



Gardner Institute

Gateways to Completion<sup>®</sup>

# Case Study Anthology

## About the Anthology

The peer-reviewed case studies included in this anthology represent the collective work of faculty and staff involved in the Gateways to Completion (G2C) process in the University System of Georgia and at Eastern Michigan University and Western Michigan University. Work on the anthology began in early Spring 2020, but authors were invited to update their cases in Fall 2020 to document the gateway course redesign work that occurred during the global pandemic.

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Dear Readers:

It is our great pleasure to present you with this case study anthology. When the Gardner Institute started its work with gateway course redesign nearly a decade ago, we had high hopes that a publication like this might be possible. What you are about to read exceeds our early high hopes in terms of both quantity and quality. This publication would not be possible without the contributions and energies of many persons. We owe them all our gratitude and deep respect.

Specifically, we want to thank all the faculty who contributed case studies for this anthology. Not only did they write the great submissions found in this volume; they did the hard work associated with course redesign that informed each and every one of the submissions. Without these faculty and their efforts, none of this would be possible. We also recognize that many staff and academic administrators were also involved in supporting this most essential work of the faculty.

In addition, we wish to thank the leadership of the University System of Georgia (USG) and the academic leadership of 25 USG institutions for their stalwart commitment to the six-year course redesign cause known as the University System of Georgia's Gateways to Completion project. As evidenced by the USG faculty case studies in this anthology, their efforts show that evidence-based, equity-minded, and faculty-led redesign of gateway courses is far more feasible and sustainable with the support and encouragement of senior leaders. A special thanks to the USG senior leaders, Drs. Tristan Denley and Felita Williams, whose constant championing and support of the USG faculty made all this possible

Case studies from several Michigan institutions are also included in this anthology and suggest similar conclusions about faculty-led and administrator supported gateway course redesign efforts. We thank the Kresge Foundation for supporting the Michigan Gateways to Completion project – a three-year course redesign effort in Michigan that involved 5 public universities and 4 community colleges. That effort produced the case studies found herein as well as many other auspicious results.

We would be remiss if we did not also thank two of our Gardner Institute colleagues, Dr. Stephanie Foote and Mrs. Carol Huhn, for the considerable time they spent diligently compiling and producing this publication. From concept to delivery, their coordination and production efforts helped this anthology become a first-rate resource.

Finally, we thank you, the readers, for what you might do in the present and future with what you learn from this publication. Gateway courses are an experience that must be critically examined and, with the support of evidence, redesigned to help higher education deliver on its equitable outcomes and opportunities promises. We believe the content in this anthology can help you in your efforts to create a more just gateway course experience for all learners – an experience that is based on evidence-based practices that, in turn, eliminate race/ethnicity and family wealth as the greatest predictors of who succeeds in foundational college courses.

We thank you for considering the content in this publication, and for what you will do with it in the pursuit of the broader higher education-related social justice goals we all hold near and dear.

Sincerely,



**John N. Gardner**  
Chair & Chief Executive Officer



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## Introduction to Financial Accounting (ACCT 2101) Course Redesign at Georgia Gwinnett College

Teaching Intro to Financial Accounting Using a Nontraditional Approach and its Effect on Students' Academic Performance

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Business programs have tried to improve the passing rates of students enrolled in the principles of financial accounting courses with very little success. The purpose of this study was to compare the traditional (preparer) versus the nontraditional (user) approach to teaching the course and its effect on the academic performance of 179 undergraduate students. The results suggest that students performed better at midterm using the traditional method and better overall using the nontraditional approach as confirmed by the Wilcoxon-Mann-Whitney test. These results have implications for how and when students are taught accounting topics and the effect on their academic performance.

### STATEMENT OF THE PROBLEM

Over the last three decades, business programs have struggled to redesign the first accounting course to improve its reputation and students' academic performance since the American Accounting Association (AAA) reported that many diverse groups have called for a change in the manner in which accounting is taught. Some researchers suggest that the traditional method of teaching principles of accounting is the problem. Nicol (1968) notes that accounting instructors have long used the traditional method of using the accounting equation to teach beginner accounting students the relationship between transactions, accounts, and the financial statements utilizing debits and credits. According to Penz (2002), it is the shortcoming of the instructor who fails to simplify his presentation, and the merit of the accounting text used that make the mastery of accounting principles difficult. The traditional accounting textbook introduces double-entry accounting at the beginning and uses it throughout the textbook, whereas the nontraditional accounting textbook uses a financial statement analysis model and introduces double-entry accounting at the end of the textbook. The purpose of this study was to investigate the effect of redesigning the first accounting course where double-entry accounting is introduced at the end versus the beginning and throughout the textbook. It has been noted that many students not only fail the course, but many withdraw from the course before the withdrawal penalty deadline. Applying a user approach by delaying the introduction of the double-entry accounting should increase the retention rate of students and enable students to gain their confidence, knowledge, and skills of accounting before introducing double-entry accounting, which is not covered until the last exam. The results of this study demonstrate the effects of a user versus a preparer approach of teaching principles of financial accounting on students' academic performance. Thus, we examine the following hypothesis:

H1: A traditional (preparer) versus nontraditional (user) approach to teaching principles of financial accounting provides different results for students' academic performance.

## METHODS

We conducted the study using a causal comparative design method. According to Gall, Borg, and Gall (1996) a comparative design method is the most suited method since it allows for the cause-and-effect relationships under conditions where experimental manipulation is difficult or impossible. The two instructors used identical course materials and assessments to teach the principles of financial accounting course for Spring 2019 using the traditional method (preparer approach) and Spring 2020 using the nontraditional method (user approach). The original sample consisted of 210 students enrolled in both semesters with 87 students enrolled in Spring 2019 and 123 students enrolled in Spring 2020. The final sample consisted of 179 students after eliminating the students who withdrew from the course. The students who failed to complete the final examination were not included in the analysis, although the results were not statistically different if they were included. The first step in redesigning the course involved selection of a user approach (nontraditional) textbook that focused on students learning accounting using a horizontal financial statements model spreadsheet to analyze financial transactions and their effects on various accounts, the accounting equation, and financial statements. The second step was to ensure students were prepared for class by requiring them to listen to short video lectures and complete a quiz at the end of each video, which accounts for 20 percent of the students' overall final course grade. The grade assessments also included in-class assignments and four exams. The authors analyzed the data using descriptive statistics and Wilcoxon-Mann-Whitney tests.

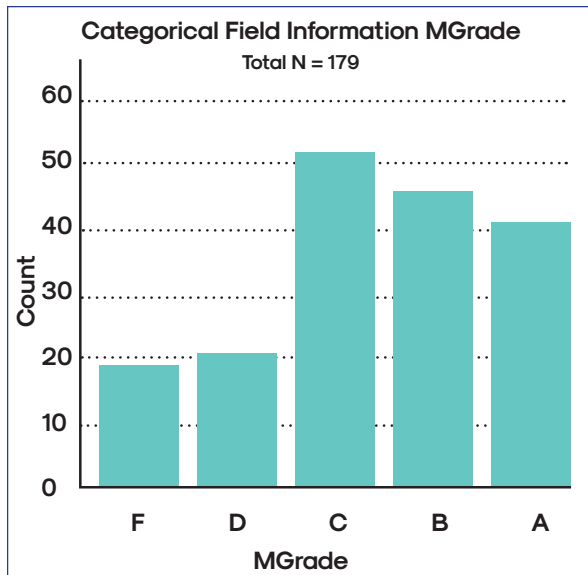
## OUTCOMES

Table 1 shows a comparison of the frequency distribution of midterm and final grades for the total sample of 179 students under both the traditional and nontraditional methods. The results show that the midterm grades have a mean of 3.39 and standard deviation of 1.26 versus the final grades with a mean of 3.59 and standard deviation of 1.15. Also, Figures 1 and 2 show that 40 students received failing grades (Ds and Fs) at midterm and 26 students received failing grades (Ds and Fs) for the final semester grade.

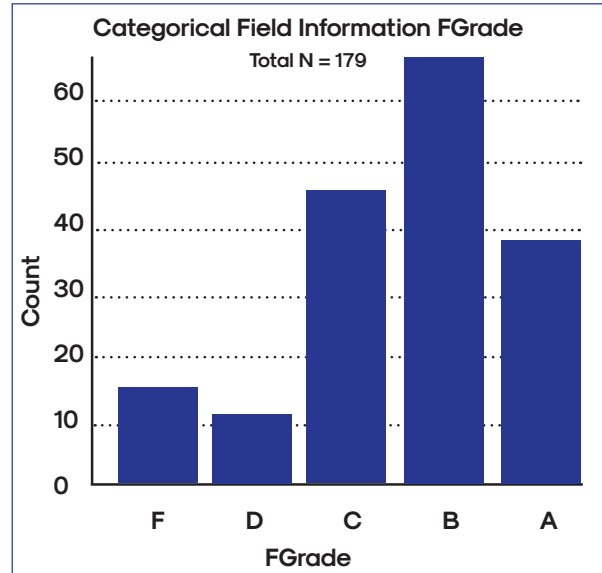
**Table 1**  
*Comparison of Frequency Distribution of Midterm and Final Grades*

	Sample (N)	Mean	Standard Deviation
Midterm Grade	Traditional (80) Non-traditional (99)	3.39	1.255
Final Grade	Traditional (80) Non-traditional (99)	3.59	1.145

**Figure 1**  
Midterm Grades

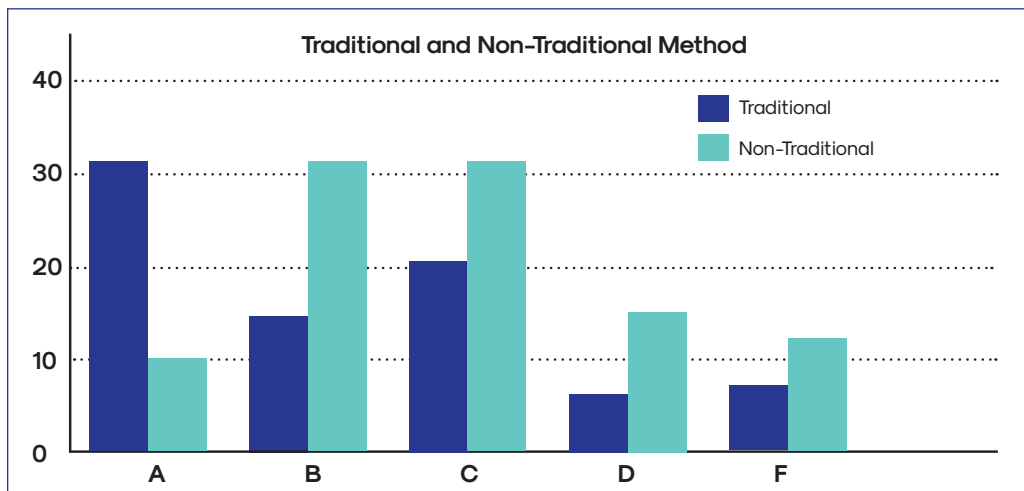


**Figure 2**  
Final Grades



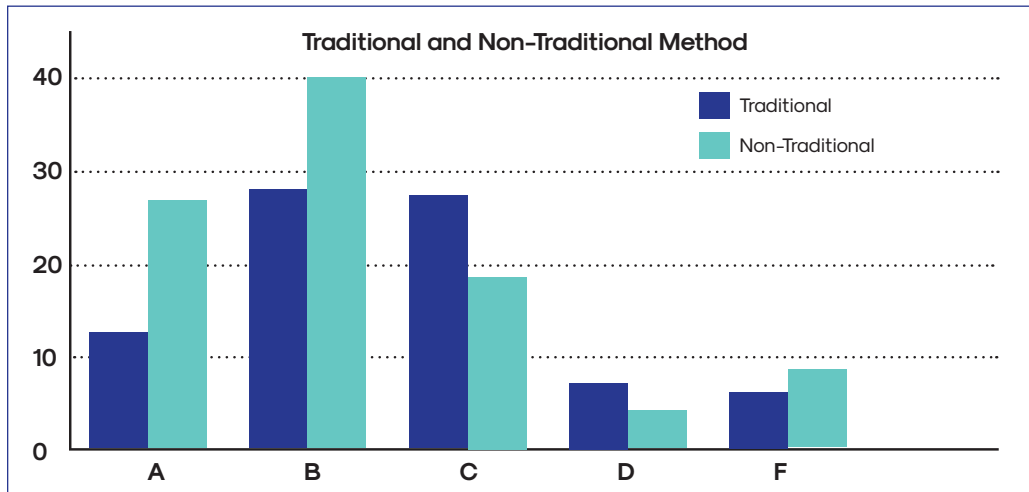
Next, we used the Wilcoxon-Mann-Whitney Test to determine whether there was a significant difference between students' academic performance under the traditional (preparer) versus nontraditional (user) method. This test is most suited for assessing the relationship between independent samples when at least an ordinal variable is used for two independent groups. The results show that H1 is supported. Figures 3 and 4 indicate a significant difference between the grades among students who used the non-traditional method compared to students who used the traditional method with Z statistics of -3.309 and -2.322, and p values of .001 and .020 for midterm and final grades, respectively. The results in Figure 3 indicate that the midterm performance of students was better under the traditional method (mean rank of 103.85) than the nontraditional method (mean rank of 78.81). However, Figure 4 reveals opposite results since the final grade performance of students was better under the nontraditional method (mean rank of 97.74) than the traditional method (mean rank of 80.42).

