Empowering Learning Through Self-Graded Homework in Engineering Mechanics

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Abstract

Engineering mechanics is widely recognized as a "gatekeeper" course across various engineering disciplines. Faculty at Florida Gulf Coast University previously explored multiple instructional strategies in teaching the "Engineering Mechanics: Statics and Dynamics" course, including traditional paper-pencil homework, Pearson Mastering Engineering software, adaptive follow-up modules, McGraw-Hill Connect online homework, ungraded assignments with full solution access, frequent quizzes, daily class assessments, metacognitive exam wrappers, and student attitude surveys addressing study habits, preparation, participation, and engagement. Despite these varied approaches, results indicated minimal impact on overall student academic performance.

In a prior study conducted in fall 2023, the authors introduced self-graded assignments (SGAs) using carefully selected traditional problems. Students graded their own work during review sessions prior to midterm and final exams. While exam scores did not show significant improvement, the SGAs process encouraged deeper reflection. Student feedback revealed that some assigned problems were perceived as overly difficult, with preferences expressed for group-based assignments, hints, partial solutions, or final answers. Additionally, students requested more in-class discussion of the problems. This feedback highlighted both strengths and areas for refinement in the self-graded homework approach.

Modifications to problem difficulty, format, and instructional support were initiated in fall 2024; however, after the first exam covering the 3-D statics equilibrium problems, the study was disrupted due to a temporary hurricane university closure. Adjustments in homework difficulty and format, and support for students have been implemented in the fall 2025 semester.

Preliminary results are presented, based on observation of students' performance (n=233) on exam scores, and a survey of students' perceptions. Across seven semesters taught by the same instructor, the two semesters using SGAs (fall 2024 and fall 2025) achieved higher averages on the 3-D statics exam problem than prior control semesters, with non-parametric tests indicating statistically significant differences in most comparisons. Student surveys show an upward trajectory in perceived learning benefits. However, it is premature to draw conclusions on the effectiveness of SGAs due to several methodological limitations.

Introduction

Homework is a central driver of learning in undergraduate engineering courses because it creates space for deliberate practice, feedback uptake, and consolidation of problem-solving schemas outside of class time [1]. Yet the traditional practice of instructor-graded homework faces well-known challenges: delayed feedback, scalability constraints in large cohorts, and students' growing access to worked solutions that can attenuate productive struggle and obscure misconceptions [1], [2]. Within engineering mechanics (statics, dynamics, and deformable solids), these challenges are consequential because the courses are “bottlenecks” that require transfer of physics and mathematics to multi-step, representation-rich problem solving [3].

“Self-graded homework” (or “self-assessment–based homework”), in which students complete assigned problems and then grade or calibrate their own work against instructor solutions and rubrics—has emerged as a pragmatic, metacognitive intervention intended to (i) deliver immediate, criterion-referenced feedback; (ii) cultivate students’ ability to evaluate the quality of their solutions; and (iii) reduce grading latency without sacrificing formative value [1], [4]–[6]. The theoretical promise aligns with established literatures in *formative assessment* and *self-regulated learning (SRL)*: when students are explicitly guided to plan, monitor, and evaluate their work against clear criteria, achievement improves and metacognitive accuracy can develop [7]–[10]. Recent implementations in engineering education - including within undergraduate mechanics - report feasibility and positive student perceptions, while also surfacing design caveats (e.g., rubric specificity and calibration training) [5], [6], [11].

Notwithstanding its promise, self-grading raises legitimate concerns about *accuracy* (alignment of student-assigned scores with expert judgments), *bias* (systematic over- or under-estimation), and *fairness* in summative use. The empirical picture is nuanced: meta-analyses show that, on average, students slightly overestimate performance, with accuracy moderated by feedback, rubric use, domain knowledge, and prior experience [12]–[14]. In engineering contexts, structured self-assessment with shared rubrics and incentives for alignment can yield reasonable concordance with instructor grading, though variability persists across performance levels [6], [15], [16]. Against this backdrop, the present paper advances the thesis that self-graded homework, carefully designed and calibrated for engineering mechanics, can empower learning by shifting students from passive receipt of points to active engagement with solution quality and error diagnosis.

Experimental Method

Sophomore students in bioengineering, civil engineering and environmental engineering were assigned the task to grade their own work [17] in a required engineering mechanics (statics and dynamics) course. The course is a four-credit course taught in a combined lecture/lab environment with three meetings a week for a total of five contact hours. It is typically taken by engineering students in their second year of study, either fall or spring. The course instruction closely follows the ExCEEd Teaching Model. Since the course is taught in the combined lecture/lab format, there is ample time and opportunity for active, hands-on learning during the class period. Students spend considerable class time working in groups to solve problems under the instructor's supervision. The prerequisites for the course are Calculus I and Physics I, and students are expected to be proficient in these areas. Students must earn a minimum grade of C (73.34%) in the course and at least a 70% exam average to move on to follow-up courses that require engineering mechanics as a prerequisite.

The SGAs were assigned in addition to the McGraw-Hill Connect online homework. This study started in the fall semester 2023 (no 3-D statics SGAs were assigned in the fall 2023) and continued in two subsequent fall semesters (fall 2024 only 3D statics problems are considered due to hurricane interruption after the first exam covering 3D statics problems).

