boards in asynchronous activities [4]. Synchronous learning is where students and instructors log in from anywhere at the same time, whereas asynchronous can be at any time from anywhere [30].

In the realm of learner-instructor engagement, the top strategy found was the regular sending of emails or posting of announcements, a practice supported by several studies as a means for instructors to engage students [27] [26]. Consistent interaction between students and instructors is emphasized to enhance online student engagement [16] [24]. Instructors should be well-prepared and enthusiastic. The second highest-rated strategies were referring to students by name in discussion forums and providing grading rubrics for all assignments. For example, it is believed that rubrics are valued both by students and instructors [19]. Research has also found that timely and thorough instructor feedback is very beneficial as students can make improvements in their learning process. Techniques for this strategy include mini videos and screencasting [24]. For the collaboration between students and instructors, it is also suggested that well-established technologies are used, such as discussion boards, chat sessions, blogs, Twitter, Skype, Youtube and to form student engagement.

For learner-content engagement, working on realistic scenarios such as case studies, reports, research papers, and presentations was rated highest. Through the real-world examples, the authenticity of the course is being shown [9]. Structured discussions with guiding questions were the second most favored strategy, aimed at deepening student understanding. Guided discussions by the instructor have the power to deepen the knowledge and understanding of students [20].

Moreover, research shows that collaborative group tasks are designed to promote student interaction with their peers, fostering engaged learning and being recognized by students as a valuable educational tool [28].

In terms of feedback engagement strategies, it is claimed that the most valuable one is timely providing consistent feedback to online students and making sure that they are engaged [12]. In order a feedback to be effective in engaging students it needs to be on time, with actionable information/guidelines on how students can improve. It is recommended that an analytics tool is used to identify students' needs [56]. It is also suggested that the use of voice comments is implemented to give a "human touch" and increase the interaction between student and instructor. Detailed and individualized feedback has been shown to improve performance [12]. It is proposed that positive feedback works in the form of recognition for well-done work and creates motivation among students [31].

These results contributed to answering the second research question by pinpointing strategies that foster an engaging online learning environment. The text identifies three types of interactions critical for engagement: learner-learner, learner-instructor, and learner-content. Effective strategies for learner-learner engagement include icebreaker discussions, communication tools, and peer support. For learner-instructor engagement, regular communication, personalized interactions, and timely feedback are crucial. In learner-content

engagement, realistic scenarios and guided discussions enhance understanding. Feedback strategies should be timely and constructive, with tools like analytics and voice comments to increase interaction and motivation.

## 5 SURVEY DESIGN AND IMPLEMENTATION

We have mapped strategies from the literature review to LMS feedback features that potentially influence student engagement. Here we are presenting the feedback features that have been identified after looking into the engagement instruments. They are the following:

**1. Rubrics and grading scales** To ensure feedback is clear and consistent, using rubrics and grading scales that align with learning goals and assessment standards is highly effective. Providing grading rubrics for assignments has been chosen as the second-highest strategy for enhancing learner-instructor engagement [19]. These tools help students understand the criteria for success, thereby increasing motivation and engagement. They encourage self-regulation and continuous improvement, as students can clearly see where they need to improve. Most LMS platforms feature options to design and attach rubrics and grading scales to various tasks like assignments, quizzes, and discussions [39] [47] [10].

**2. Recording feedback** Another way of engaging students is to receive feedback in the form of a video, audio, or screencasting. Receiving online feedback in audio and video formats was found to be highly preferred by students [42]. What was noticed in research is that a problem of online learning is the lack of physical contact [11] [13]. Video and audio feedback add a personal touch that written comments often lack, fostering a sense of connection between students and instructors. This approach can clarify complex points and convey tone and emphasis, making feedback more engaging and easier to understand. Another benefit of using video technology is that the file can be stored and replayed anytime [42]. For this to be done, LMS should have video recording features to comment on student's work with the option to use also screencasting tools to walk through student assignments, pointing out specific areas for improvements and demonstrating how to solve problems [24] [17] [54].

