Strategies for Reducing TA Demand in Courses

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Background

Recent budget cuts at the university level have led to the reduction of teaching assistants (TAs) available in each department. The previous policy for TA assignment (10 students = 1 TA hour) may no longer be possible. Because of this reduction, CEE faculty are encouraged to attempt to reduce their demand on TAs. Several strategies are outlined in this document.

Strategy #1: Utilize Learning Assistants in Class

LAs are students with relevant prior coursework who have received pedagogical training to work in partnership with instructors as they facilitate collaborative student learning in the classroom. The LA Program at FIU is part of the STEM Transformation Institute and is currently the largest LA program in the US. In Fall 2015, the Provost announced a university-wide initiative and positioned the LA program to play a vital role in the transformation of undergraduate STEM courses. The LA model includes:

- **Practice:** LAs gain hands-on practice with facilitating learning and providing feedback to students and faculty.
- **Pedagogy:** First-time LAs take a weekly pedagogy seminar that covers aspects of cognitive learning and sociocultural learning.
- **Preparation meetings:** These are regular meetings between faculty and LAs that allow the team to reflect on the previous week, review materials for the upcoming week, discuss sticking points that students encounter, and to address any other student concerns.

Faculty working with LAs are expected to:

- integrate evidence-based pedagogy into their course
- be responsible for recruiting and selecting team of LAs
- meet weekly with their LA-Team
- collect and share data about student outcomes with the program
- participate in pedagogy-focused professional development

LA commitments:

- LAs are required to take the LA seminar (SMT 3931) during their first semester as an LA. This seminar covers various aspects of teaching that LAs use to support students.
- LAs are required to prepare for and attend every class session and weekly planning meetings.
- Optional: LAs are available outside of class for office hours and/or LA-lead review sessions

**Important Dates**

The application is open year-round; however, initial funding is considered for applications submitted on or before **October 1th** (for spring courses) and **February 22nd** (for summer and fall courses).
How to Apply

Faculty in all disciplines are encouraged to apply for the Provost LA Initiative funding. Each instructor must submit their own application at:

https://laprogram.fiu.edu/

For more information you may contact:

Hagit Kornreich Leshem (hkornrei@fiu.edu), STEM Transformation Institute
Strategy #2: Work with Tutoring Center

The Center for Diversity and Student Success located at the College of Engineering and Computing (second floor) facilitates the academic achievement of our students by providing peer-tutoring in a variety of upper-level engineering and construction management courses. Offering a hybrid model of either virtual or in-person, students can access tutoring in all CEC majors.

The Center for Diversity and Student Success has many tutors who can assist students in the following courses (related to our programs):

- EGN3311 Statics
- EGN3321 Dynamics
- CGN2420 Computer Tools
- EGN3342 Thermodynamics
- EGN3613 Engineering Economy
- EGM3503 Applied Mechanics
- EGM3520 Mechanics of Materials (available soon, one MS student is in the hiring process)
- CWR3201 Fluid Mechanics (looking for tutors at this moment)

Other courses can be added to the list when needed. Faculty may advertise that are looking for tutors to previous students and encourage interested students to reach out the Center. Tutors can be FIU undergrad or graduate students. The person to contact at the Center is

Andrew Green, agreen@fiu.edu
Associate Director, Center for Diversity and Student Success (CD-SSEC)
**Strategy #3: Canvas Tools to Auto-Grade or Accelerate Grading**

Canvas has many different tools that can help with grading of assignments.

**Canvas Quizzes / Assignments**

Quizzes can be developed on Canvas and used for Quiz, Assignment, and/or Exam grades. General information can be found at [https://fiuhelp.force.com/canvas/s/article/Quizzes](https://fiuhelp.force.com/canvas/s/article/Quizzes).

Quiz questions can be many different types, including:

1. Multiple Choice
2. True/False
3. Fill in the Blank
4. Multiple Answer
5. Multiple Drop Down
6. Matching
7. Numerical
8. Formula
9. Essay
10. File Upload

Most of these question types will be automatically graded when the student submits their answer. You can set whether the student immediately sees the correct answer and feedback.

One type of question that is useful for engineering courses is the “Formula” type question. This type of question allows the input of variables in the solution and a range for the variables to allow for up to 200 random solutions.

An example is provided below from Dr. Garber’s “Prestressed Concrete Design” course.

**Formula Question Example (from Dr. Garber’s “Prestressed Concrete Design”):**

The input for the problem includes narrative with variables placed in [brackets]. An example is provided below:

```
Calculate the cracking moment to use in the ACI 318 V_{ci} equation for a composite member with the following properties. f'_c = [fc] ksi, A_p = [Ap] in^2, f_{pe} = [fpe] ksi, e_p = [ep]", A_g = [Ag] in^2, s_b = [sb] in^3, A_c = [Ac] in^2, s_{bc} = [sbc] in^3, M_d = [Md] k-in, \lambda = 1.0.
```

A range of possible solutions needs to be provided in the variable definitions. An example for this question is shown below:
A formula is provided in the solution. For this problem, the solution is based on the following formula:

\[ M_{cre} = \left( S_{c,b} \right) \left( 6\lambda \frac{f_c}{f_c'} + \frac{A_p}{A_g} + \frac{A_p f_{pe} e_p}{s_b} - \frac{M_d}{s_b} \right) \]

This formula is written in the following format for the Canvas solution entry:

\[ \text{sbc} \times \left( 6\sqrt{\text{fc} \times 1000}/1000 + \text{Ap}\times \text{fpe}/\text{Ag} + \text{Ap}\times \text{fpe}\times \text{ep}/\text{sb} - \text{Md}/\text{sb} \right) \]

Up to 200 different solutions can be generated based on the defined variable ranges. The error margin is also set in this section.