Students scanned and uploaded their assignment on CANVAS (learning management software) before class. At the start of class, the instructor showed the solution to the assigned problem on the projector screen. Students graded their own work based on a scoring rubric set by the instructor for each segment of the solution. Students were encouraged to ask for clarifications regarding the solution and the grading scheme. Most grading was conducted during pre-exam review sessions, ensuring that instructional time for new material was not impacted. Students were subsequently given the opportunity to complete their grading independently after class, allowing them additional time for reflection.

During the fall 2023 study [17], some students found that the problems were too difficult, suggesting that they should be more manageable and preferred them as group assignments. Moreover, they expressed a desire for hints, including partial solutions, final answers to be provided, and the opportunity to go over problems in more detail in class. Overall, the feedback provided insights into the strengths and areas of improvement for the SGAs. As a result, adjustments in homework difficulty and format, and support for students have been implemented in the fall 2024 (3D Statics equilibrium problems) and 2025 semesters. Students were given intermediate and final numerical answers to each problem and were encouraged to collaborate as a group with their classmates. The problems were assigned early, giving enough time to the students to brainstorm together. Also, for one challenging problem, three different submissions were assigned to ensure intermediate answers were corrected as needed.

The following statement was added to the assignment on CANVAS (fall 2024 and 2025) "*Note: The purpose of this assignment is to build on what you learned in class and the online homework. The numerical answers are provided, with the goal for you to retry as needed, figure out any mistake, until you get the correct answer, while consulting with your classmates, the learning assistant, or your instructor. However, the final submission should be your own.*"

These adjustments were made in direct response to student feedback and are reflected in improved satisfaction in 2024–2025.

Figure A of Appendix A shows a 3D equilibrium problem assigned only in fall 2024 and 2025, purposefully selected to cover various aspects of the analysis, including support reactions, forces in cables, and vector manipulation. Students were allowed to grade it during the review class session and/or outside of the classroom, giving them sufficient time to reflect on their work while self-grading.

Students' perception about SGAs throughout the three-fall semesters were assessed by the same anonymous survey, including two Likert scaled questions and three open-ended questions.

Statistical Analysis

The students were divided into two groups: the treatment group and control group. The treatment group (n = 67) was assigned the self-graded 3D equilibrium problems (fall 2024 and 2025). The students in the control group (n = 166) did homework in the traditional way, where they were not asked to grade their work.

Table 1 summarizes the faculty assigned to teaching engineering mechanics across multiple semesters. Only semesters taught by Faculty A are included in the Table, as the statistical comparison aims to maintain consistency in instructional style, assessment practices, and course delivery. Limiting the dataset to a single instructor reduces the risk of bias that could arise from variations across different faculty members, grading practices, or course delivery among multiple instructors

Several semesters were excluded to preserve the validity of the analysis. The Fall 2024 dynamics course was removed because instruction was disrupted by a hurricane. Fall 2023 was also excluded, as SGAs were newly introduced during that term and applied only to the trusses and dynamics modules; no SGAs were implemented for 3D Statics until later semesters after refinement based on student feedback. Additionally, the fall 2017 dynamics exam was omitted from the comparison due to an unusually high number of low-performing outliers that would have disproportionately skewed the results.

Table 1. Faculty assigned to teach engineering mechanics, skipped semesters were not taught by Faculty “A.”

Semester	3D Statics Equilibrium	Dynamics	Comments
Fall 2025	A	A	
Fall 2024	A	A	Dynamics interrupted by hurricane
Fall 2023	A	A	No 3D statics SGAs assigned, therefore fall 2023 is a “Control Group” for 3-D equilibrium. First time SGAs were introduced, needed refinement, improved in subsequent semesters, therefore fall 2023 excluded from being a “Treatment Group”
Spring 2022	A	A	
Spring 2020	A	Online	
Spring 2019	A & B	B	
Fall 2017	A	A	Low-performing outliers in dynamics exam

Figure 1 shows the average in-class exam grade for the static 3D equilibrium problem in seven different semesters. The self-graded 3D equilibrium problem was assigned to the students only in the two recent fall semesters, 2024 (before hurricane’s semester disruption) and 2025. Although the SGAs were introduced in fall 2023, only trusses and dynamics problems were self-graded in fall 2023 (no 3-D statics SGAs were assigned in the fall 2023). These seven semesters were selected for comparison in Fig. 1 because they were the only semesters taught by the same instructor. The result is promising, showing an increase in the fall 2024 and 2025 semesters average grade compared to all other semesters.

Statistical analysis has been conducted using R statistical language [18] at the 5% level of significance. Shapiro test revealed that the data in both the control and treatment group is not normally distributed (non-parametric); therefore, Wilcoxon Rank Sum Test was performed (also known as ‘Mann-Whitney’ test) and the p-values are reported in Table 2. Only semesters taught by the same instructor are listed in Table 2. The Wilcox p-value ($p < 0.5$) indicates that the null hypothesis can be rejected and that there is statistically significant difference between the mean grade of the control and treatment groups, except for the spring 2019 semester ($p > 0.05$).