**Figure 3**  
Midterm Grades from Spring 2019 (Traditional) and Spring 2020 (Non-Traditional)



**Figure 4**

*Final Grades from Spring 2019 (Traditional) and Spring 2020 (Non-Traditional)*



Additional tests using Chi-Square statistics also show a significant relationship between the students' performance using the traditional versus nontraditional methods. The Spring 2020 nontraditional method significantly differs from the Spring 2019 traditional method with a p value < .001 for midterm grades, however the differences between the methods for the final grade were insignificant with p value of .067.

## DISCUSSION AND CONCLUSION

The purpose of this study was to investigate the effect of redesigning the principles of financial accounting course by introducing debit and credit double-entry accounting at the end of the textbook versus throughout the textbook. Specifically, the study examined students' academic performance using the nontraditional (user) versus the traditional (preparer) approach to teach principles of financial accounting. The timing of when debit and credit double-entry accounting is introduced is one of the major differences between the two approaches. Overall, inconsistent results were found between the two approaches. In particular, the results show differences between the students' midterm and final grades. The Wilcoxon-Mann-Whitney Test indicates that the traditional method of teaching principles of financial accounting improved students' midterm grades, which was also confirmed with Chi-Square statistics. However, the nontraditional method of teaching principles of financial accounting improved students' overall final grade. These findings are important because they show that it does matter when and how accounting topics are introduced in the first financial accounting course. Based on the mixed results between the traditional versus the nontraditional approaches, the authors plan to extend the study next semester.

## PLANS FOR CONTINUATION AND EXPANSION

First, the authors will increase the sample size by including students enrolled in traditional courses taught by other professors while adding control variables to help interpret the results. Second, the authors plan to implement an early intervention virtual tutoring policy at the beginning of the semester to identify students who are considered high-risk for failing the course. The results of this study and future studies have implications that are likely to bring forth changes to the accounting curriculum and how and when students are introduced to various accounting topics with the ultimate goal of improving the passing grades for students enrolled in the principles of financial accounting course.



## LESSONS LEARNED

One of the main lessons learned from this study is that the traditional way of teaching principles of financial accounting may not yield the best academic performance for students, thus, a change may be needed. Another lesson learned is that other factors could be affecting the students' academic performance based on the mixed results found between the traditional and nontraditional approaches of teaching the course. However, the results do indicate that it does matter when and how accounting topics are introduced to students and other factors should be considered in analyzing students' academic performance. A notable limitation of this study is that the authors did not conduct an actual experiment or control for other variables such as gender, grade point average, number of credits taken (workload), student majors, teaching style, etc., which have been found significant in prior studies on students' academic performance. The limitation of the causal-comparative method is that it may be difficult to establish causality based on the collected data (Gall, Borg & Gall, 1996). Based on the above limitations, there are many opportunities for future research. An expansion of this study in the future may take researchers beyond a causal comparative study and establish stronger associations between the traditional versus nontraditional methods of teaching the principles of financial accounting course. Another avenue for future research may focus on the academic performance of various business majors since all business students are required to take principles of financial accounting.

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## Human Anatomy and Physiology (BIOL 2451K) Course Redesign at Georgia Gwinnett College

### Using Student-Faculty Contracts and Self-Monitoring to Increase Student Success in Anatomy and Physiology I

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Human Anatomy and Physiology I (API) is a gateway course to careers in allied health. In order to be competitive for nursing, medical, and physical therapy programs, students need to be successful in API. Yet, most students have not had the experience with the rigor and substantial content of material that is required for this course. In this case study, we used known theories of behavior change that have worked in allied health to improve student success. The results of the study have implications for how and when students are taught accounting topics and the effect on their academic performance.

#### STATEMENT OF THE PROBLEM

Anatomy and Physiology I (API) is a gateway class to careers in allied health. Nationally, Human Anatomy and Physiology courses are believed to have among the worst undergraduate course failure and withdrawal rates (Hopper, 2011). Success in Anatomy and Physiology courses has been shown to be an excellent predictor of success in nursing programs (Lewis & Lewis, 2000). Therefore, in order to be competitive for admission to nursing, medical, or physical therapy programs, students need to be successful in API. Based on personal experience, most students are not prepared for and have not had experience with the rigor that comes with API in which 16 substantial chapters of material are required in 15 weeks' time. In this case study, we used known theories of behavior change such as Contract Learning and component of Self-Regulation known as self-monitoring (timecards) that have worked to improve student success (Frank & Scharff, 2013; Sebesta, & Speth, 2017). In order to perform well in API, students need to hold themselves accountable and also know exactly what will be required of them in order for them to be successful. Many students underestimate the time required to learn large amounts of material (Bash & Kreiner, 2014), which can lead to time management issues and poor performance. To make students more self-aware of their actual study time, students were required to keep timecards of their study time for API. Data suggest that students who study longer hours (Sturges et al., 2016) and work less hours (Harris et al., 2004) are more successful in Anatomy and Physiology classes. Thus, the contract and timecard intervention serve to provide students with much needed understanding of the rigors of this class.

## METHODS

Students were required to sign a Student-Faculty Communication sheet (learning contract) indicating they were aware of the requirements to do well in the class. Seven items of importance were listed on the contract ranging from acknowledgement of the importance of attendance, due dates, integrity, and how to contact the professor. The most relevant statement they acknowledged indicated that they would need to study about 2-3 hours per day for the course to learn the material required adequately to perform well.

To make students more self-aware of their actual study time, they were required to keep timecards of their study time for API. Students were to include the date and time they began each study session and also the exact time each session was completed. Each log entry had the number of minutes of study tabulated and was summed for the week. Students were made aware that as long as they performed the task as stated they would earn full credit and they were to be honest and accurate.

During the first semester that this intervention was used, Anatomy and Physiology I students taught by one professor in 2 sections were given a Student Faculty Communication Sheet during the second week of class (after the add/drop period). In subsequent semesters (2 class sections of data), students were required to keep timecards in addition to the Student Faculty Communication Sheet. Relatively nothing major changed in teaching. Grades were compared with the previous classes taught by this professor (5 sections).

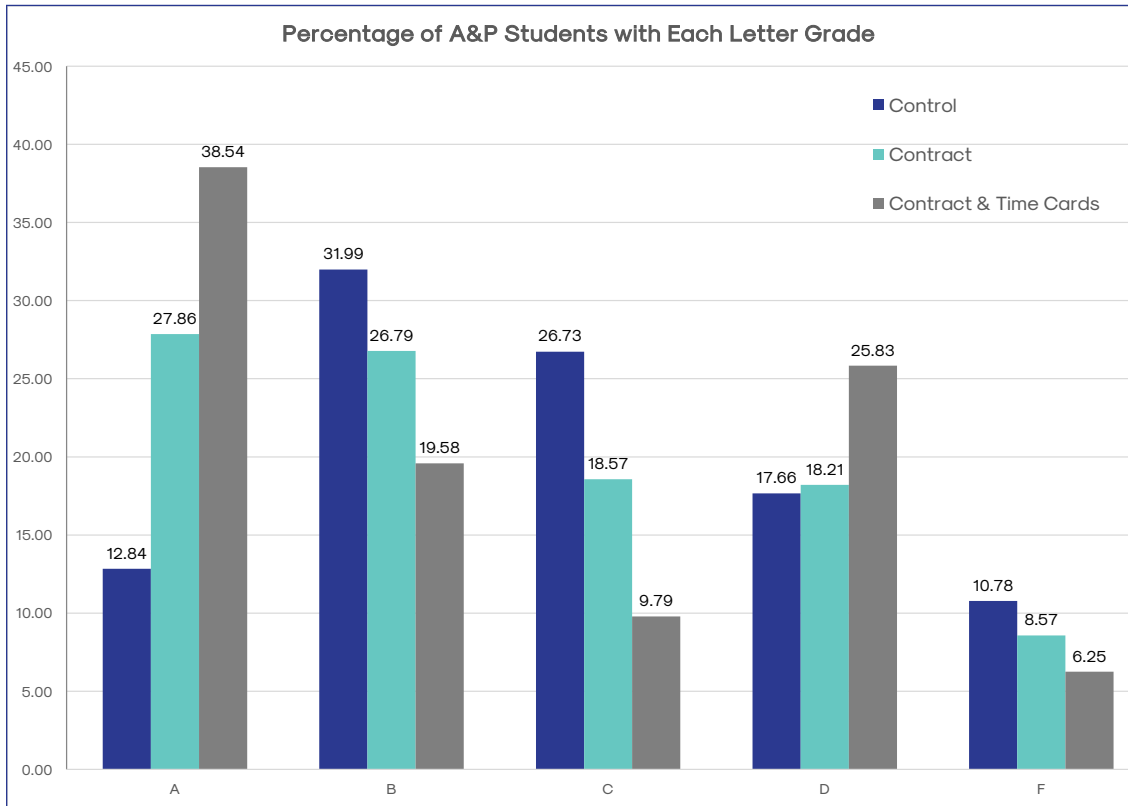
## OUTCOMES

Percentage of course grades (A-F) are presented in Figure 1 for the control period (5 sections), contract only (2 sections) and contract + timecards (2 sections). The data demonstrate that percentage of As earned was increased (up to 3 times the amount) in classes with the contract + timecard when compared to the control class sections. Additionally, for the most current semester (1 section), when correlating the amount of time spent studying and the course grade (expressed as a percentage of total points), a positive correlation is demonstrated ( $r = 0.60$ ) (Figure 2). Study time does not explain all the variance in student success. Factors such as study skills, sleep, motivation (Sturges et al., 2016), previous educational experiences (Harris et al., 2004), among others, likely play a pivotal role as well. We also do not know the accuracy with which all students indicated they studied, which could have influenced the outcomes. Students have indicated initially they did not understand why (even though it was explained in detail) logging their time would improve their success in the course, but they noticed the difference and their success in the class was directly related to the amount of study and dedication to learning the material outside of class.

