Lessons Learned from Using Cadmus for Group Assessments in Large Postgraduate Project Management Programs in the UK [1]

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Abstract

This study examines the use of Cadmus, an online assessment platform, for managing group assignments in large postgraduate project management programs in the United Kingdom. Although Cadmus is primarily used for individual assessments, its potential to facilitate collaborative learning in group assignments has yet to be fully explored. By integrating Cadmus within central learning environments such as Blackboard, this research evaluates the platform's effectiveness in tracking student engagement, streamlining feedback, and supporting collaborative learning through a group essay project. Feedback from students and instructors, both qualitative and quantitative, reveals the platform's benefits and challenges, providing insights into its role in enhancing communication, assignment management, and academic integrity. The findings offer practical recommendations for improving assessment strategies and optimising group assignment experiences, benefiting educators and developers focused on collaborative learning tools.

1. Introduction

Group assignments are a cornerstone of higher education, designed to foster collaboration, critical thinking, and essential teamwork skills that prepare students for professional environments (e.g. Johnson & Johnson, 2009; Sweet & Michaelsen, 2012). The effectiveness of these assignments, however, often depends on the tools used to manage group dynamics, streamline communication, and ensure fair assessment. In recent years, digital platforms have been increasingly adopted to facilitate collaborative learning, but the effectiveness of these tools in supporting diverse learning outcomes can vary significantly (e.g. Hrastinski, 2008; Martin & Bolliger, 2018).

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Cadmus, a digital learning platform primarily designed for individual assessments, has garnered attention for its potential to enhance group-based assignments, particularly in large cohorts which tracking contributions and providing timely feedback is challenging. Despite this, research on using Cadmus in group contexts remains limited (Selwyn, 2011; Li & Baker, 2018). By integrating Cadmus within central learning environments (CLEs) or virtual learning environments (VLEs) such as Blackboard, this study investigates how the platform supports group assignments through structured workflows, engagement analytics, and feedback tools.

Through a systematic analysis of both student and instructor feedback, this research examines Cadmus's impact on collaborative learning and student engagement in large postgraduate project management programs. This study aims to provide insights into the platform's strengths and limitations in group settings and to offer practical recommendations for educators seeking to enhance collaborative learning and improve group assessment strategies (e.g. Burch, 2020; Wong & Li, 2020). The findings contribute to an evolving understanding of digital tools in higher education and underscore critical factors for the successful integration of technology in collaborative assessments.

2. Implementing Cadmus for Group Assessment

This study is organised into four distinct phases for managing student assignments on the Cadmus platform, covering the entire process from initial setup to feedback delivery and survey distribution. This structured approach aims to improve the efficiency and effectiveness of handling educational assignments by integrating online platforms and feedback mechanisms. Developed through extensive discussions with experts in the field, this implementation process ensures a robust design aligned with current best practices. By incorporating expert insights, the study provides valuable lessons on using Cadmus for group assignments. Figure 1 presents a flowchart that illustrates each phase's significance in enhancing student engagement and learning outcomes.

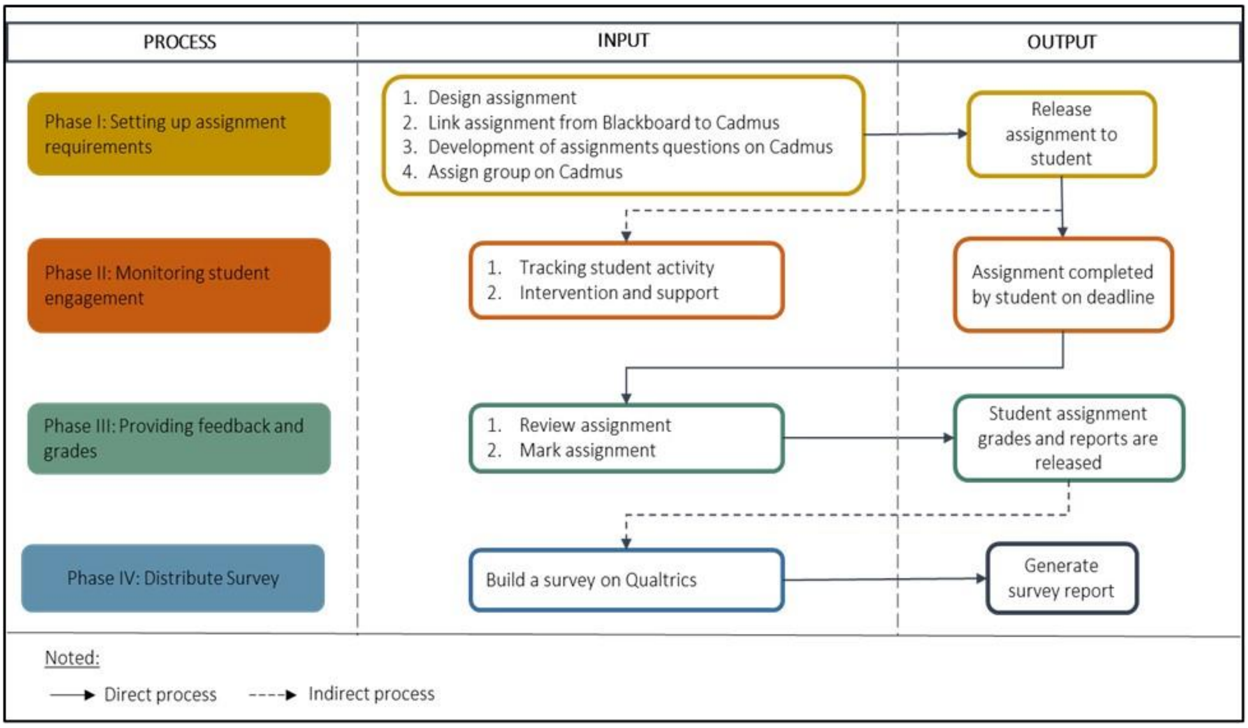

Figure 1: Flowchart process of developing group assessment on Cadmus platform

2.1. Phase I: Setting up Assessment Requirements

To ensure a smooth process, the assessment was carefully set up within the Cadmus platform at the beginning. This phase involves four critical steps: designing the assessment content information, linking it to Cadmus, creating the related assessment questions on Cadmus, and assigning students to groups. Once all these steps have been completed, the assessment was released to students.

2.1.1. Design the Assessment

The design process defines objectives, structure, and evaluation criteria, aligning course elements and ensuring efficient assessment completion. The assessment focuses on identifying key factors influencing emissions and analysing data patterns (Vinco, 2020). Through a group essay project, this paper examines Cadmus's effectiveness in managing group assessments, emphasising collaboration between students and instructors to enhance engagement (Dixson, 2010; King, 2014).

2.1.2. Link the Assignment from Blackboard to Cadmus

After designing the assessment in Cadmus, the next step involved setting it up through Blackboard CLE, which is integrated with Cadmus as shown in Figure 2. This process began by

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creating a Cadmus link on Blackboard by enabling "Edit" mode and navigating to the appropriate content area, typically the Assessment section. From the Assessment or Build Content dropdown menu, the Cadmus Assignment option was selected. If the Cadmus Assignment is not initially visible, it may need to be enabled within Blackboard to proceed.