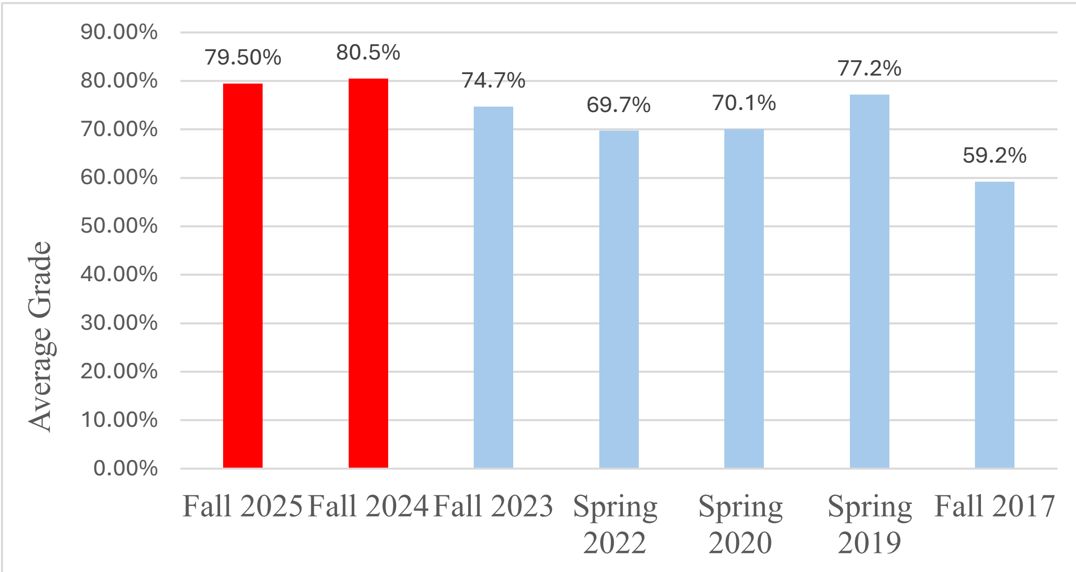

Figure 1 - Average Exam Grade – 3D Equilibrium Problem (Self-Graded 3D Problem introduced only in Fall 2024 and Fall 2025 semesters)

Table 2. 3-D Equilibrium statics exam problem (listed semesters were taught by the same instructor, all other semesters taught by different instructors are not included)

Semester	Group	n	Average Score	Median Score	Wilcox p-value
F23, Sp22, Sp20, Sp19, F17	Control	166	69.6	72.5	0.0006998
F25 & F24	Treatment	67	80.1	90	
F23	Control	32	74.7	75.0	0.003124
F25 & F24	Treatment	67	80.1	90	
Sp22	Control	31	69.7	69.0	0.01026
F25 & F24	Treatment	67	80.1	90	
Sp20	Control	33	70.1	69.6	0.0478
F25 & F24	Treatment	67	80.1	90	
Sp19	Control	30	77.2	87.5	0.6861
F25 & F24	Treatment	67	80.1	90	
F17	Control	40	55.9	65.0	0.0003454
F25 & F24	Treatment	67	80.1	90	

Figure 2 shows the distribution of the exam scores, comparing the treatment group (fall 2024 and 2025) with the overall scores of the control group (other five semesters). The treatment group's box sits noticeably higher than the control's, with a median around 90 versus 72.5 for the control group, indicating higher typical exam performance under the treatment semesters. The treatment group is also tighter (IQR ~ 25 points, from ~70 to ~95) than the control group (IQR ≈ 34.8 points, from ~55 to ~90), suggesting less variability among treated students. Typical values (whiskers) run from about 40 to 100 in the treatment group compared with about 5 to 100 in the control, and while both distributions reach 100, the control group includes a single 0 outlier, whereas the treatment group shows a few low outliers in the 10–30 range. Looking at the two treatment semesters individually, fall 2024 centers higher (median ≈90, IQR ≈28) than fall 2025 (median ≈86, IQR ≈25), but both sit well above the control group's center. Overall, the box plot communicates a higher central tendency and a narrower spread for the treatment group relative to the control.

The rank-biserial correlation, |r| = 0.28 indicates a small-to-moderate effect. Bootstrap resampling (10,000 iterations) produced a 95% confidence interval for the mean difference ranging from 3.83 to 17.00 points, indicating that the treatment cohort outperformed the Control Group by approximately 4–17 points on average.

Overall, the findings suggest that the SGAs intervention was associated with a meaningful improvement in student outcomes. However, it is premature to draw conclusions on the effectiveness of SGAs as described in the "Limitation of Quantitative Results" section.