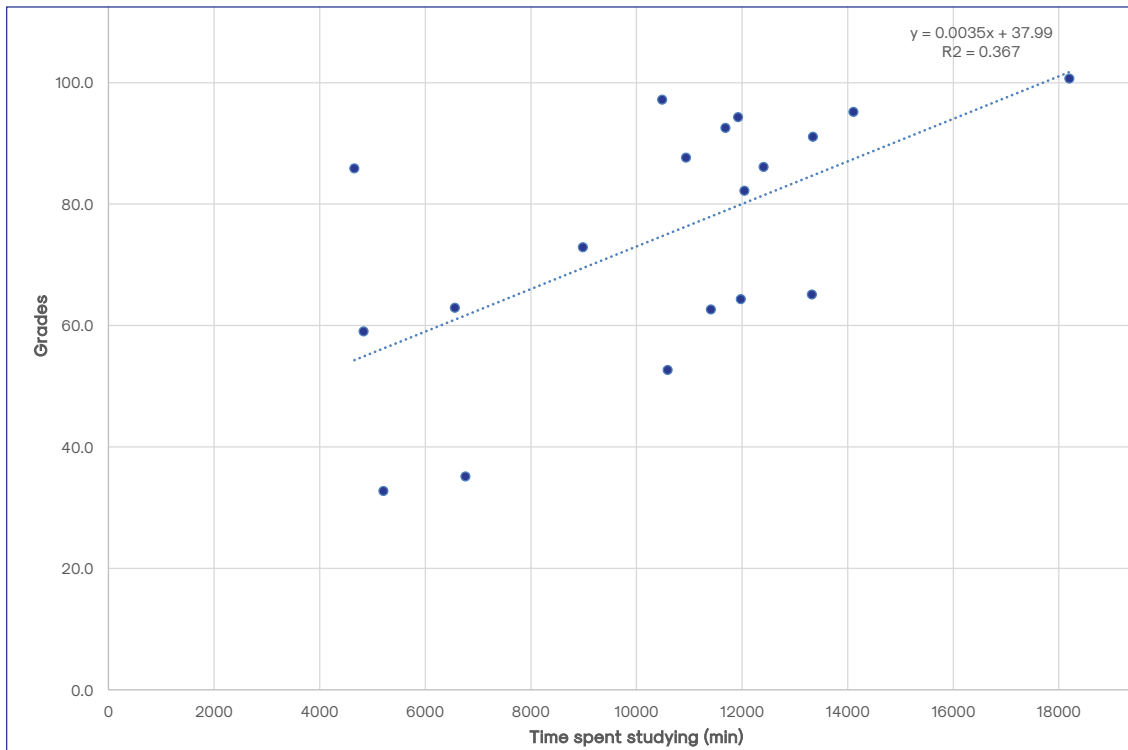
## PLANS FOR CONTINUATION AND EXPANSION

The contract + timecard intervention will be rolled out to six faculty teaching 12 sections in the 2020-2021 academic year. With this larger roll out, we will be able to address issues related to teaching styles (e.g. hybrid, online, face-to-face) and student demographics that may affect equitable outcomes (e.g. gender, ethnicity, first generation status, repeat status, previous GPA, number of credits during the semester, work hours). We will also be able to follow students into the next semester to determine if this intervention affects Human Anatomy and Physiology II course grades.

**Figure 1**  
*Percentage of A&P Students with Each Letter Grade*



**Figure 2**  
*Time vs. Grades*



## LESSONS LEARNED AND POTENTIAL IMPLICATIONS

Students often underestimate the amount of time required to learn so adding the timecard component enhanced the findings over using the contract alone to allow students to visualize the amount of time they are devoting to studying. Additionally, given the rigor of this class, an understanding of student demographics influencing course grades will initiate further interventions targeted toward specific groups or suggestions related to specific preparation prior to taking this class. There are also numerous studies that indicate a contract can make people more aware of their behavior and result in a positive change. The results were a considerable increase in the number of As over previous semesters. It appears that making students more aware of what is required, how much they are studying, and requiring them to make a study schedule can result in improved performance and warrants further future investigation.

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# Human Anatomy and Physiology (BIOL 2451K) Course Redesign at Georgia Gwinnett College

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Problem-based learning (PBL) is used in healthcare professional programs because educators recognize students separate theoretical knowledge from practical knowledge. PBL equips pre-nursing students with active learning and scientific literacy competencies. In the current study, pilot sessions occurred in Spring 2020 with 2 PBL tutors and 10-15 students/session. Sessions included review, PBL activity, wrap up, and assessment. Participants (100%) felt the session length was just right. Most (89%) felt the PBL session increased their interest/skill level. All (100%) felt they studied more effectively and were more independent learners due to PBL sessions.

## STATEMENT OF THE PROBLEM

Problem-based learning (PBL) pedagogy focuses on students identifying and resolving problems from a real-case scenario, usually in small groups through self-directed learning facilitated by peer tutors (Li et al., 2019). PBL is often used in healthcare professional programs because healthcare professional educators recognize that students often separate theoretical knowledge (the knowing that) from practical knowledge (the knowing how) (Benner, 1984; Craddock, 1993, Ehrenberg & Haggblom, 2007) leading to a theory-practice gap. Researchers (Sockalingam & Schmidt, 2011; Li et al., 2019) suggested that contrasted to traditional curriculum that separates theory and practice and emphasizes memorization, PBL encourages students to develop critical and active learning skills. Zhang (2014) suggested that additional years of practice and consistency in tutoring could affect the outcome of students' problem-based learning experience. Thus, the earlier the introduction of PBL pedagogy, potentially the more successful pre-nursing students will be within their pre-nursing science classes as well as long-term in nursing school. Georgia Gwinnett College (GGC) has almost 1500 pre-nursing students. Many of these students struggle in BIOL 2451K and do not achieve the grades necessary to progress in their chosen career path. The DFW rate over the last 7 years is 36+5% representing over 100 students a semester (15 sections/semester of BIOL 2451K, 24 students/section) who cannot continue. BIOL 2451K is usually taken in the 2nd semester of a 4-semester sequence of pre-nursing science classes. Students performing poorly in this class risk obtaining admission to nursing schools and/or other allied health profession programs. Anecdotally, course faculty suggest that unsuccessful attempts in BIOL 2451K result from students utilizing rote memorization to learn the vast amount of material required

in this course. A PBL pedagogy may assist these potentially unsuccessful students to develop scientific literacy and active learning skills, which are critical to success in pre-nursing courses and ultimately in nursing school.

## METHODS

This program was designed to equip pre-nursing students with active learning and scientific literacy competencies. Senior level Chemistry, Biology, and/or Exercise Science students served as peer tutors (PBL leaders). Subject matter expert faculty developed modules that addressed specific topics related to BIOL 2451K, such as study skills, homeostasis, data graphing, histology, bony landmarks, joint movement analysis, muscular anatomy, muscle mechanics, action potentials, neural system functional losses, and somatosensory functions. These modules reflected topics within BIOL 2451K with which students often struggle. Each PBL session included a topic review portion (15 minutes), PBL activity (30 minutes), wrap-up activity (15 minutes), and assessment (15 minutes) for a total of 75 minutes. For example, in the bony landmark module, the topic review portion involved discussion of specific bony landmark definitions. The PBL activity involved small groups of students discussing a case study related to clinical issues of skeletal anatomy (e.g., fracture or dislocation). Within the PBL activity, students were to determine the bony landmarks associated with the skeletal anatomy within the case study. The wrap-up activity involved the PBL leader reviewing and answering questions. The assessment activity involved 5 opinion questions related to the PBL session structure and material. Each module was presented multiple times within a week to allow for BIOL 2451K students to go to a session that worked within their schedules. Peer tutors met with the subject matter expert faculty prior to the PBL sessions so that the peer tutors were ready to present the material for each session.

## OUTCOMES

Pilot sessions were started during the first part of Spring 2020 with 2 PBL leaders and approximately 10-15 students per session (total of 51 students participated in three modules). The modules that were presented were 1) bony landmarks, 2) joint movement analysis, and 3) muscle anatomy. Due to the campus closure caused by the COVID-19 virus, no further modules were able to be presented. In evaluating the session critique information, students (100% of respondents) felt that the length of the session was just right (75 minutes per session). Most (89% of respondents) felt that the PBL session increased their interest and skill level in the subject matter presented. All (100% of respondents) students felt that they were able to study more effectively and were more independent learners in the subject matter presented as a result of the PBL session. Further, the students who served as PBL leaders enhanced their academic and personal development through the development of leadership skills and scientific literacy.

## PLANS FOR CONTINUATION AND EXPANSION

Ultimately, the goal of this program is to demonstrate its effectiveness to expand it to all five pre-nursing science classes. Funding for the PBL leaders was obtained through an internal grant from the Provost's office which ended this semester (Spring 2020). Ultimately, for sustainability and expansion of the program, the development of a specific 4000 level course in which students who wish to be peer tutors will enroll for course credit is necessary, similarly to other campus programs like Peer Supplemental Instruction (PSI) peer leaders. This type of upper level course would be in consultation with our college's Academic Enhancement Center. Additionally, the PBL program enables students to focus on practical applications of the knowledge learned in class. Given that healthcare education programs (e.g., nursing,

medicine, physical therapy) often focus on integrated learning experiences, PBL program will enhance students' abilities to function in these types of environments. The GGC Nursing Program reported in the campus communication, *The Pulse*, that the GGC nursing program has used a "flipped classroom" model since its inception. The flipped classroom model "flips" the traditional relationship between class time and homework. Students learn at home via online coursework and lectures, and teachers use class time for teacher-guided practice or projects. Thus, the earlier the introduction of PBL pedagogy, potentially the more successful pre-nursing students will be within their pre-nursing science classes as well as long-term in nursing school.

## LESSONS LEARNED AND POTENTIAL IMPLICATIONS

First, hiring student workers is a very difficult AND time-consuming process so offering a 4000-level course for credit may be better. It took over 4 months to hire the students, which put our project over a semester behind. Next, finding and training PBL leaders is critical to the success of the program. While ideally, senior level Chemistry, Biology, and/or Exercise Science students would serve as PBL leaders, finding students who were successful in BIOL 2451K provided only a small sample. Students who were pre-nursing represented even a smaller number of students because these students were only available for 1-2 semesters following BIOL 2451K due to the demands of nursing schools. In our experience, advertisement and encouragement from faculty for attendance (potentially offering extra credit). Attendance for the sessions was mixed. With only 3 modules in the pilot study, it is not clear if a particular time is better for BIOL 2451K students. We had sessions during a campus class free time on Tuesdays as well as twice on Fridays (day with fewest classes). Some faculty offered extra credit to attend. Potentially, offering these modules within classes instead of separate sessions would reach more people but need buy-in from faculty to move toward a "flipped" class model. In order to provide the material to the greatest number of students, it may be more beneficial to get faculty to provide the sessions within their classes. This will require buy-in from BIOL 2451K who may not be familiar with the flipped class and/or resistant to alternative types of pedagogy.

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## Principles of Chemistry (CHEM 1211) Course Redesign at Augusta University

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At Augusta University, Principles of Chemistry I - CHEM 1211 is taught in multiple sections with different, often inexperienced, instructors. Thus, there has been substantial diversity in instructional rigor and high DFW rates. In an attempt to mediate the student issues of inequality and assist instructors, common exams were introduced in Fall 2019. Comparing Fall 2019 to Fall 2018, withdrawal rates fell from 30% to 11% and success rates increased from 41% to 65%. In an end-of-course survey students, on average, rather liked the exams (3.6/5.0) and felt that the exams reflected course content (3.8/5.0). Performance in CHEM 1212 appears unaffected.

### STATEMENT OF THE PROBLEM

Substantial growth in General Chemistry enrollment and changes in the faculty corps of instruction have resulted in a high number of new and temporary instructors teaching Principles of Chemistry I (CHEM 1211). Chemistry tends to be a field where subspecialty is important to the types of courses an instructor is qualified to teach. However, as the introductory course for chemistry majors, CHEM 1211 is one that faculty with any chemistry subspecialty is able to teach. Consequently, as experienced instructors are needed in the advanced and specialty courses, CHEM 1211 is the most effective placement for new and temporary instructors. This has led to high diversity in the instructional rigor of this course. This instructional diversity impacts DFW rates as when students perceive the professor as “too hard” or “unfair” they may withdraw or give up. In other cases, the instruction is insufficient for students to be successful in the next course, DFW rates of the subsequent course will also be increased. In addition, new instructors tend to suffer from the “expert blind spot” which makes them overestimate the abilities of the students and underestimate the amount of instruction needed for students to be successful. It is very difficult to evaluate and remediate instructional issues in a timely enough fashion to impact student success. Since it is not logistically possible to assign only experienced instructors to this class, one of the G2C recommendations was to give common major lecture exams in all sections of the course. This would help instructors know the level to target for their instruction and students would be less likely to give up because their instructor is more difficult than the one their friend has. In addition, exams will be better quality with a mixture of experienced and inexperienced faculty working together to design the exams.