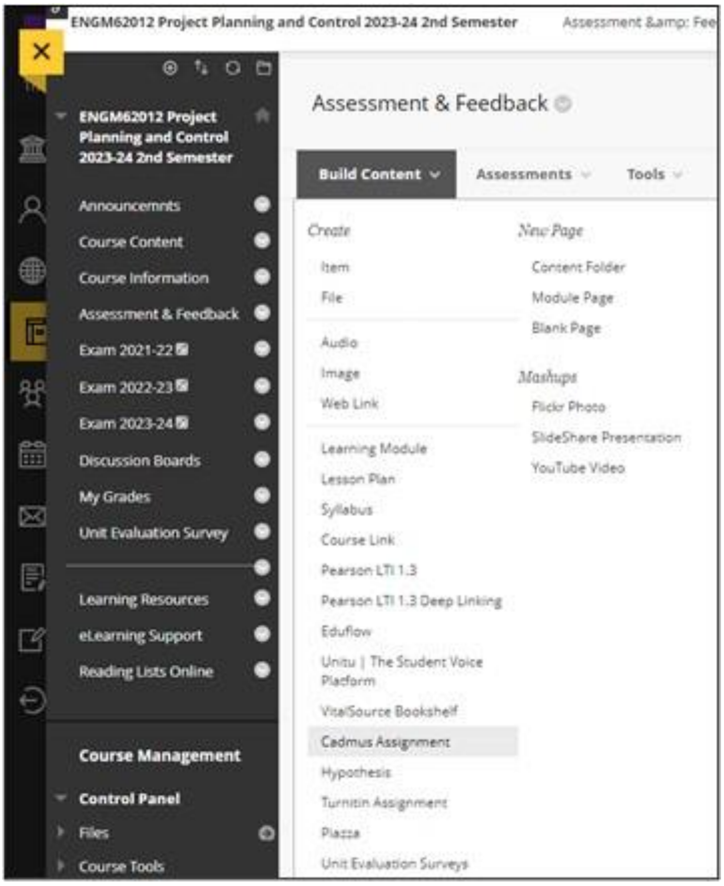

Figure 2: Cadmus option on Blackboard

The assessment was named "Data Analytics," with its due date set later in Cadmus. Evaluation was enabled for automatic grade transfer, with specific points possible, and immediate grade visibility disabled. Access settings and submission configurations were finalised in the options section, establishing the Cadmus link for access to the Cadmus Teacher Environment, enabling further assessment management. Figure 3 shows the data analytics assignment section linking to Cadmus, enabling teachers to set assessment requirements.

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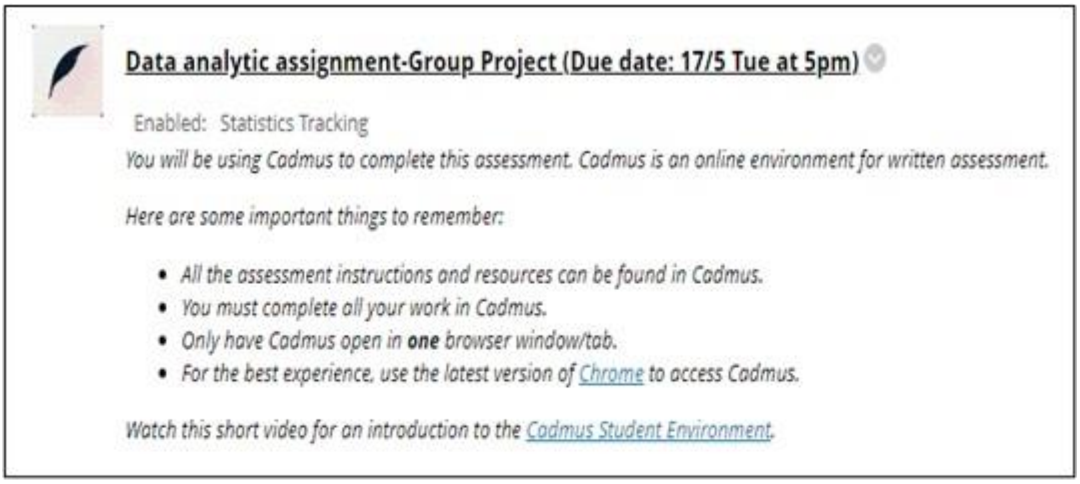


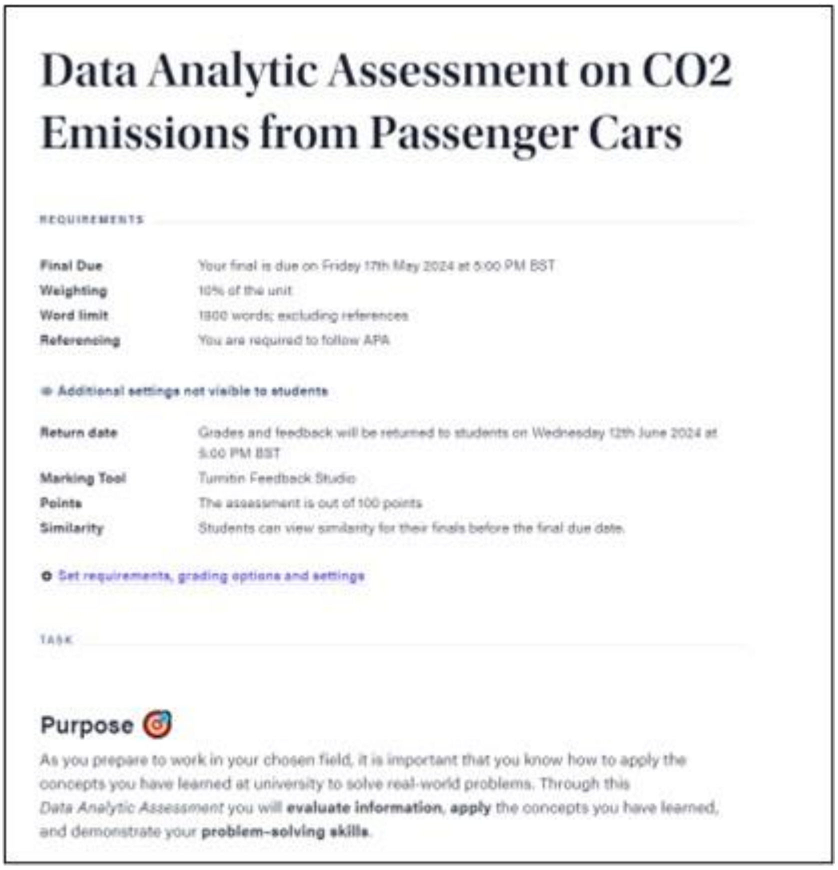
Figure 3: Cadmus links in Blackboard

2.1.3. Development of Assignments Questions in Cadmus

Assignment questions were initially created in Microsoft Word and transferred to Cadmus using Edit mode. Figure 4 displays the Data Analytics assignment requirements within Cadmus's Task section.

Cadmus's formatting toolbar, useful for assignments with graphs and tables, allowed students to format text, insert images, and add screenshots efficiently. Preset formatting options also saved time by automatically adjusting font size, spacing, and page numbers.

Cadmus features a Requirements section specifying word limits and referencing styles, which was used for the Data Analytics assignments. The concise Instructions section clarified tasks, like analysing 2,000 raw data entries from an Excel file shown in Figure 5. Additional details were provided separately in the Resources section to maintain clarity and avoid conflicting information.