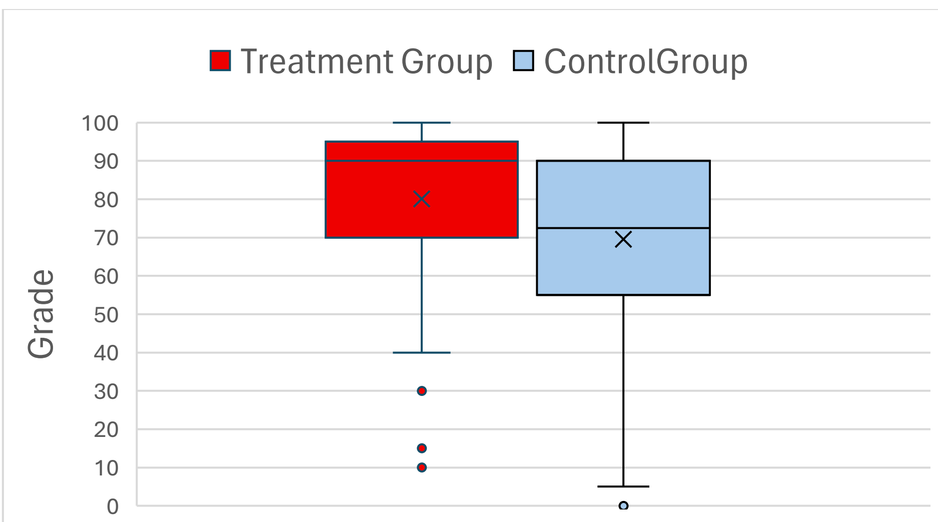

Figure 2 - Distribution of the 3D equilibrium exam scores, comparing the treatment group (fall 2024 and 2025) with the overall scores of the control group (other five semesters shown in Fig. 1)

Table 3 shows the average and median grades of students' final dynamics exams. Based on Table 1, fall 2025 and spring 2022 are the only valid data for dynamics exam comparison. The average and median scores of the treatment group (fall 2025) are 11.3% and 13% higher than those of control group (spring 2022). The data is not normally distributed, and the Wilcox-p value is less than 0.05, indicating a significant difference between the averages.

Table 3. Final Dynamics Exam Score

Semester	Group	Average	Median	**Wilcox p-value**
Spring 2022	Control	66.1	74.5	0.04084
Fall 2025	Treatment	77.4	87.5	

As shown in Tables 2 and 3, the results are promising, showing statistically significant improvement in students' performance. However, it is premature to draw conclusions on the effectiveness of SGAs as described in the "Limitation of Quantitative Results" section.

Student Feedback on Self-Graded Homework

Students' perception about the SGAs was assessed by an anonymous survey administered towards the end of each of the three semesters (fall 2023, 2024 and 2025). Figures 3 and 4 show the students' response to the multiple-choice questions *"How would you rate your experience with self-graded assignments?"* and *"Self-graded assignments are beneficial for your learning,"* respectively.

Comparison of Quantitative Results Across Fall 2025, Fall 2024, and Fall 2023

Student Ratings of Their Experience with Self-Graded Assignments, Fig. 3

Throughout the three semesters, students consistently evaluated the self-graded homework approach positively, though the distribution of ratings shows clear positive trends over time as shown in Fig.3:

Perceived Benefit of Self-Graded Assignments for Learning, Fig. 4

A similar upward trajectory is evident in students' views of the learning value of self-graded assignments as shown in Fig. 4.

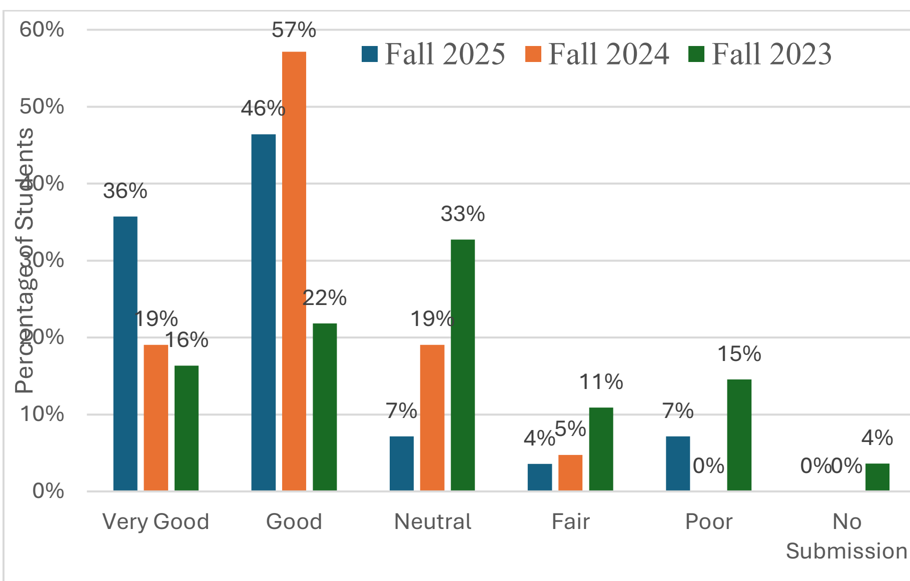

Figure 3 - How would you rate your experience with self-graded assignments?