## METHODS

During preregistration for Fall 2019, a common (evening) exam time was made part of the schedule for the course. Using a detailed outline of course topics, these topics were assigned to each instructor to generate questions for the test—based on the topics that were expected to be completed by the time the test was given. One instructor was assigned to compile the questions. One week before the exam, the compiled questions were reviewed by the entire general chemistry faculty (instructors teaching CHEM 1211 and CHEM 1212, including the course coordinator). Questions were reviewed for clarity, correctness and appropriateness. The entire test was looked at for length and completeness of coverage. Questions were revised or omitted as appropriate. After a test was agreed upon, a grading rubric was designed. The instructor compiling the exam made the corrections and produced a second version of the exam. The second version scrambles the multiple choice answers and changes the values on some problems. It was then sent back to the faculty for a final review and approval. Once the test was generated, the department administrator made the appropriate number of copies. One of the instructors was in charge of getting the tests to the testing location. All instructors teaching the course proctored the exam. Each instructor grades the exams of the students from their own class. Scantron data of the multiple-choice portion of the exam was collected from all sections for assessment purposes.

## OUTCOMES

### Student Response

Students seemed to adapt well to this system. Most anticipated logistical problems did not materialize nor was there a higher than usual number of students who needed to make up the exam or take it at a different time. Students were surveyed at the end of the course about their opinion of this system. Using a 5-point Likert Scale the average student response was: Did you like having common exams? 3.6 Did you find the timing of the common exam convenient? 2.9 Did you find the location of the common exam convenient? 3.1 Did the common exam accurately reflect your classroom instruction? 3.8 Responses to open ended questions indicated that students both liked and disliked the environment (including time and location) of the exam which was different than their regular class. With few exceptions, students felt this way of testing created a class that was fairer than exams given by individual instructors. There were only positive comments about the ability to study and take the exam with friends from other classes.

### Success Rates

Withdrawal rates for the four sections of CHEM 1211 averaged 11% in Fall 2019 compared to 30% in the previous fall. This trend is continuing in Spring 2020, with midterm withdrawal rates of 10% compared to 17% for Spring 2019. Students earning an A, B or C for the course increased from 41% in Fall 2018 to 62% in Fall 2019. The American Chemical Society First Term General Chemistry Test was given as the final exam for this course. Students' average on this exam was at the 46th percentile based on national norms. This test was not given in previous terms so no comparison to previous terms is available. Most students who take CHEM 1211 go on to take CHEM 1212. In spring 2020, approximately 80% of the CHEM 1212 class consisted of students who took CHEM 1211 using the common exam system. At midterm, withdrawal rates were essentially the same (4.4% in Spring 2020 versus 7.7% in Spring 2019). Averages for the first two in-class lecture exams were similar or slightly better than previous spring terms.

### Exam Quality

While there is no direct evidence that exams were of better quality, the rewrites on a variety of questions suggest that was the case. For example, in exam 4, two multiple choice questions were discovered to have two correct answers. Some questions were revised when it was recognized that a question would take much longer for the student to work than the question writer intended. Other questions were revised in response to the question, "So how are you going to grade this question?" Reviewers were also able to spot questions that might be misinterpreted by students.

## PLANS FOR CONTINUATION AND EXPANSION

Assuming Spring 2021 will be taught in the traditional manner and appropriate testing locations will be available, common exams will be officially implemented in CHEM 1212 at that time. In fact, the same major tests were given in CHEM 1212 in the 2019-2020 academic year. This has not been advertised to the students in order to preserve academic integrity, since exams are not given at the same time in the same location as they are in CHEM 1211. The department of Biological Sciences is considering the same procedure for their introductory courses, but their curriculum is less established than for chemistry. Consequently, the logistics of implementing such an exam are more complex for this department and other issues (e.g., COVID-19) are taking priority.

## LESSONS LEARNED AND POTENTIAL IMPLICATIONS

Overall, common exams had a greater impact on DFW rates and fewer logistical problems than we expected. However, there were issues with the faculty culture that we did not anticipate. Ideally, there would be complete faculty buy-in from all instructors teaching this course before implementing this type of change. However, the very reasons for the change prohibit this possibility. Faculty teaching this course are often not on campus more than a week or so before classes start. Logistical considerations, like room reservations, must be made well before the previous semester's preregistration period. Revisiting the decision every year (sometimes even every semester) when course instructors change is impractical. If this is necessary, it is likely this recommendation, and any course standardization policies, would be abandoned.

To head off issues in the future, the department, in a series of meetings, formalized some of the standard policies for general chemistry that it had used informally in the past. The use of common exams and the weight given to these exams were two of the policies agreed upon. Committees were formed to develop detailed student learning outcomes for both CHEM 1211 and CHEM 1212. It is anticipated that these will be approved by the department in future meetings. In the future, when instructors for these classes are hired, the department can make the expectation of participation in a common course structure part of the job requirements.

## English Composition (ENGL 1101) Course Redesign at Georgia Gwinnett College

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After scoring several hundred essays over 2 semesters, we concluded that moving to TILT (Transparency in Learning and Teaching) assignments. We spent the beginning of year two designing the evaluation essay through TILT, primarily using the layout of purpose, task, and grading criteria to shape different approaches to the assignment (evaluating a sci-fi film, evaluating a major, evaluating an online product). The general findings of the data collection showed a range of student writing abilities across all seven criteria, demonstrating that a broad change in ENGL 1101 was needed, not restructuring a single assignment or section of the assignment.

### STATEMENT OF THE PROBLEM

Georgia Gwinnett College (a 4-year college that serves the most diverse population of students in the southeast) has a low-admissions standard and a unique body of students that struggle through their first year from a variety of obstacles: poor high school performance, low socioeconomic backgrounds, family demands, mental/physical disabilities, and general lack of preparation for college-level work. English 1101 Composition 1 (ENGL 1101) has a 60% pass rate average: students are not prepared for the rigors of college-level writing, students do not understand assignments in the course, and students do not value the work done in ENGL 1101 (learning to write on a college-level, critical thinking presented in written form, or academic research performed). Equability was a main feature of motivation for the redesign of ENGL 1101 because all incoming freshmen must pass the course as a prerequisite for the other required composition course, ENGL 1102, which is a prerequisite for other 1000-, 2000-level humanity courses. The impetus of this course is development of college-level writing and research with an emphasis on expository description and analysis. GGC follows Georgia's Board of Regents' regulations (that mandates students compose between 20-22 pages worth of writing cumulative), but individual instructors have freedom in assignments and pedagogical methodology in how they design, facilitate, and access the course work. Regulating equability in this course proved difficult because every instructor was trained at another academic institution and often followed traditions at their place of training and initially struggled to accommodate the specific needs of GGC students. TILT is designed intentionally

for disadvantaged, first-generation students as it explains to students the purpose for individual assignments, the sequence of steps to approach the task, and the criteria by which the assignment will be judged. For students across socioeconomic situations and varying levels of success in their education progression, TILT works well as an outreach with its accessible language, practical layout, and connection of course outcomes to student work. Research on TILT has shown improvement in retention even with only one assignment TILTed in a course. Intermediate goals included using ENGL 1101 as college prep for other courses, connecting assignments in the course to the course's outcomes stated explicitly in our college's catalog and syllabus, and offering faculty a wide array of possible assignments to use.

## METHODS

Because equability was the goal, our methods in introducing and applying TILT was to recreate assignments that linked course outcomes to individual assignments. Because we do not have a standard course for ENGL 1101 past that of the outcomes and objectives for the course, many instructors have academic freedom in how they teach writing as process or as a skillset in ENGL 1101. Rather than trying to enforce a mandatory syllabus or implement an obligatory standard for the course such as a prescribed number of essays or determined topic for each assignment, we chose TILT because it allows for academic freedom within each course, allowing instructors to utilize their pedagogical strengths in how they approach writing and its instruction for incoming freshmen. The course redesign is not so much a prescriptive list of what faculty should and should not do in terms of the semester layout, but rather a guideline for assisting in presenting information to students that seems reliable and effective in utilizing the purpose of the course, explaining the steps to take to finish the assignment, and describing the criteria for which the assignment will be evaluated. We broached the change slowly and progressively: in Fall 2019, all G2C committee members developed one TILT assignments for their courses. In Spring 2020, all faculty teaching 1101 developed their own TILT assignments. The goal for Fall 2020 is to have two TILT assignments in all 1101 courses, and Spring 2021 aims to have all assignments in 1101 TILTed.

## OUTCOMES

At the beginning of the G2C intervention, we decided to start the project by creating an assignment for an evaluation essay that would be given to students at the end of the semester, their last major assignment. In Fall 2018, all faculty teaching ENGL 1101 instructed students to write this essay at the end of the course, and faculty submitted random samples of this essay to the committee. In late Spring 2019 and Summer 2019, the committee scored 600 essays of evaluation to look for commonalities, problems, discrepancies, and general information as a baseline data collection. Reviewing all essays underneath a criteria rubric on a 5-point scale and then comparing fall 2018 data to Spring 2019 yielded no concrete results: students' ability to understand the assignment ran along the usual bell curve seen across college courses, students' writing ability also matched a standard bell curve in terms of skill-set demonstration, and all criteria scored tended to follow the same pattern with most of the students in the middle of the point system. After sharing the findings with the discipline, the committee decided to broaden its approach to include more general redesign objectives that would not target one particular assignment under a standard set of criteria but would allow instructors freedom in assigning work that best fit their pedagogical skills. Thus, TILT was implemented to be the major redesign of the course in which the change has happened in how assignments were presented to students, what assignments contained in giving information to students, and how students understood the grading criteria for assignments.

The outcomes for this change were resisted in the onset in several discipline meetings, but as faculty became more familiar with the TILT method and realize not only its implications but its accessibility (it's not hard to learn and some faculty were already using portions of it), the move to include TILTed instructions in one assignment in all of English 1101 became normalized. Other outcomes saw the discussion around assignments and methods used for English 1101 as disparaging from one course to another, and the need for equitability became even more obvious as faculty saw discrepancies in individual's TILT assignments. We posted assignments from the committee teaching Engl 1101 on our discipline's D2L page and then requested that all faculty teaching 1101 sent us their own TILTed assignment. We held two in-person sessions on TILT for English faculty, and the TILTed assignments came in from faculty, covering a range of assignments: description, narrative, analysis, visual argument, rhetorical proofs.

Several faculty members remarked on the feasibility of implementing TILT, mainly that arranging assignments through purpose, task steps, and grading criteria motivated them to redirect their attentions to assignments and make assignments more relevant to the teaching of writing as a process for current-day students. One faculty even noted that she assumed students understood the purpose of assignments but having to articulate it clearly helped her to envision students approaching the assignment, and she broke down the steps even more and saw students able to get started on the project immediately instead of asking bewildered questions about what they should do exactly.

## PLANS FOR CONTINUATION AND EXPANSION

At the end of Spring 2020, our goals for the next academic year (regardless of whether we are teaching in person or online) reflect the need to implement TILT into GGC English courses from 1000 to 4000 levels. The first step will be bringing TILT into ENGL 1102 as that is the obvious choice for its implementation into courses designed around writing or literature and could be particularly effective in classes that study rhetoric and composition as methods of writing because TILT itself is a current method of pedagogy which has its own rhetorical implications. The goal of 1101 as the first course that students take in their college coursework aims for students to develop college-level writing which speaks to a variety of audiences for a variety of perspectives across multilingual, multimodal, and multinational contexts. The methods and skillsets developed for writing in English 1101 serve students throughout their academic years and into their chosen careers because writing has implications in all areas of human communication and professional endeavors. TILT ed assignments have students learn to look for purpose, tasks, and criteria, approaches that enable critical thinking in other classes to parse out important pieces of information for the completion of assignments and later in the performance of multifaceted tasks in their chosen careers.