Data Analytic Assessment on CO2 Emissions from Passenger Cars

REQUIREMENTS

Final Due	Your final is due on Friday 17th May 2024 at 5:00 PM BST
Weighting	10% of the unit
Word limit	1800 words; excluding references
Referencing	You are required to follow APA

Additional settings not visible to students

Return date	Grades and feedback will be returned to students on Wednesday 12th June 2024 at 5:00 PM BST
Marking Tool	Turnitin Feedback Studio
Points	The assessment is out of 100 points
Similarity	Students can view similarity for their finals before the final due date.

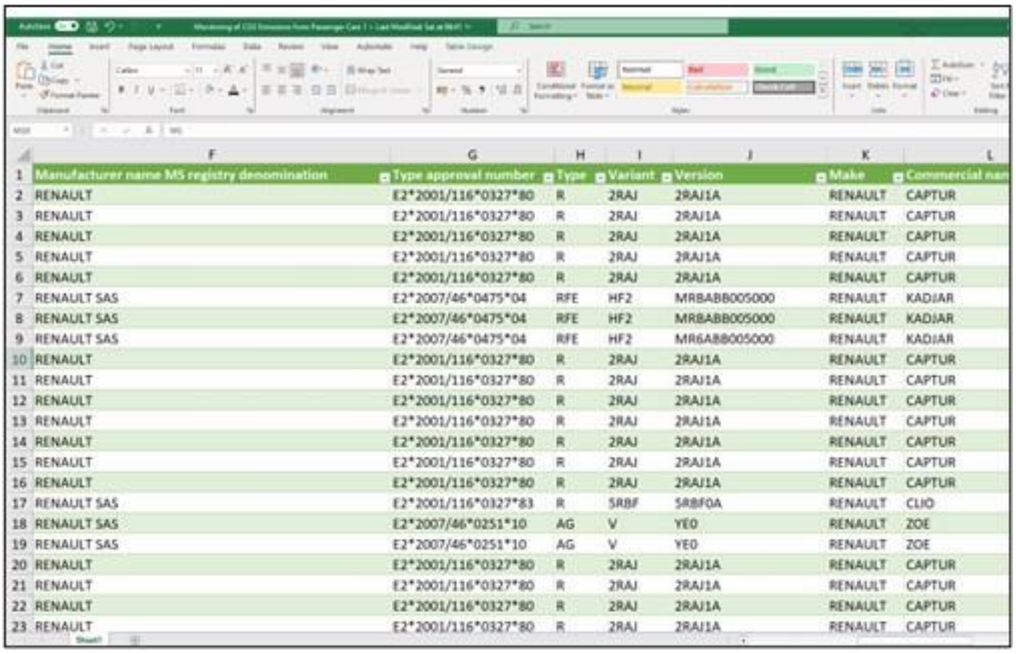
Set requirements, grading options and settings

TASK

Purpose

As you prepare to work in your chosen field, it is important that you know how to apply the concepts you have learned at university to solve real-world problems. Through this *Data Analytic Assessment* you will **evaluate information**, **apply** the concepts you have learned, and demonstrate your **problem-solving skills**.

Figure 4: Data Analytic assignment instructions in Cadmus



	F	G	H	I	J	K	L
1	Manufacturer name MS registry denomination	Type approval number	Type	Variant	Version	Make	Commercial nam
2	RENAULT	E2*2001/116*0327*80	R	2RAJ	2RAJ1A	RENAULT	CAPTUR
3	RENAULT	E2*2001/116*0327*80	R	2RAJ	2RAJ1A	RENAULT	CAPTUR
4	RENAULT	E2*2001/116*0327*80	R	2RAJ	2RAJ1A	RENAULT	CAPTUR
5	RENAULT	E2*2001/116*0327*80	R	2RAJ	2RAJ1A	RENAULT	CAPTUR
6	RENAULT	E2*2001/116*0327*80	R	2RAJ	2RAJ1A	RENAULT	CAPTUR
7	RENAULT SAS	E2*2007/46*0475*04	RFE	HF2	MRBABB005000	RENAULT	KADJAR
8	RENAULT SAS	E2*2007/46*0475*04	RFE	HF2	MRBABB005000	RENAULT	KADJAR
9	RENAULT SAS	E2*2007/46*0475*04	RFE	HF2	MR6ABB005000	RENAULT	KADJAR
10	RENAULT	E2*2001/116*0327*80	R	2RAJ	2RAJ1A	RENAULT	CAPTUR
11	RENAULT	E2*2001/116*0327*80	R	2RAJ	2RAJ1A	RENAULT	CAPTUR
12	RENAULT	E2*2001/116*0327*80	R	2RAJ	2RAJ1A	RENAULT	CAPTUR
13	RENAULT	E2*2001/116*0327*80	R	2RAJ	2RAJ1A	RENAULT	CAPTUR
14	RENAULT	E2*2001/116*0327*80	R	2RAJ	2RAJ1A	RENAULT	CAPTUR
15	RENAULT	E2*2001/116*0327*80	R	2RAJ	2RAJ1A	RENAULT	CAPTUR
16	RENAULT	E2*2001/116*0327*80	R	2RAJ	2RAJ1A	RENAULT	CAPTUR
17	RENAULT SAS	E2*2001/116*0327*83	R	5RBF	5RBF0A	RENAULT	CLIO
18	RENAULT SAS	E2*2007/46*0251*10	AG	V	YEO	RENAULT	ZOE
19	RENAULT SAS	E2*2007/46*0251*10	AG	V	YEO	RENAULT	ZOE
20	RENAULT	E2*2001/116*0327*80	R	2RAJ	2RAJ1A	RENAULT	CAPTUR
21	RENAULT	E2*2001/116*0327*80	R	2RAJ	2RAJ1A	RENAULT	CAPTUR
22	RENAULT	E2*2001/116*0327*80	R	2RAJ	2RAJ1A	RENAULT	CAPTUR
23	RENAULT	E2*2001/116*0327*80	R	2RAJ	2RAJ1A	RENAULT	CAPTUR

Figure 5: 2000 raw datasets in the Excel file (Sources from Vinco, 2020)

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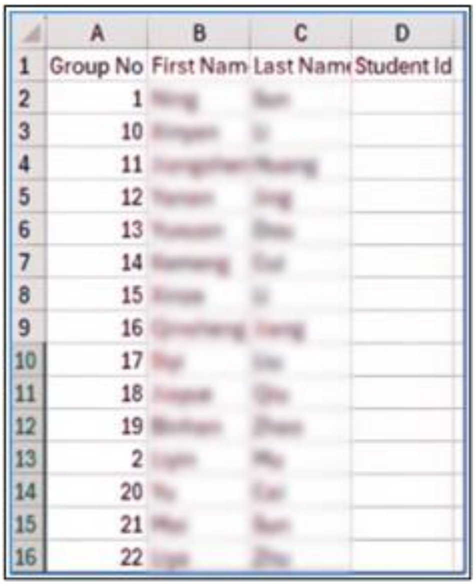
2.1.4. Create Groups on Cadmus.

To organise group assignments, an Excel file of 435 students was downloaded from Blackboard and manually arranged into 87 groups of five. It is recommended to sync the Cadmus class list with Blackboard beforehand to simplify the creation of marking groups, either manually or via an uploaded spreadsheet.