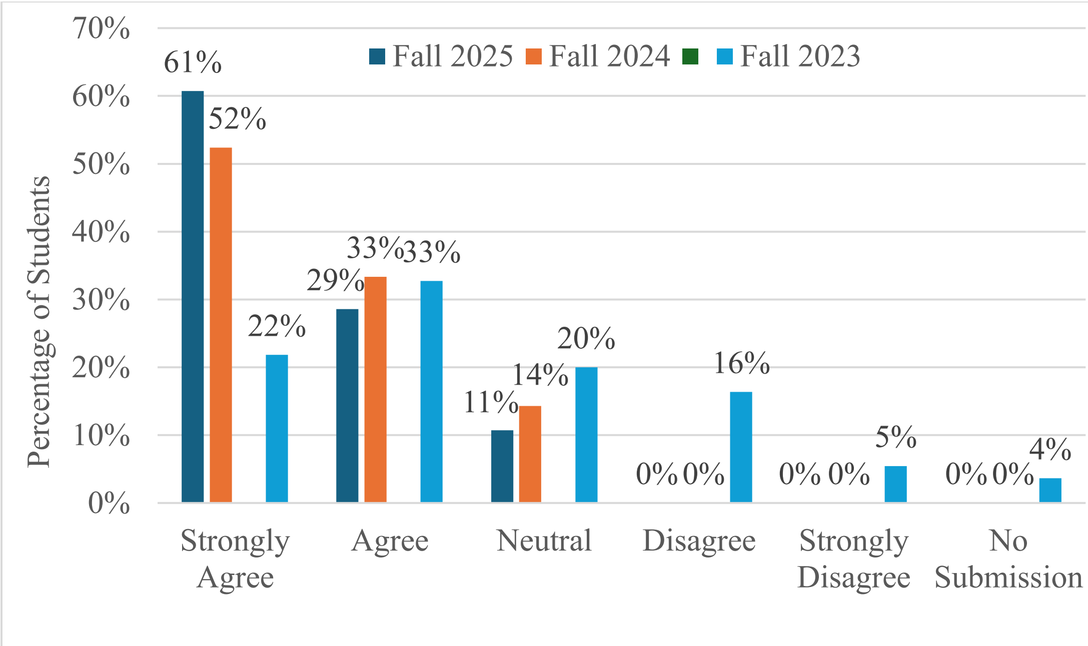

Figure 4 - Self-graded assignments are beneficial for your learning.

Analysis of students' open-ended survey responses, Appendix B, revealed several prominent themes regarding their experiences with self-graded homework. *Overall, students expressed strongly positive perceptions*, emphasizing the approach's value for learning, error recognition, and exam preparation.

Perceived Benefits

The most frequently cited benefit was the opportunity for *deep reflection and error diagnosis*. Students appreciated being able to retrace their steps, compare their work directly with fully worked solutions, and identify exactly where their reasoning or calculations diverged. Many noted that this process made them *remember not to make the same mistakes again* and helped them *reinforce exactly what [they] needed to do for a given problem*. Students also highlighted the assignments' alignment with class methods and exam expectations, describing the rubric as clear and helpful for building productive problem-solving habits.

Several students mentioned increased *metacognitive awareness*, indicating that grading their own work "forced" them to review concepts more thoroughly than traditional online homework systems. However, no awareness metacognitive inventory was introduced. Some students valued the partial-credit structure and the sense of "forgiveness" it provided compared with auto-graded platforms.

Challenges and Drawbacks

The primary concern was the *additional time commitment* required to grade their own work after completing the problems. Students described the process as *time-consuming*, especially for longer or multi-step problems. A smaller subset expressed uncertainty regarding how many points to deduct when their solutions differed slightly from the provided key. A few students felt that occasional assignments with five problems were overly lengthy relative to their schedules.

However, many students indicated no significant negative aspects, and several wrote simply "nothing."

Suggestions for Improvement

Students offered a range of improvement suggestions, though many stated the assignments were effective as they were. Common suggestions included:

- Reducing the number of problems per assignment or ensuring more consistent workload across assignments.
- Providing more time to complete and grade the homework.
- Adding hints or partial scaffolding, such as initial steps, key equations, or example free-body diagrams.
- Displaying assignments in advance (e.g., in the syllabus) to aid in planning.

A few students recommended expanding the number of self-graded problems, while others suggested integrating them more closely with in-class examples.

Comparison with McGraw Hill Connect

When asked to compare self-graded homework with McGraw Hill Connect, a clear majority preferred the self-graded format. Students felt these problems more closely matched the material covered in class, the instructor's methods, and exam expectations. Many also noted that self-graded homework eliminated the frustration of dealing with randomized or unfamiliar online problems and avoided the financial cost of purchasing an online platform.

A small number favored McGraw Hill due to its automatic grading, built-in textbook access, and video resources. Several students suggested a combination of both, noting that McGraw Hill assignments helped reinforce foundational skills, while self-graded homework offered deeper conceptual challenge.

Overall Trend

The data show a clear upward progression in student satisfaction from fall 2023 to fall 2025. Over time, fewer students reported negative or neutral perceptions, and more reported strong positive experiences. This suggests continued refinement of the self-graded homework structure between 2023 and 2025 contributed to greater clarity, usability, or alignment with student expectations.