**3. Peer feedback** Peer feedback involves students reviewing and providing feedback on each other's work. A study showed that students often prefer seeking assistance from peers [7]. This method not only diversifies the feedback students receive but also encourages active learning, critical thinking, and self-reflection. Engaging in peer feedback helps students to learn from each other's strengths and weaknesses. Peer feedback requires students to engage actively with the material and their peers, fostering a deeper understanding of the subject matter. Receiving feedback from multiple peers offers a variety of perspectives, which can be more comprehensive and enriching than feedback from a single instructor. A study found that in order to address the deficiency of social interaction when giving feedback, students expressed a preference for group activities as they highly valued the opportunity to review, give, and receive peer feedback [42]. This method promotes a sense of community and collaboration among students, enhancing their learning experience. Many LMS platforms have features that facilitate peer

review processes. Instructors can set up assignments specifically for peer feedback, where students are randomly assigned or can choose peers' work to review. To reduce bias and encourage honest feedback, some LMS platforms offer anonymous peer review options. [50] [53] [58].

**4. Feedback dialogs** It was found that in the use of digital tools, writing text comments was perceived as problematic as the feedback lacked interactive dialogue with teachers [5]. The method of "feedback dialogs" involves not only providing text-based feedback but also creating opportunities for interactive, real-time discussions between students and instructors. This method enhances the feedback process by allowing students to ask questions, seek clarification, and engage in meaningful conversations about their work and the feedback they receive. A study argued that if feedback continues to be perceived as a one-way flow from instructor to student, the instructor is unlikely to understand the needs or determine if the feedback is comprehended. Therefore, it concluded that dialogs provided online are more likely to achieve student engagement [48]. Structured discussions with guiding questions are favored for deepening understanding [20]. Students can ask questions and get immediate answers, ensuring they fully understand the feedback and how to apply it. Interactive discussions make the feedback process more dynamic and engaging, as students are actively involved in the conversation. Real-time interactions allow for more personalized feedback, tailored to the specific needs and questions of each student. Instructors can use LMS comment threads attached to assignments where students can post questions and engage in back-and-forth discussions about the feedback. Another way of doing it is by live chats, which enable students to have real-time text with instructors about their feedback. A study found that chat sessions foster engagement among students and are favored over discussion boards because they eliminate communication delays [41].

**5. Analytics and reports** Utilizing analytics and reports is a powerful method to provide timely and specific feedback by monitoring student progress, performance, and engagement. Leveraging LMS tools or external applications, instructors can gather comprehensive data on student activity, participation, completion rates, grades, and feedback. The use of learning dashboards plays a crucial role in visualizing students' affective states and performance metrics [44]. These dashboards and data visualization tools allow instructors to track and display performance trends, identify patterns, and detect outliers. This data-driven approach facilitates the generation of detailed, personalized reports for each student, highlighting their achievements, challenges, and areas for improvement. Instructors can provide actionable feedback based on these insights, offering clear guidance on enhancing the learning process. For example, if analytics reveal that a student consistently scores low on quizzes related to a particular topic, the instructor can provide targeted feedback and additional resources focused on that area. Significant improvements can also be recognized and encouraged through personalized reports. By integrating analytics and reporting into the feedback process, instructors can offer more effective, timely, and personalized feedback, ultimately enhancing student engagement and learning outcomes. This approach not only supports student

self-awareness but also fosters a culture of continuous learning and development.

**6. Immediate automated feedback** Automated personalized feedback utilizes advanced AI within the LMS to quickly analyze student work and provide tailored responses. When a student submits an assignment, the AI evaluates it against the instructor's criteria, identifying common mistakes, assessing quality, and highlighting strengths and areas for improvement. The tool offers suggestions, points out errors, and provides additional resources specific to each student's needs, delivering immediate and practical feedback. This instant feedback helps students understand their mistakes, learn more effectively, and remain engaged in their studies. Timeliness is a crucial quality of feedback [22]. Quick, detailed feedback allows students to correct errors immediately, preventing misconceptions and ensuring a solid grasp of the concepts. By offering specific guidance tailored to each student, this feedback fosters a sense of support and connection to the learning process, encouraging active participation and sustained engagement [3].