Cadmus lacks a built-in group management feature; however, groups can be created in the "Marking Groups" section. The "Set Up" feature in this section can be used to form 87 groups either from an uploaded spreadsheet or randomly. For this study, pre-arranged groups (from a CSV or ZIP file) were chosen to enhance group diversity and improve student experience. Figure 6 outlines the required information for group assignments, including group number, first and last names, and student ID, ensuring accurate group placements and enhancing the management and evaluation of group assignments.



	A	B	C	D
1	Group No	First Nam	Last Nam	Student Id
2	1	[illegible]	[illegible]	
3	10	[illegible]	[illegible]	
4	11	[illegible]	[illegible]	
5	12	[illegible]	[illegible]	
6	13	[illegible]	[illegible]	
7	14	[illegible]	[illegible]	
8	15	[illegible]	[illegible]	
9	16	[illegible]	[illegible]	
10	17	[illegible]	[illegible]	
11	18	[illegible]	[illegible]	
12	19	[illegible]	[illegible]	
13	2	[illegible]	[illegible]	
14	20	[illegible]	[illegible]	
15	21	[illegible]	[illegible]	
16	22	[illegible]	[illegible]	

Figure 6: The spreadsheet of group allocations

2.2. Phase II: Monitoring Student Engagement with the Group Assignment

Student engagement is a key indicator of student experience and performance in assessments (Kahn, 2014), providing educators with the opportunity to improve their teaching methods to support student growth (Burch, 2020). The second phase involved monitoring student engagement with assignments on the Cadmus platform through three stages, allowing for timely interventions to ensure students effectively understood and utilised the platform, preventing potential failures in meeting assignment expectations.

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2.2.1. Tracking Student Activity

After group assignment submissions, the Integrity Assurance section (Figure 7) allows a review of backend data, including Engagement metrics like Time Spent, Sessions, and Resources Accessed. Each assignment also has a detailed activity report accessible in its row.

Figure 7: Overview of integrity assurance analytics section

The longest time spent on the assignment was 11 hours and 49 minutes, while the shortest was 56 minutes. Two resources were provided, but backend data revealed that 27 groups did not access either the dataset or the feedback survey.

Sessions indicate how often users visit the website, with reports detailing each visit's time, duration, browser, system type, and IP address. This data helps optimise marketing campaigns by identifying the number of accesses and referral sources to target the right audience.
The summary page of the Cadmus report features a timeline with four key milestones: **First Access**, indicating when a student opens the assignment; **First Save**, reflecting initial engagement; **Last Save**, marking the final update before submission; and **Last Submission**, revealing when the assignment was submitted. These milestones help track student interaction with their assignments over time.

The identified milestones offer valuable insights into students' work habits. A short interval between First Access and Last Submission may indicate rushing or procrastination, potentially impacting assignment quality. Understanding these patterns enables tailored feedback, helping procrastinators develop time management strategies while reinforcing positive study habits for engaged students. This timeline ultimately guides students in evaluating their performance and enhancing their study practices.

The group assignment involves collaborative work and uploading to Cadmus, resulting in high-pasted words. However, plagiarism concerns arise if sections are copied from online sources. Turnitin's similarity score is crucial for identifying similarities in submissions, alerting instructors to potential plagiarism while providing feedback to help students improve. This score reflects the originality of students' work, indicating their independent thinking and understanding, and

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serves as a quantitative measure of their comprehension and thought processes. Overall, these features support both academic integrity and student development.

2.2.2. Intervention and Support

Research indicates that tracking student engagement can be crucial for predicting course completion and academic performance, enabling educators to identify at-risk students and implement targeted interventions (Li & Baker, 2018). Effective interventions can enhance study performance, productivity, and learning outcomes. Personalised feedback and learning data visualisation have been shown to boost student progress, allowing educators to address specific challenges while helping both students and instructors monitor trends (Wong & Li, 2020). This approach supports real-time adjustments to learning strategies, fostering meaningful, lasting achievements.

For this course, a structured assignment format was applied, making it essential to identify potential challenges students faced. Tracking student activity and collecting feedback during lectures revealed specific concerns, such as questions about document sharing and editing capabilities within Cadmus. It was clarified that only team leaders could access and edit the assignment file, which some students found restrictive, especially if the leader was unavailable. These issues, alongside other student challenges, were documented in the lessons learned section. By analysing this feedback, educators aim to improve future assignments, refining collaboration and support strategies to enhance the overall learning experience and ensure students are adequately supported.

2.3. Phase III: Providing Feedback and Grades

Feedback on the performance of students' work is very useful in assisting the learning of the students. Subsequently, phase 3 is focused on providing feedback and grading group assignments, which are crucial for student learning and assignment success. The Cadmus platform was utilised to streamline these processes through several key strategies:
monitor student engagement through tools like Integrity Assurance Analytics, which tracks students' interactions with the platform, providing tutors with valuable data on how students are progressing with their assignments. The analytics dashboard offers insights into the time spent on tasks, submission patterns, and potential academic integrity issues, such as plagiarism. These insights help instructors identify struggling students and intervene early, creating a more supportive learning environment.

2.3.1. Reviewing Submissions

The grading process begins with a thorough review of student submissions to ensure they meet established criteria and demonstrate strong subject understanding, following these three outlined steps:

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a. **Initial Review:** Ensured all assignment parts were complete, relevant, and aligned with learning objectives.
b. **Detailed Examination:** Assessed understanding, accuracy, application of theory, presentation clarity, structure, and visuals.
c. **Using Cadmus Tools:** Leveraged annotation features for feedback, comparing submissions to identify inconsistencies or plagiarism.

2.3.2. Mark Assignment

Providing timely, relevant feedback is crucial. Cadmus's tools allow prompt, constructive feedback on student performance, highlighting strengths and areas for improvement with specific, actionable comments. Annotation features enable precise, contextual notes on submissions, streamlining the feedback process for efficient time and resource management.

Figure 8: Students' assignment in the Cadmus environment

Detailed rubrics were developed and used within Cadmus to standardise assessment criteria and ensure transparency, covering areas like context, writing, and presentation (see Figure 8). Separate rubrics were created for 10, 20, and 30-mark questions, ensuring consistent, fair evaluations across assignments.

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MARKING 10 MARK QUESTIONS

Marks	Criterion	Max	High	Medium	Low	Zero
80%	Context and results	**(8.0)** The concepts are clearly identified and described, with answers being relevant and specific steps explained. The contexts are thorough and insightful, and the results are highly relevant. The results are presented and discussed with proper statistical structures, with no mistakes, and the discussion includes how results fit into the context.	**(6.0)** The concepts are clearly identified and described, with answers being explained in detail. Specific steps and processes are identified and explained, and results are presented and discussed with proper statistical structures, with minor mistakes.	**(4.0)** The concepts have been clearly identified and described, and the relevance of the answers has been explained. Results are presented and well discussed using proper statistical structures.	**(2.0)** The concepts have been clearly identified and described, but the results are not explained and there is no proper statistical structure provided.	**(0.0)** The concepts are not clearly identified and described, and the results are not presented.
10%	Grammar, Writing, Structure and References	**(1.0)** Use of appropriate heading and subheading to guide the reader to understand the sentences clearly. The answers follows a sensible structure with no errors. The references are given in a consistent format with no errors.		**(0.5)** The answers follows a sensible structure with minor errors, but no appriopriate heading and subheading. The references are given in a consistent format with minor errors		**(0.0)** The answers don't follow a sensible structure and no appriopriate heading and subheading. References are poorly given and no consistent format is used.
10%	Data Presentation and visualisation	**(1.0)** Visualisations are easy to view and understand. Visualisations are presented in a clear structure, well-labelled and references are provided where necessary. They are relevant to the results.		**(0.5)** Visualisations are easy to view and understand. Visualisations are presented in a clear structure, not well-labelled and no references are provided where necessary.		**(0.0)** No visualisation was presented.