Student belief in the educational value of self-graded assignments increased markedly over the three semesters. By fall 2025, strong agreement more than doubled compared with fall 2023, and disagreement was eliminated entirely. This pattern reinforces the qualitative findings: students increasingly recognized the benefits of reviewing mistakes, comparing their work to instructor-developed rubrics, and engaging in metacognitive reflection.

Limitations of Quantitative Results

It is premature to draw strong causal conclusions from the quantitative results due to several methodological limitations. First, all comparisons were made across different semesters, introducing uncontrolled variability in student cohorts, instructional pacing, exam difficulty, and external disruptions. Without randomized assignment or parallel control sections, differences in exam performance may reflect semester-to-semester fluctuations rather than the effect of SGAs. Second, no diagnostic baseline data - such as prior GPA, math/physics preparation, or pre-tests - were available to establish the equivalence of cohorts. This makes it impossible to determine whether the treatment group entered the course with stronger backgrounds.

Third, exam problems differed across semesters. Although the instructor always attempts to maintain consistency in topic coverage and problem structure, the specific 3-D equilibrium exam questions were not validated for equivalence in difficulty or cognitive demand. Exam scores exhibited natural variation, further complicating attribution of gains to SGAs. Fourth, only effect sizes and confidence intervals for the combined treatment vs. control distribution were computed; additional statistical analyses (e.g., semester-to-semester effect sizes, non-parametric confidence intervals, and distribution visualizations) would strengthen the robustness of conclusions.

Future work should incorporate controlled comparisons, validated isomorphic exam questions, baseline diagnostics, and longitudinal tracking of skill retention to better assess the causal impact of SGAs.

Summary and Conclusion

This work examined the implementation and evolution of self-graded assignments (SGAs) across different semesters, taught by the same instructor, in an engineering mechanics: statics and dynamics course. The results demonstrate that structured self-grading, supported by clearer rubrics, earlier release of assignments, access to intermediate and final answers, and increased opportunities for collaboration, can meaningfully enhance both student performance and student perceptions.

Quantitative analysis of exam performance showed that students in the treatment group significantly outperformed students in previous semesters across multiple comparisons. For the 3-D equilibrium statics exam problem, the treatment group achieved higher averages and medians than control semesters, with Wilcoxon tests indicating statistically significant differences in nearly all comparisons ($p < 0.05$). Similar gains were observed in the final dynamics' exam, where the treatment cohort outscored control cohort by 11.3% on average and 13% on the median. These results suggest that SGAs, when thoughtfully designed and paired with time for reflection, can strengthen conceptual understanding and performance in multi-step mechanics problem-solving.

Student perception data further reinforces these findings. Survey results from fall 2023 through fall 2025 reveal a clear upward trend in satisfaction and perceived learning benefit. By fall 2025, more than 80% of students rated their experience with SGAs as "Very Good" or "Good," compared with only 38% in fall 2023. Similarly, 89.3% of students in fall 2025 agreed or strongly agreed that SGAs were beneficial for their learning, with disagreement eliminated entirely, an improvement from the more mixed responses seen in fall 2023. Open-ended feedback highlights that students valued the opportunity to analyze their mistakes, compare their solutions with detailed rubrics, and revisit difficult concepts, though some noted time demands as a challenge.

While SGAs show promising improvements in students' exam performance and perceptions, these findings must be interpreted cautiously due to several limitations. The comparisons were made across different semesters, introducing uncontrolled variability in cohort preparation, instructional pacing, and exam difficulty. No diagnostic baseline data, such as prior GPA or math/physics readiness, were collected to establish equivalence between treatment and control groups, limiting the ability to draw causal inferences. Furthermore, exam problems differed between semesters and were not validated for equivalent difficulty, making performance differences difficult to attribute solely to the SGA intervention. Future research should incorporate controlled experimental designs, validated isomorphic exam problems, baseline readiness assessments, and longitudinal tracking to better understand the causal impact of SGAs.

Despite the limitations, the preliminary data suggest that SGAs hold potential as a metacognitive tool that enhances student engagement, supports deeper learning, and may complement or partially replace traditional online homework systems. Continued investigation will further clarify how self-grading practices can be optimized to empower learners, reduce grading burdens, and improve academic success in foundational engineering courses.