## LESSONS LEARNED AND POTENTIAL IMPLICATIONS

The lessons learned from this new approach to teaching have not accurately been recorded or tested because we are still in the initial stage of the changes. The switch to online learning in response to COVID-19 was another hurdle that we faced in normalizing the TILT approach, but as we moved to teaching the last 5 weeks of the semester online, the G2C committee encouraged English faculty to use and facilitate TILT in assignments as an effective online teaching method because it lets students see how the information is broken down into small steps that work towards overall progression in the completion of ENGL 1101.

# English Composition (ENGL 1101) Course Redesign at the University of North Georgia

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The Gateways to Completion English Department Committee was charged with developing and implementing pedagogic intervention(s) in English 1101 (ENGL 1101) during Fall 2019 to lower DWF1 rates with an eye toward equity in student outcomes. We redesigned the ENGL 1101 course with process pedagogy as an overarching pedagogical intervention. We piloted 18 sections of ENGL 1101 during Fall 2019 with macro- and micro-level interventions designed to support this overarching pedagogical intervention. Our mixed methods assessment plan highlights the effectiveness of such an intervention for students' learning while also highlighting adjustments to make as we scale up our redesigned course to additional sections of ENGL 1101.

## STATEMENT OF THE PROBLEM

ENGL 1101 focuses on informational, analytical, and argumentative writing skills that prepare students for college-level writing. This class comes with challenges for faculty and students. It is taught by English faculty with varied levels of expertise and research interests. In-class content and activities, therefore, varied; some faculty emphasize literature and some faculty emphasize rhetoric. These varied approaches posed challenges for our student population because the English Department was not offering a clear curriculum. Additionally, student populations represent different levels of college-preparedness and different demographics such as first-generation, Latinx, and dual-enrolled populations, which also varies across of 5 campus system. Consequently, we approached the redesign effort as an opportunity to provide pedagogical coherence for our varied student populations. To achieve our goal, we first ensured that the G2C English Department Committee (hereafter "Committee") was composed of faculty representatives from across our campuses and with varied backgrounds in teaching a course like ENGL 1101. We then developed an overarching pedagogical intervention termed process pedagogy. In this pedagogical approach, instructors focused on teaching writing as a process wherein drafting and revision figure prominently over the final written product during individual assessment.

As we further explain in the next section, process pedagogy helps students conceptualize writing as an extended and multi-level effort at drafting, reflecting, and revising, and the assessment of student writing, therefore, captures this intellectual labor. We believe that implementing process pedagogy in our pilot sections addressed equitable educational outcomes for two reasons. First, process pedagogy

has roots in the open admissions movement of U.S. higher education whereby instructors were working with students with varied educational preparedness and, therefore, developed a pedagogy and theory of writing wherein the labor of writing and the steps of writing figured more prominently in individual assessment over stylistic flourishes found in a polished product. Second, process pedagogy offers a foundation through which the English Department can build a more coherent ENGL 1101 curriculum and through coherence itself we can offer a more effective general education writing course for all our students.

## METHODS

Our Committee established one macro- and ten micro-level proposals for our course redesign with course caps lowered from 24 to 20 and professional development workshops to support faculty implementing the redesign. These aimed to promote an overarching intervention of process pedagogy, a pedagogy designed to help students to see writing not as the simple production of a paper for a grade, but rather as an extended and multi-level effort at drafting, reflecting, and revising, whose assessment captures this intellectual labor. In Fall 2019, we had 18 pilot sections of ENGL 1101 implement our chosen strategies taught by volunteer faculty members across four of our five campuses. All instructors adopted the macro-level change: using a portfolio system for grading, which encouraged revision and reflection activities, and allowed instructors to employ hybrid grading, rewarding student's commitment to process and metacognition. Instructors also chose at least three of our micro interventions to adopt: metacognitive scaffolds; weekly peer review; writing center visits; mandatory conferences; supplemental instruction for writing; multimodal composition; small group work; student-led discussions; three drafts per project; and journaling. While most pilot faculty elected to employ more than three micro interventions, the most common selections were weekly peer review, reflection activities, and sustained drafting.

To support instructors with these changes, we offered workshops. Pilot faculty attended two of the four offerings: 1) Hybrid Portfolio Grading, 2) Assignment Design, 3) Peer Review and Feedback, and 4) Metacognition/Growth Mindset; all pilot faculty were required to attend the grading workshop while they selected at least one of the others depending on the micro interventions they selected. From Fall 2019 into Spring 2020, our committee began IRB-approved research into the experiences of students and instructors in these pilot sections. Using Qualtrics, we administered a survey that asked students to provide quantitative scores for the macro- and micro-level interventions in their section, allowing us to rank the effectiveness of these strategies across all sections. We also conducted two qualitative methods of data collection: 1) semi-structured interviews with all pilot faculty, focusing these thirty-minute conversations on how they responded to our proposed curriculum redesign, and 2) discourse analysis of randomly collected student portfolios.

## OUTCOMES

Our assessment effort was centered on a mixed methods research design in which we simultaneously gathered quantitative and qualitative data in hopes of painting a rich picture of student learning. We interviewed pilot faculty (n=6) in a face-to-face setting early in Spring 2020 before the onset of the COVID-19 pandemic, surveyed pilot faculty (n=6) and students (n=53) and collected students' end-of-semester portfolios (n=10). The data were coded inductively based on repeating language students and faculty used that pointed directly to the interventions, process and that coding was then paired with the ranking system of the survey questions to connect the qualitative narrative to our quantitative



measurements. We see evidence that our redesigned efforts supported students' learning, and in the next section, we offer snapshots of our data.

### Portfolios

Most pilot instructors asked students to include within their portfolio a reflective cover letter, where the student offer their thoughts on their writing development during the semester. Some selected remarks: "Honestly... I genuinely enjoyed your English class.... I used to think research papers were some awful task that teachers assigned but it really does not have to be that bad. I have learned a lot about how to plan out the process to make it so much easier;" "This English 1101 course gave me the skills that I thought I would have gotten from high school, and also introduced me to new forms of writing and writing processes that I never would have expected to see. ... I actually developed a new view on education and began to appreciate teachers and professors more."

### Student Surveys

We asked students to rank the helpfulness of portfolios for strengthening their writing skills, with the options of not helpful, minimally helpful, moderately helpful, and very helpful. 71% of students identified portfolios as moderately to very helpful. Over a quarter of all survey respondents found portfolios are very helpful. Interviews: The quotes below regarding portfolios come from our interviews with pilot faculty. "Using the portfolio allowed students to actually engage in their writing process . . . they [students] had to show the complete process for one project, including all the small assignments, all the peer-reviews, all the feedback, and each draft. ... And process is one of the major outcomes of 1101 and so that is really, really helpful." "I think that process, going through the portfolios, having the more low-stake assignments, and then the bigger grade at the end, kind of supported them, and that they were less anxious, perhaps, about those first drafts, the rough drafts ... I think that it achieved a lot for students, their confidence, their revision process."

### DWFI Rates

Currently, our DWFI rate data is showing surprising results. Because we do not see DWFI rates as the sole determiner of student learning, we offer these rates in the context of our additional data points. We report a 10.76% (n=30) DWFI rate for students in pilot sections and a 6.8% (n=344) DWI rate for non-pilot sections. We report a 6.2% (n=7) DWFI rate for self-identifying Hispanic students in pilot sections and a 5.7% (n=96) DWFI rate for non-pilot self-identifying Hispanic students. Together, these data sets reveal disappointing results; however, we are heartened that we are working with a small number of counts, and the qualitative data illustrates how instructors and students spoke positively about this course.

## PLANS FOR CONTINUATION AND EXPANSION

Our redesign efforts have the potential to inform other courses, an exigent need given the USG general education redesign coming in Fall 2022. We believe the interventions implemented in our G2C pilot sections might especially aid in ENGL 1102, which will potentially be redesigned by the USG to address writing in and/or about the disciplines. For instance, a future iteration of ENGL 1102 that focuses on academic research and writing across disciplines might lower its course caps from 24 to 20 students, which allows for more focused feedback, and have portfolio assessment that can showcase the diverse genres of writing students have developed. A digital portfolio, often termed an ePortfolio, would function as a space for students to curate their varied genres that will serve them as they move through their chosen majors. Given that we are already in the midst of a course redesign in ENGL 1101, extending some of the interventions to ENGL 1102 will also build continuity for students across our campuses. Our

goal with continuation of pilot interventions in year 3 focuses upon expanding our scope of pilot sections across campuses. In Fall 2019, we had 6 pilot faculty in 18 sections; in Spring 2020, we had 7 pilot faculty in 11 sections. It is our hope to double our faculty engagement for Fall 2020.

## LESSONS LEARNED AND POTENTIAL IMPLICATIONS

Though our course redesign is still in process, we look back over our work and see two lessons learned that will have implications for our continued redesign efforts: First, redesign is a university-wide effort. To do this work well, we need to work in partnership with staff and students and additional units. For example, the Center for Teaching, Learning, and Leadership led discussions on course design, introducing many of us to foundational work on developing effective courses. The Office of Institutional Effectiveness tracked student data points that guided our decision-making. For redesign to lead to substantial and sustainable change, we learned that we need to work with faculty and staff across our university. We have a faculty-led committee, but we are doing this work with our broad university stakeholders. Second, we learned to complement quantitative data with faculty voices. Our committee was charged with designing the course with an eye toward lowering DWFIs rates, a charge that would be assessed with quantitative data on student grades. When assessing the effectiveness of our redesign efforts, however, we offered not only DWFIs rates but also offered qualitative data. We interviewed our pilot faculty and offered rich nonnumerical responses from our colleagues, thinking through the challenges and opportunities of these redesigned course. As we continue with our work, we learned the importance of complementing quantitative data with narratives offered by those doing the work in the classroom.

# English Composition (ENGL 1101) Course Redesign at eCore

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Jen Sands

After piloting an adaptive learning platform integration for ENGL 1101, we hypothesize that the following strategies better promote student success in terms of self-awareness, motivation, structure, engagement, and concept transfer: condensing interactive, multimodal content via the Learning Management Systems (LMS) platform for the purpose of mastery; encouraging student reflection through informal journal writing, metacognitive prompts, and revision; promoting learner agency via an adaptive quiz structure; and setting clear expectations through individualized rubrics and transparent instructions.

## STATEMENT OF THE PROBLEM

A redesign of ENGL 1101 using a particular adaptive platform was suggested by University System of Georgia (USG) Leadership in an effort to explore ways to make the course more scalable. eCore had used another adaptive platform in Math courses with much success, but after the bulk of a year's work, the adaptation of ENGL to fit the platform's specifications and limitations did not produce good results in the pilot: the user experience was confusing and clunky for students and frustrating for instructors, who had no control over the content and were accustomed to the more user-friendly grading process of their LMS (Desire to Learn, referred to herein as D2L). Undaunted, we set out to sidestep the technical barriers and utilize the questions that we developed specifically for the platform as formative assessment quizzes in a D2L-only version of the course as well—ostensibly for better comparison, but ultimately to assuage the feeling that, otherwise, all of our work would be for naught. After the adaptive courseware summer pilot, and attending the G2C meeting in October of 2019 and an ENGL 1101 presentation there, as well as speaking with multiple vendors, coordinators, and professors at different companies and institutions, we took additional steps to reduce the amount of content covered in the now "D2L-only adaptive" version of the course, choosing to focus on the mastery of fundamentals instead of finishing a Researched Argumentative Essay. We also added some reflective, informal writing at the beginning of the course, to reduce student anxiety, and after each major assignment, to help them absorb their instructors' feedback and plan accordingly for improvement.