Figure 9a: Rubric for marking 10-mark questions for data analytics assignment

MARKING 20 MARK QUESTIONS

Marks	Criterion	Max	High	Medium	Low	Zero
80%	Context and results	**(16.0)** The concepts are clearly identified and described, with answers being relevant and specific steps explained. The contexts are thorough and insightful, and the results are highly relevant. The results are presented and discussed with proper statistical structures, with no mistakes, and the discussion includes how results fit into the context.	**(13.0)** The concepts are clearly identified and described, with answers being explained in detail. Specific steps and processes are identified and explained, and results are presented and discussed with proper statistical structures, with minor mistakes.	**(8.0)** The concepts have been clearly identified and described, and the relevance of the answers has been explained. Results are presented and well discussed using proper statistical structures.	**(4.0)** The concepts have been clearly identified and described, but the results are not explained and there is no proper statistical structure provided.	**(0.0)** The concepts are not clearly identified and described, and the results are not presented with proper statistical structure.
10%	Grammar, Writing, Structure and References	**(2.0)** Use of appropriate heading and subheading to guide the reader to understand the sentences clearly. The answers follows a sensible structure with no errors. The references are given in a consistent format with no errors.		**(1.0)** The answers follows a sensible structure with minor errors, but no appriopriate heading and subheading. The references are given in a consistent format with minor errors		**(0.0)** The answers don't follow a sensible structure and no appriopriate heading and subheading. References are poorly given and no consistent format is used.
10%	Data Presentation and visualisation	**(2.0)** Visualisations are easy to view and understand. Visualisations are presented in a clear structure, well-labelled and references are provided where necessary. They are relevant to the results.		**(1.0)** Visualisations are easy to view and understand. Visualisations are presented in a clear structure, not well-labelled and no references are provided where necessary.		**(0.0)** No visualisation was presented.

Figure 9b: Rubric for marking 20-mark questions for data analytics assignment

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MARKING 30 MARK QUESTIONS						
Marks	**Criterion**	**Max**	**High**	**Medium**	**Low**	**Zero**
80%	Context and results	**(24.0)** The concepts are clearly identified and described, with answers being relevant and specific steps explained. The contexts are thorough and insightful, and the results are highly relevant. The results are presented and discussed with proper statistical structures, with no mistakes, and the discussion includes how results fit into the context.	**(18.0)** The concepts are clearly identified and described, with answers being explained in detail. Specific steps and processes are identified and explained, and results are presented and discussed with proper statistical structures, with minor mistakes.	**(12.0)** The concepts have been clearly identified and described, and the relevance of the answers has been explained. Results are presented and well discussed using proper statistical structures.	**(6.0)** The concepts have been clearly identified and described, but the results are not explained and there is no proper statistical structure provided.	**(0.0)** The concepts are not clearly identified and described, and the results are not presented with proper statistical structure.
10%	Grammar, Writing, Structure and References	**(3.0)** Use of appropriate heading and subheading to guide the reader to understand the sentences clearly. The answers follows a sensible structure with no errors. The references are given in a consistent format with no errors.		**(1.5)** The answers follows a sensible structure with minor errors, but no appriopriate heading and subheading. The references are given in a consistent format with minor errors		**(0.0)** The answers don't follow a sensible structure and no appriopriate heading and subheading. References are poorly given and no consistent format is used.
10%	Data Presentation and visualisation	**(3.0)** Visualisations are easy to view and understand. Visualisations are presented in a clear structure, well-labelled and references are provided where necessary. They are relevant to the results.		**(1.5)** Visualisations are easy to view and understand. Visualisations are presented in a clear structure, not well-labelled and no references are provided where necessary.		**(0.0)** No visualisation was presented.

Figure 9c: Rubric for marking 30-mark questions for data analytics assignment

Consistency and fairness are essential in grading, particularly for large cohorts. Using rubrics supports uniform standards across assessors, and Cadmus's grading features allow efficient grade management, syncing directly with Blackboard. A key tool within Cadmus is the structured grading form, developed for systematic evaluation based on a custom rubric. This form evaluates students on three main criteria:

- **Context and Results** assesses clarity, relevance, and correct use of statistical methods, weighing explanations and completeness from maximum to zero.
- **Grammar, Writing Structure, and References** rates sentence clarity, structural accuracy, and referencing consistency.
- **Data Presentation and Visualisation** examines the clarity, relevance, and support provided by visual aids like graphs and tables.

Each criterion offers five grading levels, ensuring transparent assessments via specific benchmarks (see Figure 9 a-c). Cadmus's grading form integrates these criteria seamlessly, promoting thorough, fair evaluations.

Additionally, Cadmus's analytics feature identifies common performance trends, informing feedback and teaching strategies. Data on time spent and a similarity index provide insights into student engagement and effort. Grades are calculated automatically once entered, and feedback is provided through Cadmus's inline comments and rubrics, ensuring quality. Assessors are trained to use these tools, maintaining feedback standards. Cadmus's Blackboard integration also

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enhances grade recording and keeps students updated on their progress, ensuring transparency and efficiency in grading and feedback processes.

2.4. Phase IV: Distribute Survey

2.4.1. Methodology

This study assessed Cadmus's effectiveness in managing group assignments through an essay-based group project. A survey approach was selected for its efficiency in collecting standardised, subjective feedback (Fowler, 2014; Dillman et al., 2014), which is ideal for evaluating tools like Cadmus. By ensuring participant anonymity (Donnelly & Patrinos, 2022), the survey provided both quantitative and qualitative insights on engagement, collaboration, marking, and student feedback, offering a thorough evaluation of Cadmus's strengths and limitations in group assignments (Bryman, 2016).

The survey received responses from 99 postgraduate students in the Project Planning and Control course at a Russell Group university in the UK, who were the only participants while the survey remained open. Conducted over a month, it included diverse male and female students from various global backgrounds and a range of specialised programs such as project management, commercial project management, engineering project management, and construction project management. This diversity provided a broad perspective on Cadmus's utility, enriching study findings. Students were asked to reflect on their experiences with Cadmus after assignment completion, allowing an authentic assessment of its effectiveness.
Results were analysed to determine Cadmus's role in supporting collaborative assignments, highlighting key benefits and areas for improvement. Insights from this study are valuable for educators and developers focused on improving collaborative learning tools, underscoring Cadmus's potential in supporting group projects.

2.4.2. Data Collection

Data were collected through an online survey sent via email and Blackboard to all students post-assignment submission. The survey, consisting of nine questions, focused on student satisfaction with the Cadmus application. Responses were analysed in Microsoft Excel to gauge overall satisfaction, with completion taking approximately one month.