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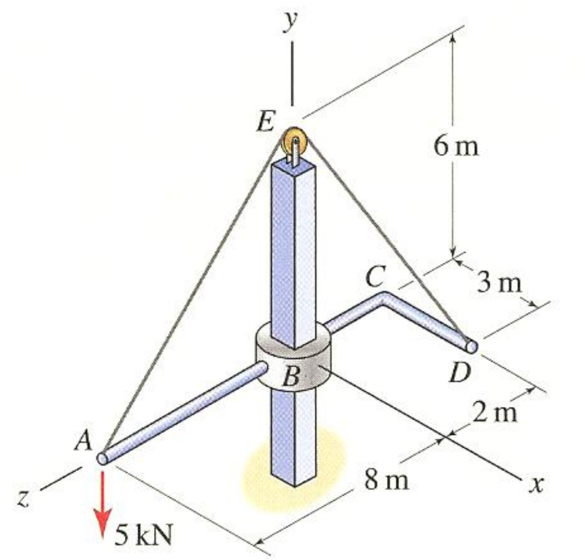
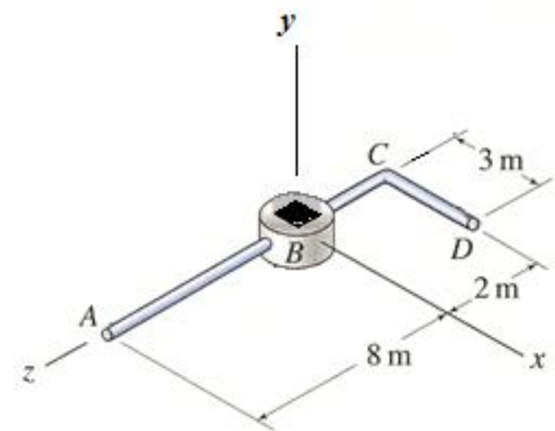
Appendix A – Self-Graded Problem

Bar *ABCD* is supported by a cable *AED*, which passes over a frictionless pulley at point *E*, and a collar *B* that slides without friction on a vertical shaft with a square cross section.

a. Draw a complete Free Body Diagram of the body *ABCD* below.



FBD



b. Determine the tension in cable AED and all support reactions.
Answer: $\vec{B}$ = [1.47 0 1.76] kN, $\overrightarrow{M_B}$ = [-29.4   0 -8.81] kN.m,
$F_{AE} = F_{DE}$ = 3.43 kN (T)

Figure A – 3D Equilibrium Self-Graded Assignment (Fall 2024 and 2025)

Appendix B – Survey Questions

What did you like best about grading your own homework?

It helps to understand where I went wrong in the problem and not make a mistake next time
Being able to see my own mistakes and use that experience for future problems.
Being able to note the correct answer and still get partial points rather than none on McGraw.
Allowed me to reflect and learn from my mistakes.
The grading rubric provided gives a really good idea of what steps you are getting wrong. It also builds a good habit of following the steps exactly that the Professor wants you to follow, as each step is worth points in the self-graded assignments.
I could go over where I went wrong
I was able to see exactly where I went wrong if I did go wrong
I can see my mistakes and apply them in future assignments
I did like that we were able to see the direct answer after it was unlocked.
It gave us a paper trail that was easy to find and use. I liked the caliber of the question and time given to do them.
It made me go back and see my mistakes and where I was going wrong in the process to then fix and learn from it.
It was nice to look back and see what I did right and wrong because having to mark points off myself makes me remember not to make the same mistakes again. I also liked the fact that the answers would point out the important/key steps of the problems based on what received points
Seeing where I went wrong and how to do it correctly
forcing myself to review solutions and revisit problems
What I liked the best was that I got to see the mistakes I made, and that helped me learn more. The solutions would show me what I got wrong and how to do it correctly
I was rewarding work through a troublesome part of the problem and saw how close I was to getting it right. Often found times when I was more eager to try the question because I knew I had the correct answer, it was just up to me to apply my conceptual knowledge to get it. And any time I was stuck it was easy to pinpoint with what I was struggling.
Give me a chance to see my own mistakes.
It helped me to see exactly where I was getting things wrong and reinforce exactly what I needed to do for a given problem. It really put into perspective what I had to do better than what doing a problem on Connect would have. Also, having to weigh my chances of my calculations being right or wrong did not help my confidence. I do not think dynamics on Connect would have been a pleasant experience.
That I can compare step by step my solutions, but what the professor has and rule out any little mistakes that may cost significant point on the test. Ex. Direction, signs , FBD
You can clearly see the mistakes you made along the way to the answer, also see how the grading works for the course.
It lets me review my work and see what I need specifically to work on
I would look back at the material rather than completing it and moving on. It is common to receive a grade back for an assignment and then never review that material because you're not willing to look for the mistakes. However, looking for the mistakes if what helps you learn what to fix for the next time around.
When I grade my own homework, I feel like I am doing it again, and it helps me understand more.
I like the fact that we are given the answer so if we don't get it right automatically, we can work it out again and see what we need to fix

What did you like the least about grading your own homework?

Nothing
It takes a while to grade and remember to do it after already turning in the homework
for me it was basically finding the extra "Time" in my schedule to grade an assignment that already cost me time to complete on the first place. However, I do Understand on the importance of seen once work.
Nothing really
When grading my answers sometimes I was unsure of how many points I should take away.
Losing points for skipping steps.
nothing really, wasn't a big deal
nothing really
Having to take points away from my own grade...
The thing I liked least is that sometimes there were steps I had a little different and I marked it wrong because it didn't match the answer key, but I had the answer right
There really wasn't anything bad about it
I have nothing to say because I liked them.
It was sometimes hard to grade the long problems.
Sometimes there would just be a tricky problem that would stump me and take me more time than the other questions to do. I don't think that's necessarily a bad thing, but it was something I liked the least about the self-graded homework.
It's a little more time consuming
They were quite long questions, but overall, there was not anything I didn't like about them.
Like I previously said, the Self-Graded homework can be a bit time-consuming, but in general, this is an intensive and time-consuming class.
What I like the least about grading my own homework is that it takes extra time. Some time I turn it in missing some pages, but it still helps me learn.
The thing I liked the least about the self-graded assignments is the number of questions we do for an assignment, like one had 5 questions while others had 1. I wished that they all had maybe 2 or 3 questions each.