**7. Comparative feedback** It was found that in an online environment feedback should be more inclusive which in addition to traditional feedback will also inform users about their peers' performance [42]. This is a method of evaluation called "comparative feedback", where an individual's performance is assessed in relation to the performance of their peers. This type of feedback provides learners with contextual information about their achievements, such as how their work ranks relative to the class average or the amount of time they have spent on content and assignments compared to others. By offering a comparative perspective, learners can gain insights into their strengths and areas for improvement, making the feedback more engaging and informative. In a study conducted during the lockdown on online education, the highest preferences were shown for performance-oriented comparative feedback that not only highlights students' own performance but also provides insights into their peers' performance and experiences [42]. For instance, within a Learning Management System (LMS), comparative feedback might inform a student that they have scored higher or lower than the class average or that they have dedicated more or less time to certain tasks, thereby encouraging self-reflection and motivating them to enhance their performance

**8. Group feedback** Group feedback serves as a collaborative evaluation method where team members assess each other's contributions toward a common goal. This feedback mechanism underscores the significance of teamwork and mutual accountability, as it allows members to provide insights into how each individual's efforts influence the group's overall progress. Receiving feedback from peers helps individuals identify their strengths and areas needing improvement within the team context. This approach not only fosters self-awareness but also encourages a culture of open communication and constructive criticism. As already mentioned, a study showed that students often prefer seeking assistance from peers [7]. To enhance this process, learning dashboards can be utilized to provide group-oriented monitoring feedback. Group standards can be used to offer anonymous evaluations of each member's performance against expected standards for shared tasks [45]. This kind of dashboard feedback allows participants to detect areas where their performance may need improvement with respect to group

expectations, thus promoting continuous learning and development. Ultimately, effective group feedback, supported by learning analytics, enhances the team's overall performance by ensuring that all members are aligned and working towards shared objectives [29].

These features have been formulated into survey questions: These features have been formulated into survey questions:

- **Rubrics and Grading Scales:** How engaging do you think it would be for you if the feedback provided through an LMS includes detailed rubrics and grading scales?

- **Video or Audio Feedback:** How engaging would it be for you if the feedback given through an LMS is in a video/audio recording format?

- **Peer Feedback:** Would it be engaging for you if the LMS offers feedback provided by your peers?

- **Feedback Dialogs:** Would it be engaging for you if the feedback provided through LMS includes interactive text-based discussions with your instructor?

- **Analytics and Reports:** Would it be engaging for you if the LMS offers feedback that uses analytics and reports to monitor your progress/performance towards specified learning goals with suggestions on how to improve (targeting behavior/process aspects)?

- **Immediate Automated Feedback:** Would it be engaging for you if the feedback provided through LMS uses AI to immediately analyze your work, highlight mistakes, and provide personalized suggestions for improvement (targeting cognitive aspects, e.g. understanding/reflection of a task/problem, solution)?

- **Comparative Feedback:** Would it be engaging for you to receive feedback through the LMS that compares your work to the performance of your peers (e.g., compared to the average of your class, you perform lower/higher, spent less/more time with the content/resources/assignments, etc.)?

- **Group Feedback:** Would it be engaging for you if the LMS offers feedback from your team members on your contribution to achieving the group's goals?

## 5.1 Research Design

The survey aims to determine which feedback features students find most engaging in their use of LMS. It was implemented using Google Forms and was distributed through institutional networks where participation was voluntary and anonymous. The survey consisted of 13 questions: 4 demographic questions, 8 Likert scale questions about different feedback features, and one open-ended question. The first 4 demographic questions aimed to collect data such as the participant's age, gender, current level of education, and experience with using LMS. The next 8 questions were the above presented one for each feedback feature. The Likert scale ranged from "Very Engaging" to "Not Engaging at All". The open-ended question was included to capture any additional feedback features the participants would like to see implemented in LMS.

## 6 SURVEY RESULTS

The primary objective of the survey was to address the third research sub-question by identifying which feedback features students find most engaging. A total of 73 students responded to the survey.

### 6.1 Demographic Profile

The survey data predominantly reflects the perspectives of young adults, with a significant 94.5% of respondents aged between 18-24 years. This indicates that the survey primarily captured the opinions of traditional college-age students. A smaller proportion of participants, 4.11%, fall within the 25-34 age bracket, while only 1.37% of respondents are under the age of 18.