2.4.3. Survey Instrument

The survey used Likert-type items to assess three types of interactions in an educational context, based on Moore's (1993) framework: student-to-student, student-to-platform, and student-to-content. Students completed a relevant assignment that assessed their understanding of the course, and the survey measured how they engaged with peers (group work, discussions, collaboration) and the platform (feedback, guidance). Created in collaboration with the unit

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coordinator, the survey was carefully refined for reliability and validity and developed on Qualtrics. It included nine questions: four Likert-type (scored from 1 to 5) and five open-ended questions. On average, the survey took participants 10–15 minutes to complete. Distributed via email, it remained open for four weeks and received 99 responses, ensuring anonymity and confidentiality.

2.4.4. Data Analysis

Responses from the survey were collected and processed using Qualtrics, which was used both to distribute the survey and to analyse the data. The survey contained four Likert-type questions, which were analysed quantitatively to determine the degree of agreement and disagreement across different aspects of student interactions and experiences. To summarise the Likert scale data, descriptive statistics such as means, and standard deviations were calculated. To gain deeper insights into participants' experiences, open-ended responses were analysed qualitatively. A combined quantitative and qualitative analysis provided a comprehensive understanding of the data, which allowed researchers to assess both general trends and nuanced perspectives.

3. Findings and Discussions

Quantitative and qualitative data were gathered from students to assess their experience using Cadmus for group assignments. While aiming for one response per group and targeting 87 responses, 99 students responded, though the exact number of groups represented remains unknown. Figure 2 displays the quantitative data and responses to each question.
76 students acknowledged they had easy access to necessary features and resources on the platform. 40 students admitted to encountering some limitations or restrictions that impeded their ability to effectively complete the assignment while 50 students preferred to adopt the platform for group collaboration. Meanwhile, 60 students recommended the platform for future group assignments.

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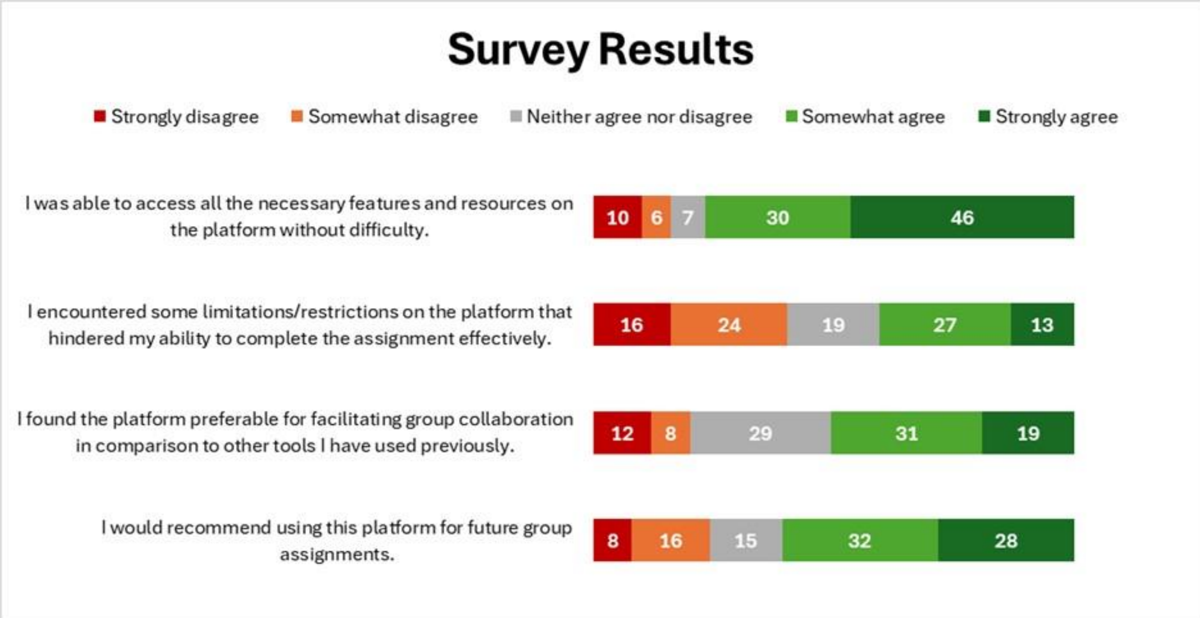

Figure 10: Results of Quantitative Survey

3.1. Results of Qualitative Survey

3.1.1. What were the benefits of completing the group assignment on Cadmus in comparison to other platforms?

Different responses were obtained from the survey which included about 31% of the responses that stated that Cadmus was convenient and easy to use. Additionally, about 10% of the responses stated that there were no benefits in using Cadmus to complete the group assignment while another responded that there was no font adjustment. Other responses that appeared only once included it helped with word count, nice software and no font adjustment. Figure 10 shows the distribution of the responses on the benefits of completing the group assignment on Cadmus obtained from the survey.

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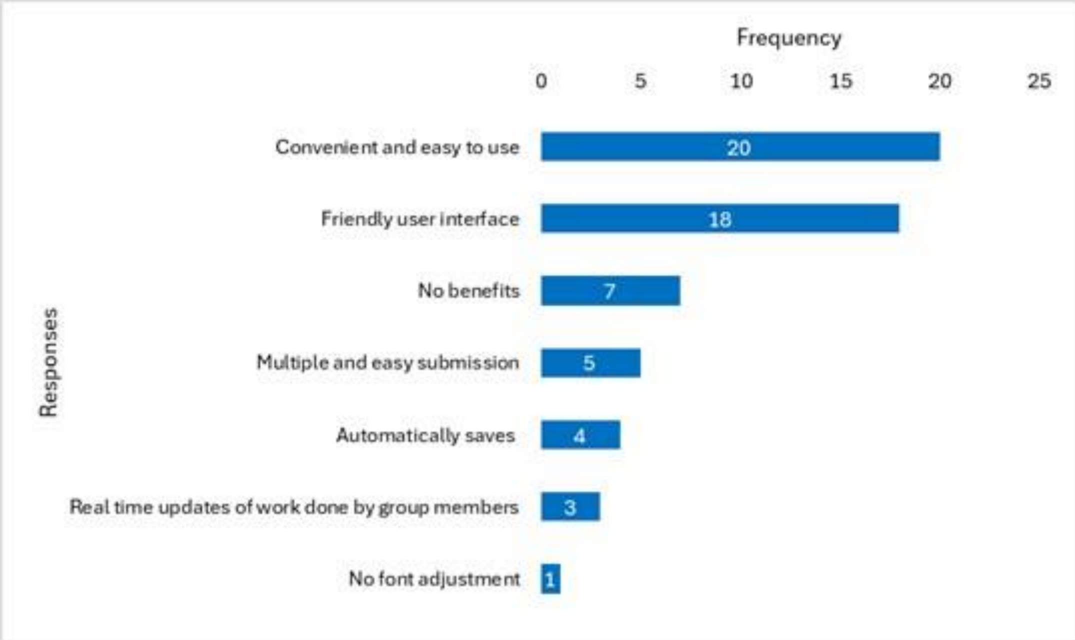

Figure 11: Distribution of the responses on the benefits of completing the group assignment on Cadmus

3.1.2. What specific features of the Cadmus platform did you find most beneficial for completing the group assignment?

The features that the students found beneficial include the word count, multiple submissions, version control, and referencing. Other responses that appeared only once included it was not convenient to start Cadmus on the computer, the flexibility of Cadmus, sending of drafts to teachers, easy submission, upload feature, autosave, and clear instructions. Figure 11 shows the distribution of the responses on the specific features of Cadmus that are most beneficial for completing the group assignment on Cadmus obtained from the survey. Based on Figure 11, referencing is the most beneficial feature of Cadmus as it had the highest number of responses. Meanwhile, automatic save is one of the most beneficial features of Cadmus as it had the second highest number of responses.