## METHODS

At the launch of the project we were told that most of the work would be on the courseware side of the project team, relocating the content into their platform for the purposes of data-driven diagnostics. Our roles as Instructional Designer (ID) and Subject Matter Expert (SME) consisted of clarifying "nodes" in the course and providing an accompanying test bank of questions for each node that would offer students more opportunities to practice their knowledge of course content. As the project progressed and became increasingly demanding, however, it seemed clear to us that it was, if anything, going to be more difficult to wring clarity of purpose and skill out of the curriculum through the many limitations the courseware presented. By February of 2019, we had started a concurrent revision sans adaptive courseware, utilizing the questions we had created for the adaptive platform in D2L quizzes. These

formative assessment quizzes followed readings, preceded heavier assessments, and could be taken as many times as the student chose, with the average of all of their attempts recorded in the gradebook. Additionally, we revised final assessment instructions for transparency using the “TILT” format, created individualized holistic and analytical rubrics that directly reflected the TILTed assessments’ grading criteria, and separated parts of the course into smaller sections so that individual learning components were explicitly discussed, practiced, and evaluated. Much of this work was planned and accomplished during several all-day meetings between SME and ID in the Spring 2019.

## OUTCOMES

Results of the summer pilot of the adaptive platform version of the course were more disastrous than we had feared. While touted as easily accessible, personalized, and data-rich, the adaptive platform’s interface was not intuitive. Students also seemed confused by having to navigate multiple platforms. After the first few weeks, a specially designated Student Success team member had to be assigned to the course to follow-up and coach students on an individual basis, most of whom were falling behind. Quite a few students ended up taking Incompletes to finish their coursework. Our initial attempt at launching a “D2L-only adaptive” course coincided with the pilot launch, and, while students in the courseware pilot did demonstrably worse, we also determined that there was now simply too much content and too much work in the D2L-only course overall; it was near impossible for students to find time to re-take the quizzes when the next deadline loomed up so quickly.

After the chaos of the summer pilot, we continued to work on the D2L-only version of the course, trimming content and adding informal writing as low-stakes tasks to encourage student reflection on their role in the learning process, as well as promote objective self-evaluation of submitted work. We deleted the most advanced unit in the course and added a “Getting Started” unit, to which we redirected the Grammar review work (previously apportioned into each of the 4 units of the course), consolidating the grammar quizzes into one test that students could, again, take as many times as they liked to improve their grade. We also designed four approachable readings and corresponding Journal entries for the first unit: informal writing that drew on the students’ own experiences, prepared them for writing in a more low-stakes environment, and gave the instructor an opportunity to both respond positively to the students’ work, and to note any particular challenges they were having, so as to provide appropriate resources more readily.

We have also continually added feedback for all quiz question answers, so that students are not just left hanging with a wrong guess but provided with a timely explanation that can clarify nuances or correct misunderstandings. These explanations increase student confidence and performance, in that they are more willing to both take the quiz again and implement the skill in their writing, now that they understand the material better. In summer of 2020, we added some concrete suggestions as steps for students to take in the instructions for the Post-Assignment Feedback and Reflection Plans.

The process has been jangled and intense at best. However, despite the complicating effects of the COVID-19 pandemic, the 2020 data collected so far has shown marked improvement over 2019. The ABC rate went up anywhere from 1.3 percentage points (Spring SS1) to 10.3 (Spring full term), and the Course Completion rate went up anywhere from 1.3 (Spring SS1) to 7.9 percentage points (Summer). While we at first attributed this largely to midterm exams not being proctored, a closer look revealed that the average midterm exam grades stayed about the same between the two years.

## PLANS FOR CONTINUATION AND EXPANSION

We concluded that the lure of “shiny things” in terms of adaptive courseware and additional integrations should henceforth be judiciously weighed against the risk of creating additional barriers for students. Adaptive courseware, as it is currently built, seems better suited to math homework practice than in a course such as English Composition I, where students are literally learning how to learn and how to use writing — not only to communicate and persuade, but to think, both critically and creatively.

## LESSONS LEARNED

Additional platforms, if necessary, need to be consistent, reliable, and seamless for all involved, but particularly for first-semester college students, many of whom may have never taken an online course. Otherwise they will frustrate students and inhibit their progress, as well as divert faculty’s (primary) focus on instruction. Furthermore, faculty need to have the ability to modify their course content and alter deadlines as needed, and trust that their feedback is easily found and understood by their students. The continued availability of formative assessments helps motivate students to improve their understanding of concepts, as well as feel more empowered in the grading process. Detailed rubrics for individual assignments help students understand what to shoot for and how to improve and assist faculty in evaluating performance. Reflective student writings that evaluate their ideas about learning and their progress can be very helpful. Students learn to evaluate their efforts as well as their concrete achievements; additionally, they learn by doing so how the process of writing itself can assist their thinking and learning. These reflective assignments promote a sense of empowerment and responsibility, and act as metacognitive checkpoints that broaden students’ awareness of their study habits and strategies. Lastly, less is sometimes more. First-semester college students need enough time with both the course content and their instructor to learn foundational course knowledge. This may require (particularly in abbreviated, 8-week terms) a reduction in the number of assignments so that students can master the most critical components of the course.

## College Algebra (MATH 1111) Course Redesign at the University of North Georgia

### Redesigning College Algebra: A Vision for the Future

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The Gateways to Completion committee was appointed to study and redesign College Algebra at the University of North Georgia and began work in Fall 2018. The committee began the three-year process of examining the course, identifying areas of concern, proposing, piloting, and implementing the redesign. The committee studied data from the Office of Institutional Effectiveness, surveyed faculty and students, analyzed previously published objectives, created new objectives with sample questions, and piloted textbook curricula and online platforms. The 2019-2020 academic year began the enactment of the piloted redesign. The committee continues to analyze data in anticipation of year three.

### STATEMENT OF THE PROBLEM

The University of North Georgia (UNG) contains five geographical campuses with the following undergraduate student enrollments in Fall 2019: Gainesville (7,913 students), Dahlonega (7,296 students), Oconee (2,504 students), Cumming (1,291 students), and Blue Ridge (197 students) (Rogers, 2019). Dahlonega is the only campus with a residential student population. The remaining four campuses do not have student housing options. The target student population and corresponding faculty population are large. For example, in Fall 2019, the Math department served 2,726 College Algebra students who were enrolled in nearly 90 sections taught by 45 tenure-track faculty, 10 full-time, non-tenure track faculty, and 11 adjunct faculty. College Algebra is a gateway course for students entering a variety of STEM and non-STEM majors. Upon examination, we quickly realized there were significant differences between campuses in terms of student populations. Comparisons were made among a number of categories such as the number of financial aid recipients, first-generation students, dual-enrollment students, non-traditional students, students placed in mandatory co-requisite support classes, commuter and residential students, part-time and full-time students, as well as students of a given gender or ethnicity. Additionally, the committee collected final exams and syllabi from faculty in the department to learn what variation might occur in the teaching or administration of the course. We learned from category comparison that student populations are highly diverse and from the faculty's materials that the students' experiences are divergent, both in content and rigor. The actual charge of our committee was to work with an external partner, the Gardner Institute and our own Center for Teaching, Learning & Leadership (CTLL) to redesign College Algebra and improve student outcomes. We pondered how to effectively measure student success in College Algebra as one of the first steps on a pathway to a career in STEM and how to improve students' mathematical knowledge. Through the

professional development provided by the Gardner Institute and CTLL our visions for reform began to take shape.

## METHODS

With the wide diversity in the student population, faculty, and campuses outlined above, the committee members targeted a curriculum redesign to achieve uniformity in the learning outcomes across UNG campuses. Using Bowen (2017) and Fink (2013), the committee chose a backward design methodology to identify and describe the content outcomes and abilities for a student who has successfully completed the College Algebra course. We developed course themes, to be implemented throughout the semester, that support further learning in mathematics, based on STEM field requirements. Themes include the understanding of transformations, inverses, symbolic manipulation, graphing characteristics and real-world applications of classes of functions. In support of those themes, we established learning objectives with vocabulary and sample questions to aid instructors' focus of content and to justify rigor. Uniformity in the College Algebra curriculum across three campuses (and eventually across all 5 campuses) has not previously occurred in the history of UNG. Campuses still use different textbook partnered with various learning platforms. In Fall 2019, all 6 members of the Committee piloted the new objectives and sample questions in their College Algebra classes and gave a single pre-/post- assessment at the beginning and end of the semester. In addition, the Committee had ongoing discussions, meeting every other week, about our materials and the feasibility and enactment in the classrooms. There were 12 pilot sections with 331 students in all. The result of this pilot will be described in the next section.

## OUTCOMES

Data collected from the Office of Institutional Effectiveness (OIE) included pre-/post-test assessment scores as well as DFWI and non-DFWI data for both the pilot and non-pilot sections for all five campuses. In the Fall 2019, 18.59 % of students enrolled in the 12 pilot sections have been categorized as DFWI, whereas 22.25 % of students enrolled in the non-pilot sections were categorized as DFWI. The results of the pre-/post-test assessment for pilot classes were tallied by the committee and are as follows: Pre-Test, Post-Test means were 19.44 % and 63.66 % respectively. Likewise, the Pre-/Post-Test standard deviations were 4.99 % and 6.18 %, respectively. The expected value of the pilot Pre-Test data is 19.34 % with a standard deviation of 7.50 %. We found that, in the long run, if the mean Pre-Test data of 19.44 % is used to estimate UNG's Pre-Test population mean, then 99 % of the time, the population mean will be between 17.10 % and 21.79 % with a margin of error of 2.34%. It was obtained that the sample proportion of 40.79 % of students scored the expected Pre-Test score of 19.34 %. If the sample proportion data is used to estimate UNG's population proportion, then the population proportion will fall in the interval of (36.34 %, 45.23 %) with a margin of error of 4.44 % almost 90 % of the time. The expected value of the pilot Post-Test data is 66.83 % with a standard deviation of 20.85 %. We found that, in the long run, if the mean Post-Test data of 63.66 % is used to estimate UNG's Post-Test population mean, then 99 % of the time, the population mean will be between 60.97 % and 66.35 % with a margin of error of 2.69 %. It was obtained that the sample proportion of 41.69 % of students scored the expected Post-Test score of 66.83 %. If the sample proportion data is used to estimate UNG's population proportion, then the population proportion will fall in the interval of (37.23 %, 46.15 %) with a margin of error of 4.46 % almost 90 % of the time. The OIE has reported that the mean Pre-Test score for students in Fall 2018 was 18.33 %. We performed a t-test at the significance level 0.01. With the mean Pre-Test score, 19.44 %, obtained from the pilot sections, the test has concluded that there is not enough evidence to reject the fact that the mean Pre-Test score at UNG is still 18.33 %. The OIE has

reported that the mean Post-Test score for students in Fall 2018 was 56.67 %. We performed a t-test at the significance level 0.0001. With the mean Post-Test score, 63.66 %, obtained from the pilot sections, the test has concluded that there is enough evidence to reject the fact that the mean Post-Test score for the pilot sections has not increased. Thus, if the pilot sections are used for understanding the betterment of effective learning in College Algebra classes, our results show that at 99.99% confidence level the mean Post-Test scores for students has increased.

## PLANS FOR CONTINUATION AND EXPANSION

The statistics presented above on the pilot semester support favorable outcomes. To be clear, the outcomes of the pilot provides evidence for lower DFWI rates and an increase in College Algebra knowledge. The Committee has continued to make small changes to make the new curriculum adaptable to the five campus. Our next step is to broaden the scope of the study; and therefore, the Committee is moving forward with the vetting of the new curriculum redesign through the Departmental Curriculum Committee (DCC). The DCC has the authority to approve and make changes at a program level. They are tasked with understanding how our new curriculum impacts subsequent Mathematics courses of which there are many and determining how alignment among the STEM series of courses may change. These changes could significantly impact co-requisite support courses that are taught in tandem with College Algebra. Students that participate in co-requisite courses are particularly vulnerable. Furthermore, students that participated in the pilot sections have not had the opportunity to complete other courses yet; therefore, long term and lasting effects are yet to be determined. Wide scale departmental implementation is planned for the 2020-2021 academic year in phases. The Committee has requested a cohort approach with the direction of a professional development coordinator. With each cohort, we plan to continue to gather data and adjust as necessary.