How can we improve the self-graded assignments to be more effective?

I think it is ok how it is
Not sure
Having them in the syllabus would be helpful as to when they are coming up for planning time to do them effectively
I feel that up to the part where the professor is going through the grading during the class is good.
More often and only 1 or two problems the ones with 5 where a little rough
A better due date, and consistency.
Not sure, though they were challenging and a good learning tool
less questions and more time to complete them, I think they are greatly beneficial, but the amount was excessive especially when we have like three other classes, work, and outside of school commitments.
N/A

I think these should be optional!
Provide hints like with how to start an equation and what must be in it or an example FBD
Problems that are going to be like quizzes and exams. But they were already good. Giving the answers is helpful because it forces us to try until we get it right
I wouldn't mind having a larger packet of self-graded questions for the week - or instead of larger, have one that includes some of the problems we do on the board in class. We'd already have some work done from in class, group members would be more inclined to help during group work.
I think they are sufficient as is currently.
I think the way they are currently are fine.
Honestly, I feel that the Self-Graded assignments are especially useful and not too long, so I'm not sure what could be improved upon.
To do the homework more effectively, I think having 5-10 problems for each assignment would be the best.
I don't think anything about the questions need to change.

Do you prefer Self-Graded Assignment or McGraw Hill Connect online Assignment? Would you like a combination of both, or would you rather eliminate one of them? Any reasons?

Self- graded
Combination of both but I think the self-graded homework is like tests and quizzes which helps
Self-graded but with hints(?) I liked how McGraw Hill had the textbook to reference and similar problems. However, the self-graded problems felt more relevant.
I prefer the McGraw Hill Connect assignments, due to the ease of grading, however I see how it is beneficial to see your mistakes and grade your own work.
A combination of both, however I prefer self-graded. I struggled with McGraw early in the course.
I prefer Self-Graded Assignments
I believe a combination of both is good. I felt the McGraw homework was typically easier than the self-graded assignments but served as a useful tool for reinforcing knowledge. The self-graded homework felt more like challenge problems than reinforcement, but I think it's good to be challenged in relaxed environments without time constraints. I liked the McGraw homework better simply because they were easier to complete for full points, but I think it's good to keep both
I prefer self-graded compared to McGraw Hill
I like the self-graded better than McGraw hill just because they are more like what we have been doing in class, but the amount of self-graded assignments for sure need to be cut back or at least given more than two days to do them.
I prefer self-graded assignments
The online assignments are better in my opinion as you can watch the videos on them.
I would prefer Self graded online assignments. I would rather eliminate McGraw Hill, the homework never helped me, and their explanations were confusing anyway. I think that the self-graded has the same effect and students will not have to pay for the book/homework.
I prefer the self-graded because the McGraw hill problems are super hard. I would rather eliminate the McGraw Hill
Self-Graded because I can work with others and not have to worry about if they have different numbers and because hearing how other people remember things or how they show you helps me

I preferred the McGraw Hill Connect online assignments for statics because they were exceedingly difficult and did a good job overpreparing you for exams. The self-graded was significantly easier because the professor only gave us simpler problems.
I prefer the Self-Graded assignments only because the problems are the same ones we are using in class, the quizzes, and exams. The online assignments most often are different from the ones in class or are completely different.
Get rid of McGraw Hill and keep the self-graded work. Not only did I tackle the questions more effectively, but I also just enjoyed the format much more. For whatever reason, the McGraw hill content sometimes felt like it was a departure from what we would work on in class.
Self-graded has better problems which I liked better than McGraw. I would eliminate McGraw.
I liked using both as they appropriately challenged me in ways that I thought were complimentary to what we were doing in class. I would say that the McGraw Hill Connect works best for the first two units and then for dynamics the self-graded homework worked better than doing it on Connect.
I prefer self-graded assignments. Eliminate McGraw, because it saves us money and I feel like the self-graded assignments relate more to the material covered in class
Rather eliminate the McGraw Hull Connect since the questions are randomized and could result in the question having a method that was not taught in class, it is also easier to print out the self-graded stuff so I can work it out on hand
Self-graded more was more beneficial
I would prefer McGraw hill entirely.
I prefer Self-Graded assignments. Although they tend to be a little more time-consuming than McGraw Hill because I can try repeatedly until I get the correct answer, they include much more helpful questions. To explain, the Self-Graded are more closely related to the methods and topics covered in class compared to the McGraw Hill. Therefore, having McGraw Hill Connect would not be necessary.
I like Self-Graded Assignment more than the McGraw Hill Connect online Assignment. I learn more from Self-Graded Assignment than with online ones.
I prefer self-graded assignments, but I also like the McGraw Hill Connect homework. I would say maybe one self-graded assignment every 2 weeks is very helpful. And then maybe instead of 12 McGraw homework there should be a bit less, so it can be half and half.