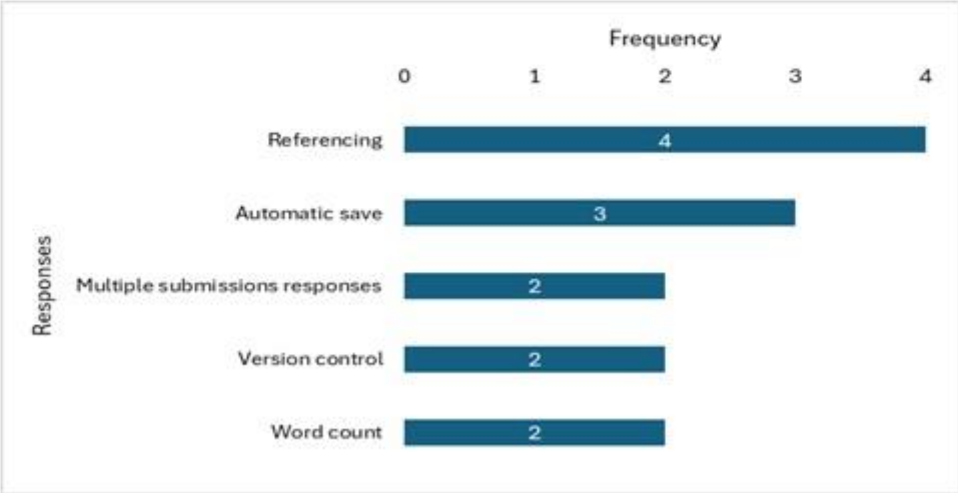

Figure 12: Distribution of the specific features of Cadmus that are most beneficial for completing the group assignment on Cadmus

3.1.3. How did the platform enhance or diminish effective communication and collaboration within your group?

The negative responses included it was impossible to share timely information, it was impossible to collaborate and work on the document in real-time, submission could only be done by an individual, and it was difficult to share documents with other group members. The positive responses include very clear information on assignments. Other responses that appeared only once included that it was not convenient to start Cadmus on the computer. Figure 12 shows the distribution of the responses on how Cadmus enhanced or diminished effective communication and collaboration.

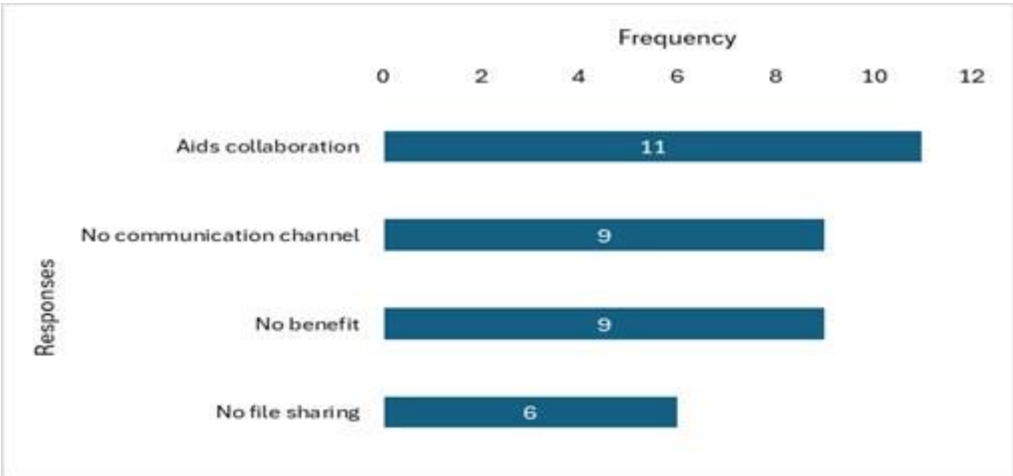

Figure 13: Distribution of the responses on how Cadmus enhanced or diminished effective communication and collaboration

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3.1.4. What challenges did you encounter when using the platform for your group assignment?

Major challenges encountered using the platform include formatting limitations, accessible to only team leader, difficulty in uploading images, hinders collaboration, navigating the interface, inconvenient to use, requires time to grasp and familiarise, and inability to use platform to communicate. Formatting limitations, accessibility to only team leader, and difficulty were most the frequently reported challenges encountered making up about 46% of responses. However, 30% of respondents reported experiencing no challenges using the platform for group assignments. This could mean that Cadmus is suitable for group assignments although 9.5% of respondents reported that the platform hinders collaboration.

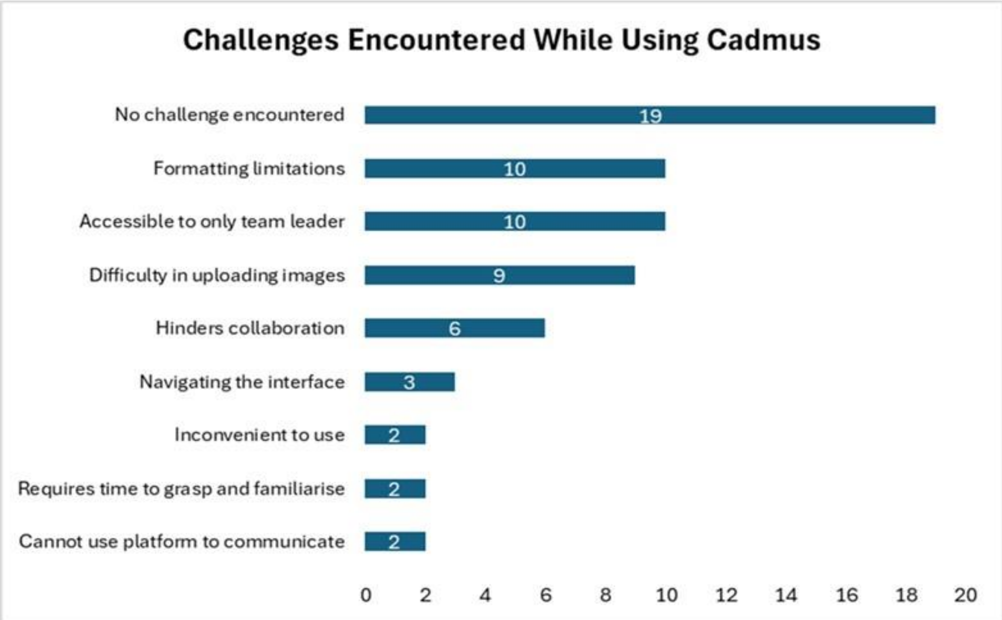

Figure 14: Distribution of the responses on the challenges encountered using Cadmus for group assignment.