## LESSONS LEARNED AND POTENTIAL IMPLICATIONS

With a thorough review and consideration of the content of College Algebra, and its place in the continuum of mathematics courses for students in the STEM pathway, the committee feels that it successfully trimmed and refocused objectives with the intent of ensuring students would be properly prepared for future studies. Increasing the focus on applications in algebra coursework did not come at the expense of students' mastery of those objectives considered essential to student success in the STEM pathway. Individual instructors retained the flexibility to emphasize some content areas more if they desired but a higher level of consistency in core knowledge ensures that students are uniformly prepared for Precalculus and subsequent coursework. The significance of results in pilot sections, compared to non-pilot sections, occurred in spite of the results for non-pilot sections of College Algebra exceeding historical norms. Understanding the potential for improving student knowledge and performance will take time when additional cohorts progress through the new curriculum.

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## Pre-Calculus (MATH 1113) Course Redesign at Georgia Gwinnett College

### Two Simple Course Interventions to Improve DFW Rates in a College Pre-Calculus Course

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Natasha Brewley

This case study provides an example of two simple interventions adopted in a Pre-Calculus course. This was done to keep students motivated and persevering through the semester as well as a way to help them prepare for upcoming examinations in the midst of COVID-19 quarantine. Though these interventions are proposed for an elementary general education Pre-Calculus course, it can be adopted for any course seeing similar effects in their DFW rates due to lack of student motivation and study skills deficiency.

#### STATEMENT OF THE PROBLEM

Pre-Calculus is one of the elementary gateway mathematics courses offered at an open-access institution, Georgia Gwinnett College. Pre-Calculus serves students across various STEM disciplines in the School of Science and Technology at the institution. The pre-requisite to this course is College Algebra and upon successful completion, students are able to continue their study and start their Calculus course sequence. Traditionally, this course along with College Algebra have seen very high DFW rates among students. With continued efforts across the University System of Georgia to shift these outcomes, there are many initiatives currently in place for implementing change. In Fall 2018, the overall DFW rate for Precalculus was at about 35% and in Spring 2019, the overall percentage of students from 16 sections of this course that fell in this category of either DFW or FN were at 34%. The comparison of these rates across sections of Pre-Calculus is done every semester by reviewing assessment data. There is a need for more thorough analysis and investigation by the faculty to understand the data and the reasons causing these outcomes. Student grades in this course vary greatly depending upon course delivery and how instructors opt to give credit for various classroom activities such as homework, quizzes and exams. In additions, course grades also are affected by students' overall course load and personal responsibilities. Student course evaluations and work samples are yet to be compared for this gateway course at the discipline level. But the faculty assessment has brought to light two reasons that have been resounding over the past years as contributing to these high DFW rates. First reason is attributed to students' loss of motivation to continue learning and persevering as the semester progresses and the second reason is the lack of basic study skills when it comes to exam preparation. The current redesign focuses on alleviating the effects of these two elements on student success by introducing timely interventions such as weekly check-ins to sustain student motivation and mandatory test reviews for credit to improve students' preparation for examinations.

#### METHODS

Students' success in Precalculus is critical as this sometimes deters students from further pursuing their study in the STEM disciplines. Two factors resounding among various sections of the course as contributing to a high DFW rate are students' lack of motivation to continue learning and persevering as

the semester progresses and their lack of basic study skills when it comes to exam preparation. In order to alleviate the effects of these factors, this redesign takes the simple approach of introducing two timely interventions: (1) Weekly check-ins and/or motivators to help sustain student interest in the course and (2) Requiring mandatory reviews for all exams conducted in the course.

#### Weekly Check-ins and Motivators

One-on-one check-ins between the instructor and students allow students to be held accountable for the work that was completed in the course as well as assignments that should be prioritized and submitted. Instructors met with students individually at the end of the week while other students did in-class assignments to make sure that students were on track with their work. Instructors reviewed for the completion of assignments that the students had to turn in via the LMS and if there were any missing, gave them a timeline for completion. This also gave the student one-on-one time with that instructor during class to ask quick clarifying questions about anything the students wanted to discuss during that time. For some instructors, this was coupled with weekly motivators including either the class watching a short video followed by a quick in-class discussion or motivational prompts in discussion boards on the LMS that students respond to individually.

#### Mandatory Exam Reviews

Another important intervention implemented during the semester that we believe helped students was requiring them to complete mandatory assigned exam reviews for a percentage of their exam grades. The mandatory review was open book and to be completed in class with one other student. We believed that by students interacting one-on-one with their peers, it forced discussion and review of concepts that may have needed further clarity. We had students work in pairs which also allowed for engagement such as peer-teaching. Scholars such as Goodlad and Hirst (1989) and Topping (1998) suggest that some of the benefits of the peer teaching are as follows: Students receive more time for individualized learning; Direct interaction between students promotes active learning; Students feel more comfortable and open when interacting with a peer; Peers and students share a similar discourse, allowing for greater understanding. Further, one student with more knowledge on a particular content area in the course can support another that did not fully understand the concept to reinforce learning. Before COVID-19, mandatory assigned exam reviews were completed by students in class and graded for immediate feedback by faculty. Concept areas requiring further attention by students were identified so that students could address weak spots before the exam. Once classes moved to an online format due to COVID-19, mandatory exam review problems were still assigned, but submitted via LMS and students were given feedback through that system. Due to students varying situations outside the classroom during this time, some students turned the assignments in while others were unable to due to a lack of technology access outside the classroom.

## OUTCOMES

In Fall 2019, this course redesign had a very different perspective in improving student success in this class. It was focused highly on student performance by providing opportunities for tutoring outside of class to encourage students to ask questions and help their learning process. Four instructors took part in this first round of piloting the course and each provided time (2 hours per week / instructor) when students from any of the sections could walk in to clarify their doubts and obtain points (10%) of their final grade. Despite offering a grade for attendance, only a handful of students made use of this opportunity and student attendance dwindled as the semester progressed. GGC caters to a large commuter population of students many of whom are non-traditional and have only have a fixed number

of hours they can afford or able to be on campus. This affected largely to what extent students could take advantage of services most beneficial to them. The redesign was therefore revamped and took a simpler approach by introducing two timely interventions during class time. First the weekly check-ins to help sustain student motivation coupled with a weekday motivator (started after COVID-19) and second were mandatory exam reviews. During the fall semester both instructors had a large percentage of highly motivated students. Not many needed reminders during check-ins about keeping up with their assignments. But to ensure that this trend stayed a weekday motivator was introduced. This included either broaching an inspirational topic and having a short discussion in class or having the class watch a quick inspirational YouTube video followed by an in-class discussion. These short discussions helped to clear students minds and refocus their energies to something positive. This was a great way to start or end a class/week. After COVID-19 (during the quarantine period) this intervention had to take on a new format. The weekly check-ins were more frequent and via an app called GroupMe. They were not all individual check-ins as much as check-in with the whole class. These really helped to reassure the student that they were in a space that was supportive and focused on their success and was not setting them up for failure. The weekly motivators now were Monday motivators and were a discussion post on the student learning management system. Students were presented with a quote and had to respond as to why they liked it and state an example from personal experience. This accounted for their attendance grade (5%) in class. Instead of the mandatory tutoring sessions, students had to complete exam reviews in class. They were open book and students could collaborate in groups of two. Their work was graded while in class. This worked as a great just in time review facilitated by peer collaboration. This account for 25% of their exam grade. This ensured that students were caught up to speed in case they missed any lectures. These collaborations in the classroom also helped to improve the classroom environment by building a sense of community.

## PLANS FOR CONTINUATION AND EXPANSION

The feedback received from this past semester was more qualitative, and due to the unexpected and unusual circumstances, may be an outlier to be used in the study. This will be implemented again in the Fall semester in two sections of Precalculus with the current online platforms used for course delivery to further understand the effects of these simple interventions on student performance. We will also look for potential sections where these interventions can be implemented this Fall 2020. This summer will be used to designing feedback survey for the course to obtain the necessary data. With the current situation due to COVID-19 it is now furthermore necessary to have the various resources for this course in a more user-friendly platform and streamlined for easy access and delivery in an online environment. The chairs of this committee will be working on this during the summer 2020 semester.

## LESSONS LEARNED AND POTENTIAL IMPLICATIONS

One of the important lessons to take away is that instructors need to be quick to grasp overall motivation index in the class and to make class expectations clear. Instructors also need to adapt to an online environment if instruction delivery has to change. Like other courses in the present circumstance of COVID-19 it is important that the course material be adaptable for both in class and online delivery.

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# Calculus 1 (MATH 1220) Course Redesign at Western Michigan University

## Instructor Collaboration in Calculus 1 to Improve Student Retention and Progression

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Melinda Koelling

Daniela Hernandez

At Western Michigan University, Calculus 1 (MATH 1220) had low student success rates. After issues were identified, a team of instructors was assigned to collaboratively coordinate the course. In this case study, we describe the evolution of the coordination, effects on instructors of this course, effects on student success in this course, and effects on other courses. Changes implemented make access to calculus education more equitable.

### STATEMENT OF THE PROBLEM

In MATH 1220 at Western Michigan University (WMU), local data revealed a steady decline in student success rates from 67% in 2005 to 48% in 2014. Since many of the MATH 1220 students use this course for the calculus requirement in their STEM major, success rates affect majors in multiple departments. In a cross-disciplinary committee, multiple areas of opportunity were identified. In this case study, we discuss how implementing a coordinated approach to teaching calculus addressed the following issues.

Issue 1: Students are not equally prepared for calculus. Students could place into the course by ACT/SAT score, by departmental placement test score, or by completing a prerequisite course at WMU or elsewhere. In addition, some students had weaker preparation because they had longer time between satisfying the prerequisite and taking calculus. Some students needed remediation.

Issue 2: The course could better prepare students for subsequent courses. Anecdotal evidence from partner disciplines suggested that some students struggled to use their calculus knowledge in subsequent courses.

Issue 3: Student success rates (nearly 50% of students who started the class) were discouragingly low.

Issue 4: When disaggregated by instructor, data showed high variability in success rates. Some aspects of the course were uniform (text, topics list, contact hours); however, instructors had great flexibility in the course they delivered. Instructor choices impacted the student skills and the nature of student understanding; what the students had mastered in turn influenced the effectiveness of the course as a prerequisite for subsequent math and science courses. Variations resulted in different learning environments which could unintentionally create inequities for students both in MATH 1220 and in subsequent courses.

### METHODS

A team of instructors was assigned to coordinate elements of the course to address these issues. This instructional team began planning collaboratively the semester prior to implementing the course coordination. The following common elements were developed by the team:

- Common student learning outcomes
- Common grading scale and grading scheme
- Inclusion of low-stakes assessments in grading scheme
- Pacing
- Order of topics
- Two common midterm exams and one common final with common rubrics
- Two mastery tests to assess and improve computational skills, one for prerequisites and another for limits and derivatives
- Similar lesson plans for the first few days of class to ease student transitions between sections
- Self-remediation of algebra and precalculus content using ALEKS

To address issue 1 (unequal preparation), the initial team incorporated the online program ALEKS. During the first few weeks of the semester students were required to use ALEKS to complete an initial assessment on prerequisite skills to determine opportunities for improvement. The implementation of ALEKS allowed instructors to focus on calculus concepts while students could use the tool to self-remediate prior content. To motivate the students to remediate, a first mastery test was given in ALEKS on prerequisite material. In subsequent semesters, students were also provided with “just-in-time” remediation of their algebra and trigonometry skills in ALEKS.