The gender distribution among respondents shows a relatively balanced representation, with female participants making up 54.8% and male participants comprising 45.2% of the total. This slight predominance of female respondents provides a comprehensive understanding of both male and female perspectives regarding LMS.

In terms of educational background, the majority of respondents are undergraduates, accounting for 71.2% of the sample. This is followed by high school students, who represent 19.2% of the participants. Graduate students pursuing master's degrees constitute 8.2% of the respondents, while those pursuing doctoral degrees make up a small fraction, at 1.4%. This educational distribution aligns with the age profile, further confirming that the survey primarily represents the views of college students.

Regarding LMS experience, the majority of respondents, 53.4%, rate themselves as having intermediate proficiency. Advanced users make up 24.66% of the sample, while beginners account for 20.5%. This distribution suggests that most participants are familiar with LMS, although they may not necessarily be expert users.

### 6.2 Engagement Scores for LMS Features

The main goal of the survey was to evaluate the perceived engagement levels of the feedback features. Visualizations of the findings can be seen in Figure 1. The findings reveal that the use of analytics and reports to monitor progress and provide suggestions for improvement is the most engaging feature, with 77.8% of respondents finding it very engaging or engaging. This indicates that students highly value personalized feedback and guidance based on their performance data.

Following closely, 74.0% of respondents indicated that detailed rubrics and grading scales are very engaging or engaging. This suggests that clear expectations and transparent assessment criteria are highly appreciated by students.

Immediate automated feedback, which includes analyzing work, highlighting mistakes, and providing personalized suggestions for improvement, was found to be very engaging or engaging by 71.3% of respondents. This underscores the importance of immediate and tailored feedback in the learning process.

Feedback dialogs with instructors were also rated positively, with 66.2% of respondents finding this feature very engaging or engaging, indicating a preference for direct and meaningful interaction with educators. Feedback delivered in video or audio recording format was moderately engaging, with a percentage of 54.1%, reflecting a favorable response to dynamic feedback methods.

Features related to peer interactions received lower engagement scores. Feedback from team members on individual contributions to group goals had a percentage of 52%, while peer feedback and comparative feedback both around 50% of responders marked it as

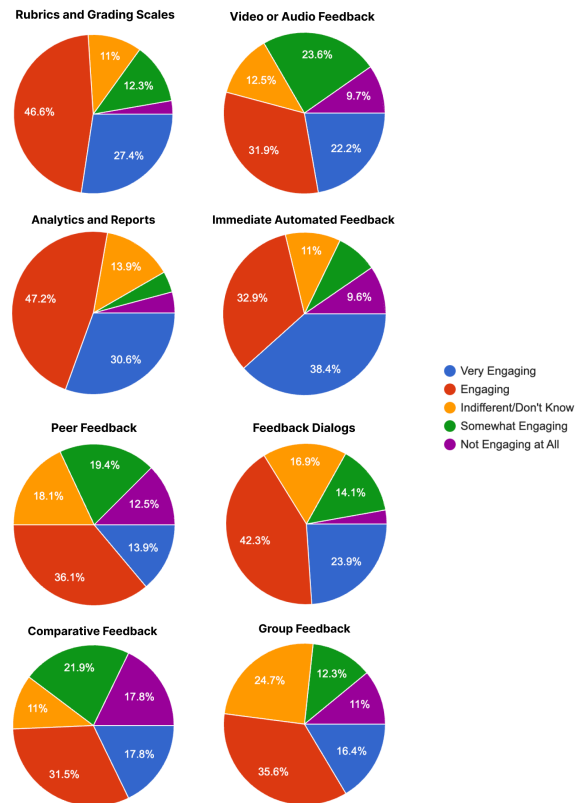


Fig. 1. Engagement Levels among Feedback Features

engaging or very engaging. These findings suggest that while peer-related feedback mechanisms are somewhat engaging, they are less preferred compared to personalized and instructor-led feedback.

In response to the open-ended question, several students expressed a need for real-time feedback from teachers, highlighting preferences for "1:1 Feedback Sessions" and "In-person" feedback. Additionally, some students emphasized the importance of feedback that clearly points to specific sections of their work, as illustrated by comments such as "On Blackboard the comment section in the documents is extremely useful highlighting the exact spots for which the feedback is implemented" and "A way to specify which part the feedback is for". Another common suggestion was to consolidate all feedback in one place, addressing concerns that feedback is currently scattered across different sections like "Grades" and "Assignments" in some LMS platforms.