3.1.5. Please share your thoughts on how Cadmus can be improved to be support group assignment in the future

Respondents were asked to provide suggestions on how Cadmus could be improved to provide better support for future group assignments. The suggestions provided include enabling sharing of documents, allowing multiple users to edit a document, additional collaboration tools, additional communication features, task assignment and tracking, and provision of additional user support. Document sharing and permission for multiple users to edit a document made up around 80% of the responses because students supposed these would foster collaboration and improve their experience on group assignments.

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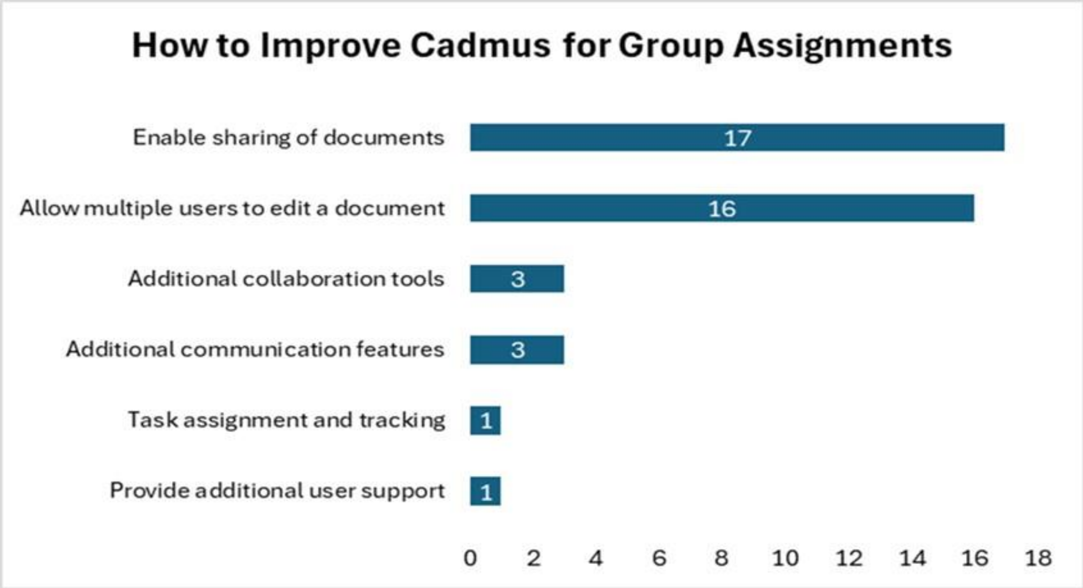

Figure 15: Distribution of the responses on how to improve Cadmus for Group Assignments.

4. Lessons Learned and Recommendations

The survey findings provide a comprehensive view of the benefits and challenges associated with using Cadmus for group assignments. While many students appreciated the platform's convenience, ease of use, and user-friendly interface, several areas for improvement emerged. The following integrated lessons learned and recommendations aim to enhance Cadmus's functionality and better support group assignments in educational contexts.

- **Appreciation for Specific Features: Improve Tool Integration**
  Lesson Learned: Students highlighted features such as the referencing tool and automatic save as particularly beneficial, as these tools contributed to a smoother workflow and minimised disruptions. This demonstrates the importance of integrating tools that simplify specific tasks to enhance the overall user experience.
  Recommendation: Continue to expand and refine built-in tools that support assignment preparation, with a focus on adding features that further simplify complex tasks (e.g., citation management, auto-formatting).

- **Mixed Feedback on Communication and Collaboration: Enhance Communication Tools**
  Lesson Learned: Feedback was mixed regarding Cadmus's impact on communication and collaboration. While some students felt the platform facilitated teamwork, others believed it hindered effective group work due to the lack of a built-in communication channel and file-sharing capability. This underscores the need for integrated tools to support collaborative dynamics.

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Recommendation: Introduce an integrated chat function and file-sharing capabilities within Cadmus to improve coordination and communication amongst group members. These features would enable real-time collaboration and more efficient sharing of documents and resources.

- **Challenges with Access and Editing Limitations: Expand Editing Permissions**
  Lesson Learned: Restricting editing access to team leaders posed a significant challenge for many students. This limitation made it difficult for all members to contribute independently and added pressure on team leaders to manage the assignment.
  Recommendation: Allow multiple users to edit the document simultaneously to support real-time collaboration. This change would offer greater flexibility for students to work at their own convenience and encourage more active participation from all group members.

- **Formatting and Image Upload Difficulties: Streamline Technical Features**
  Lesson Learned: Students encountered issues with formatting and uploading images, often requiring time-consuming manual adjustments. These technical challenges reduced productivity and caused frustration.
  Recommendation: Simplify the image upload process to allow for bulk uploads and automatic resizing. Additionally, expand formatting options to reduce the need for frequent manual adjustments, improving the efficiency of completing group tasks.

- **Varied Perceptions of Team Leader Access: Offer Customisable Access Settings**
  Lesson Learned: Opinions on limiting access to team leaders were mixed; some students found it beneficial for organising tasks, while others felt it hindered group collaboration. This suggests that flexible access settings could better accommodate different group dynamics.
  Recommendation: Provide customisable group access settings, allowing groups to choose whether to restrict editing rights to team leaders or enable shared editing for all members. This flexibility would cater to diverse preferences and enhance the group work experience.

- **Need for Improved Document Sharing: Implement Collaborative Document Sharing**
  Lesson Learned: The absence of a collaborative document-sharing feature hindered the seamless exchange of materials and real-time updates within groups. This limitation impacted the quality of collaboration and overall productivity.
  Recommendation: Enable document sharing within Cadmus to allow students to collaborate more effectively. Shared access to drafts, research materials, and supporting documents would foster a more cohesive group work experience and help maintain progress.

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Conclusion

Cadmus provides valuable benefits for both educators and students in managing and assessing group assignments, particularly in large cohorts. For educators, the platform supports effective student engagement monitoring, though its utility could be enhanced with additional features, such as automated group formation and streamlined grading tools. For students, Cadmus offers a user-friendly experience; however, certain limitations—such as restricted access for non-leader group members and the lack of integrated communication tools—can impede collaboration. Strengthening the platform's communication and collaborative functions, alongside simplifying grade allocation, would increase Cadmus's effectiveness in supporting group work, fostering teamwork, and enhancing the experience for both educators and students.

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Appendix

Cadmus Feedback Survey

Feedback for Cadmus Platform

This survey seeks to obtain feedback on your experience using the Cadmus platform.

Section 1

1.0 Please choose the most suitable response to the statements below.

	Strongly disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)
I was able to access all the necessary features and resources on the platform without difficulty. (1)	○	○	○	○	○
I encountered some limitations/restrictions on the platform that hindered my ability to complete the assignment effectively. (2)	○	○	○	○	○
I found the platform preferable for facilitating group collaboration in comparison to other tools I have used previously. (3)	○	○	○	○	○
I would recommend using this platform for future group assignments. (4)	○	○	○	○	○

Section 2

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1.0 What were the benefits of the completing the group assignment on Cadmus in comparison to other platforms?____

2.0 What specific features of the Cadmus platform did you find most beneficial for completing the group assignment?____

3.0 How did the platform enhance or diminish effective communication and collaboration within your group?____

4.0 What challenges did you encounter when using the platform for your group assignment?

____

5.0 Please share your thoughts on how Cadmus could be improved to better support group assignments in the future. ____

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