Student feedback can be added to the green (feedback for correct answers), red (feedback for incorrect answers), and blue (general feedback) boxes.
**Canvas Rubrics**

Setting up rubrics in Canvas can help to grade written assignments more quickly. A rubric can be created in Canvas and set up so that you click on a grade for each category to determine the grade for a student. Custom feedback can be added to each category and general comments can be added to the end as well.

A sample rubric from a written assignment from Dr. Garber’s “Prestressed Concrete Design” course is shown below.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Ratings</th>
<th>Pts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrated conceptual knowledge</td>
<td>3 pts Excellent</td>
<td>3 pts</td>
</tr>
<tr>
<td>The student has strongly demonstrated that they understand the concept(s) that they were tasked to write about.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 pts Good</td>
<td>The student has demonstrated to an average degree that they understand the concept(s) that they were tasked to write about.</td>
<td></td>
</tr>
<tr>
<td>1 pts Fair</td>
<td>The student has demonstrated to some extent that they understand the concept(s) that they were tasked to write about.</td>
<td></td>
</tr>
<tr>
<td>0 pts Poor</td>
<td>The student has not shown that they understand the concept(s) that they were tasked to write about.</td>
<td></td>
</tr>
<tr>
<td>Quality of support / explanation</td>
<td>3 pts Excellent</td>
<td>3 pts</td>
</tr>
<tr>
<td>The student has provided sufficient evidence for their answer and clearly articulated / illustrated ideas, concepts, or processes.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 pts Good</td>
<td>The student has provided sufficient evidence for their answer, but quality of articulation / illustration ideas, concepts, or processes could have been improved. Or no illustrations provided.</td>
<td></td>
</tr>
<tr>
<td>1 pts Fair</td>
<td>The student has provided some evidence for their answer, but quality of articulation / illustration ideas, concepts, or processes could have been greatly improved.</td>
<td></td>
</tr>
<tr>
<td>0 pts Poor</td>
<td>Support / explanation could not be easily followed.</td>
<td></td>
</tr>
<tr>
<td>All aspects or parts of question addressed</td>
<td>2 pts Excellent</td>
<td>2 pts</td>
</tr>
<tr>
<td>The student has responded fully to the prompt and answered every part of the questions.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.33 pts Good</td>
<td>One aspect of the prompts was not addressed.</td>
<td></td>
</tr>
<tr>
<td>0.67 pts Fair</td>
<td>Multiple aspects of the prompts were not answered.</td>
<td></td>
</tr>
<tr>
<td>0 pts Poor</td>
<td>No aspects of the prompts were answered.</td>
<td></td>
</tr>
<tr>
<td>Spelling and grammar</td>
<td>1 pts Excellent</td>
<td>1 pts</td>
</tr>
<tr>
<td>The student has proofread and shown an attempt to boost their professional ethos by addressing grammatical and mechanical issues.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.67 pts Good</td>
<td>The student may have proofread the document, but several spelling/grammar issues still present.</td>
<td></td>
</tr>
<tr>
<td>0.33 pts Fair</td>
<td>Numerous spelling/grammar issues.</td>
<td></td>
</tr>
<tr>
<td>0 pts Poor</td>
<td>Document was difficult to read and understand due to spelling/grammar.</td>
<td></td>
</tr>
</tbody>
</table>
Peer Reviews

Canvas allows for “Peer Reviews” to be added for any assignments. These peer reviews can be automatically assigned to students at the due date or another date under the different options when you are editing an assignment in Canvas.

Peer reviews for each student show in a list under the students’ name. Below is an example from Dr. Garber’s “Advanced Reinforced Concrete” class.

Technical Brief #1 Peer Reviews

Student peer reviews will be considered complete when students have commented at least once on the page and filled out the rubric form for the assignment.

Student #1 Name
✓ Student #2 Name
✓ Student #3 Name
✓ Student #4 Name

The students’ comments are shown for each student and can be combined with the rubric discussed above.
Peer reviews can be used as the grade for assignments or to help with grade assignment by the instructor.

**Turn-It-In Plagiarism Review**

Canvas also allows for automatic plagiarism review of assignments through Turn-It-In. This option can also be modified under the different options when you are editing an assignment in Canvas.
A Turn-It-In report is automatically generated for all submissions. This can be used to help quickly determine if students are plagiarizing.

Clicking on the percentage report on Canvas will direct the instructor to a more detailed report on Turnitin.com.

**Group Submission Option**

Students in a class can also be placed in groups. This allows students to work together in the class, which can be beneficial for their learning, and also decreases the number of assignments that need to be graded. This is again an option under the different options when you are editing an assignment in Canvas.
You will need to assign the students to groups or let them sign up for their own groups. This option will pop up when the “This is a Group Assignment” option is checked.

The class groups can also be accessed under the “People” tab on the left menu.

**Collaboration Tool:**

Collaboration documents can be created on Canvas and assigned to students’ groups. With Collaborations, students can use resources like Microsoft OneDrive to work with others on activities including group papers, presentations, and note-taking. The Collaboration page gives students and instructors a convenient place to track these active collaborative projects.

To create a particular type of collaboration, select the Collaboration tab from the menu, click "Start a New Collaboration" and then choose the desired Collaboration type from the dropdown menu. Then, select the people in the “Collaborate With:” field to include in the collaboration, when groups have been created, then the option to include a group will be available.
Instructor Training

To ensure that instructors are ready to use Canvas a variety of professional development options are now available, check at

https://canvas.fiu.edu/training/faculty/