## 7 DISCUSSION

The survey primarily represents the views of undergraduate students aged 18-24, with a balanced gender distribution. Most respondents have intermediate to advanced experience with learning management systems, suggesting that their feedback is based on substantial interaction with these platforms.

The findings indicate that features providing personalized, data-driven feedback and clear assessment criteria are perceived as the most engaging. Students particularly value LMS tools that offer analytics-based progress monitoring and tailored suggestions for improvement. Interactive elements such as text-based discussions with instructors and video/audio feedback formats show moderate levels of engagement. In contrast, peer-related features, including peer feedback and comparative feedback, generally scored lower on the engagement scale.

The open-ended question responses reveal a strong student preference for real-time, personalized feedback from teachers, specific feedback that targets and highlights individual sections of their work, and a centralized system for storing all feedback. These insights highlight the importance of clarity, specificity, and accessibility in feedback within learning management systems.

The results of this study are consistent with previous research. Studies have shown that personalized feedback, which includes detailed rubrics and grading scales, can significantly enhance student motivation and engagement by providing clear expectations and standards for success [19]. Moreover, in current LMS environments, students often lack immediate feedback on their work, which is crucial for identifying areas needing improvement [18]. Consequently, they favored immediate personalized feedback facilitated by AI, underscoring the alignment with existing studies that emphasize the importance of timely feedback [56].

There are several limitations to this study that should be considered. First, the survey sample is predominantly composed of undergraduate students aged 18-24, which may limit the generalizability of the results to other student populations, such as graduate students or older adult learners. "Second, the survey is based on participants' own reports, which can be influenced by biases like wanting to appear more favorable (social desirability) or not accurately remembering past events (recall bias) [15] [23]. Third, the study does not consider the design of feedback features in different LMS platforms, which might have a significant impact on student engagement. Additionally, while the survey provides valuable insights into student preferences, it does not measure the actual effectiveness of the feedback features in improving learning outcomes.

Future research should aim to validate these findings through experimental studies that assess the impact of various feedback features on student performance and engagement over time. Studies could also explore the preferences of different student populations, such as graduate students or adult learners, to gain a more comprehensive understanding of feedback needs across diverse groups. Additionally, research should investigate the specific functionalities and design elements of different LMS platforms to determine how these factors influence student engagement with feedback. By addressing these areas, further studies can provide deeper insights into optimizing feedback mechanisms in LMS to enhance student engagement and learning outcomes.

## 8 CONCLUSION

The primary objective of this study was to determine which feedback features within LMS are most effective in enhancing student engagement. The survey results indicate that personalized, data-driven

feedback, clear assessment criteria, and interactive text-based dialogs with instructors are highly valued by students. Specifically, features such as analytics-based progress monitoring, detailed rubrics and grading scales, AI-powered immediate feedback, and feedback dialogs were identified as the most engaging.

Reflecting on the research process, this began by exploring the foundational aspects of student engagement through a literature review. This phase was aimed at identifying the key characteristics that define effective engagement in educational settings. Building on the foundational knowledge, the next phase was specifically aimed at identifying the various engagement instruments that have been highlighted in educational research. This involves a detailed examination of existing studies to determine which tools and strategies have been effective in engaging students. The goal was to develop a comprehensive understanding of the tools available to educators to effectively engage students, thereby broadening the scope of potential instruments to be considered for adaptation in LMS settings. The next step was to identify feedback features and gather students' perceptions regarding their potential to enhance engagement. The survey captured the views of undergraduate students, predominantly aged 18-24, with intermediate to advanced experience in using LMS. While the study provided valuable insights, it was limited by its reliance on self-reported data and the lack of consideration for the specific design elements of different LMS platforms.

In conclusion, this research underscores the critical role of effective feedback mechanisms in fostering student engagement within LMS. By implementing the recommended features, educational institutions can create more engaging and supportive learning environments that promote deeper understanding and continuous improvement among students.

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