To address issue 2 (student preparation for subsequent courses), issue 3 (student success rates) and issue 4 (high variability of success across sections), the teaching team has been meeting at least once per week to discuss instructional issues and instructional methods, exams, and rubrics during the semester. For example, two mastery tests were developed. The instructional team discussed the skills most important for the calculus sequence, both from precalculus and calculus 1. The first mastery test was designed to ensure that students remediated algebra and trigonometry skills, and the second mastery test was designed to ensure that students became proficient with limits and derivatives. For each mastery test a score of at least 75% was required for passing, with a maximum of three attempts allowed. In addition, the team created and incorporated active learning materials to introduce key concepts (first day activity on functions,  $\epsilon$ - $\delta$  definition of limit, limit definition of derivative, Riemann sum approximation of integral).

Two faculty members agreed to serve as co-coordinators and to teach the course every semester for three years. The co-coordinators have been leading the teaching teams. The teams use the Deming Cycle (Plan-Do-Study-Act) to improve the outcomes of the course (Bryk, Gomez, & Grunow, 2010). At the start of each semester, the team discusses common elements. During the semester, the team enacts these elements, writes additional materials, and examines student progress. At the end of the semester, the team discusses the effectiveness of the approach. For the following semester, the next team incorporates effective elements and designs (or revises) elements to address known issues.

The chair prioritizes selection of instructors for the course: each semester, team members are chosen to maintain instructional consistency and to bring new skills to the team. With every introduction of a new member, careful communication and negotiation of common elements allowed for the continuation of a coordinated approach. The development of common examinations and rubrics by the entire team provided key insights into instructor beliefs and behaviors and helped provide a more equitable learning environment for students.

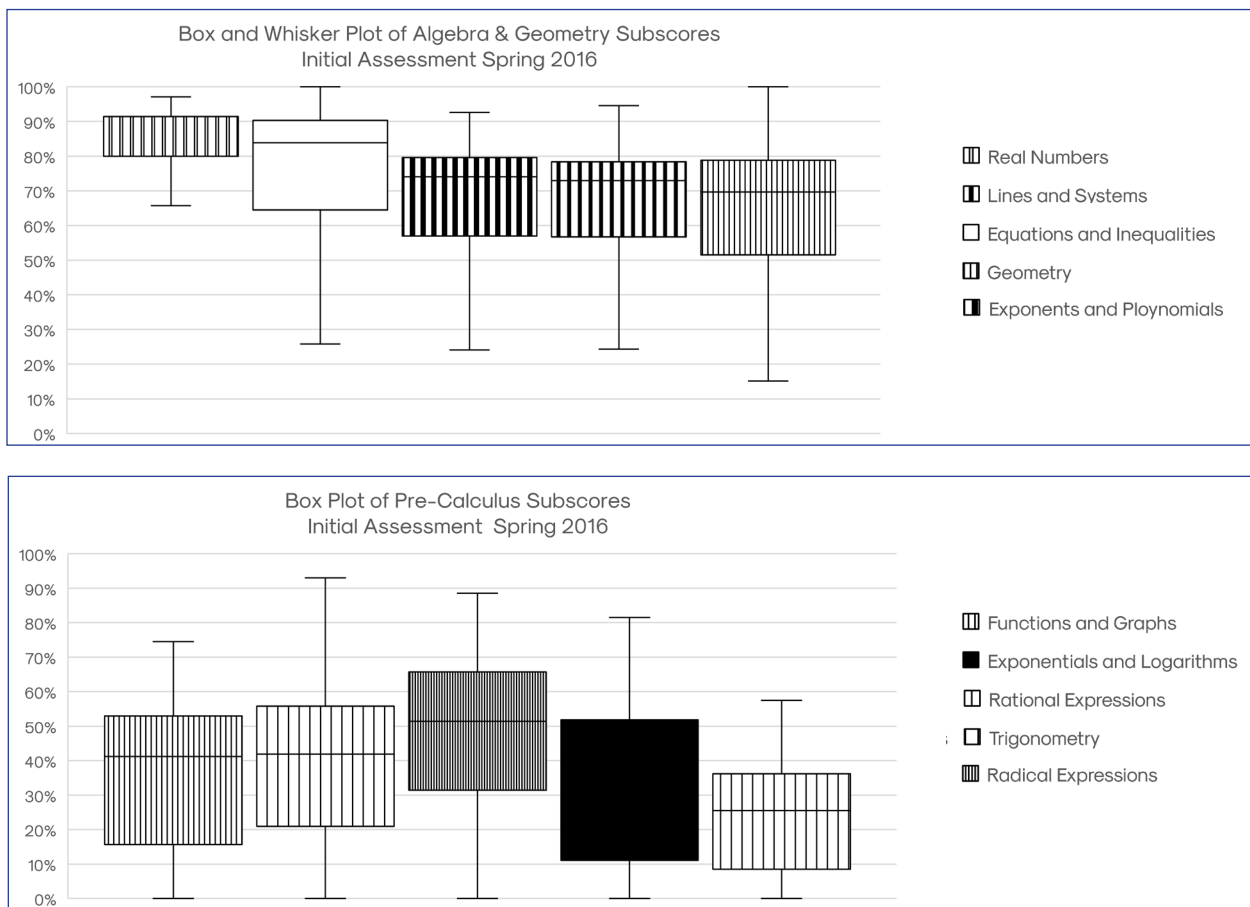
In addition, most sections are assigned an undergraduate learning assistant. A learning assistant is a student who excelled in the course and demonstrated potential for co-learning. Throughout the semester, these students are provided with pedagogical training by the Student Success Services and their section’s instructor. The learning assistant attends class daily and assists students in group-work activities. Outside of class, the learning assistant works with the course instructor to identify gaps in students’ conceptual understanding and skill-based procedures. Together instructor and learning assistant develop strategies and activities to implement in the learning assistant’s out-of-class help sessions and weekly email reminders/summaries.

## OUTCOMES

### Student Prerequisite Preparation

The initial team verified the lack of student readiness. Student readiness in each of ten subject areas is shown in Figure 1. The ten areas can be roughly separated into two categories: “algebra & geometry” and “precalculus.” The student scores in the precalculus category were noticeably lower and more varied than those in the algebra & geometry category. In all precalculus areas, the median score is below 52%.

**Figure 1**  
Box Plots of Prerequisite Content Area Scores By Student



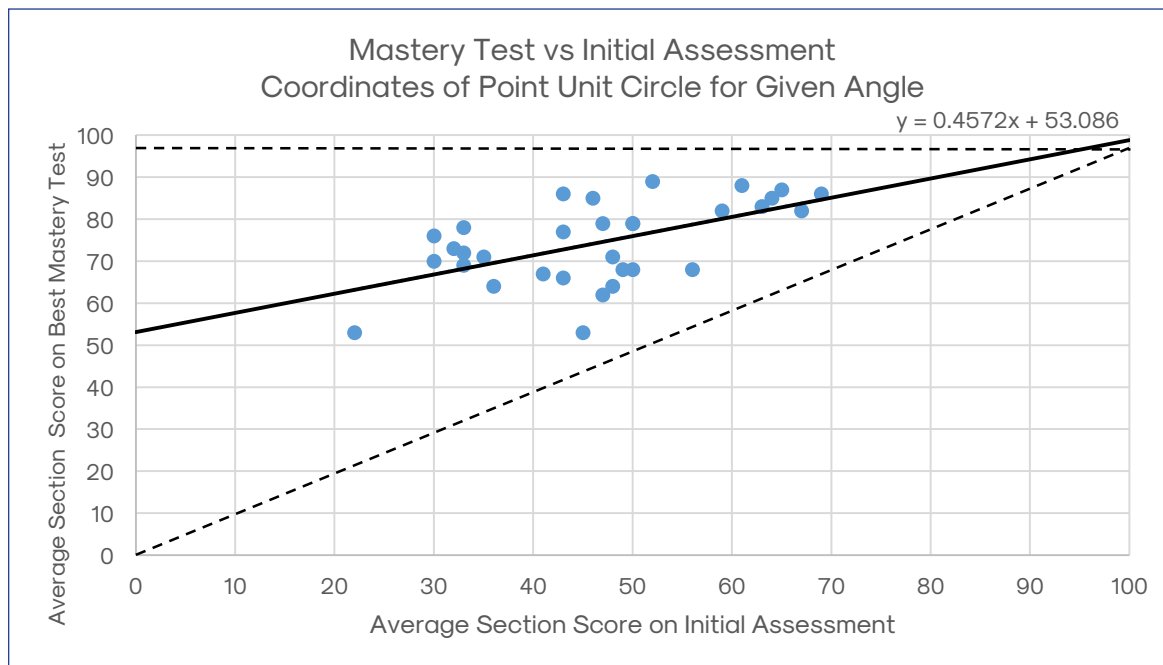
Student scores in algebra and geometry (left) are higher than in precalculus (right). In all areas, many students are underprepared, and there is high variability among students.

The students made progress with their prerequisite knowledge. We consider trigonometry, an especially weak area, as an example. In Figure 2, section averages are shown for three trigonometry topics (unit circle, right triangles, solving trigonometric equations) on the initial assessment and on the mastery test (best score) for all sections from Fall 2016 to Spring 2019. If section average performance stayed constant, then the best fit line would be  $y=x$ . In fact, all data shows that section performance increased from the initial assessment to the mastery test. This can be visualized by seeing how far each data point is above the line  $y=x$ . If all students mastered the topic, the best fit line would be  $y=100$ . This can be visualized by seeing how far each data point is below the line  $y=100$ . In fact, no section had 100% mastery of these topics. However, the students did increase their computational skills and understanding of prerequisite material.

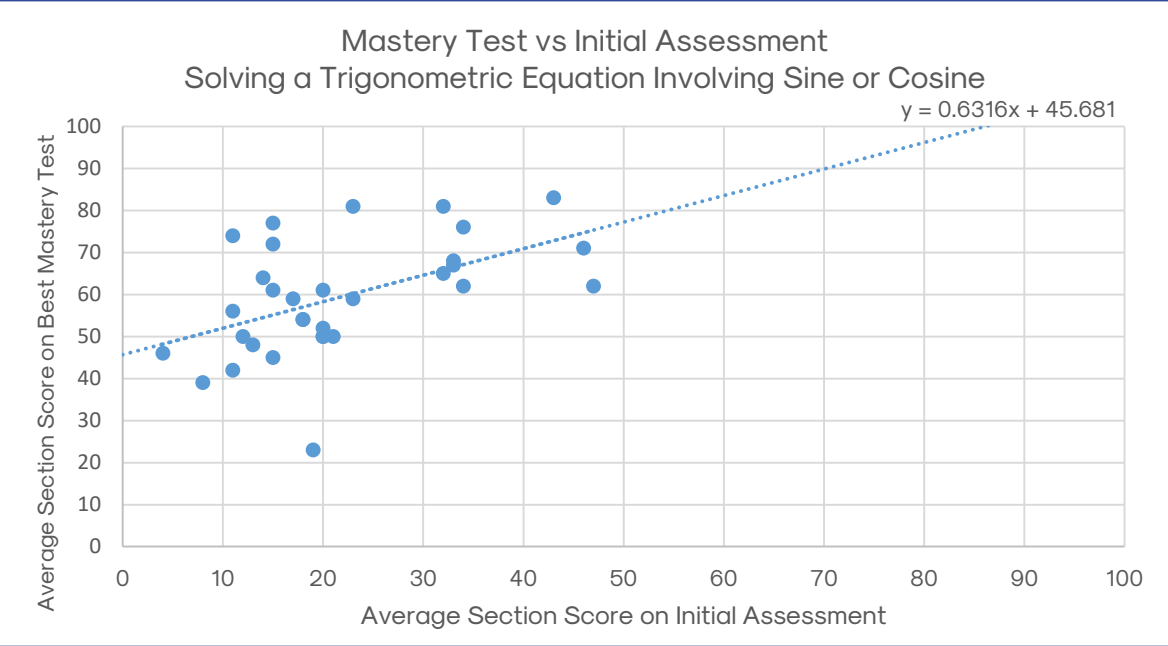
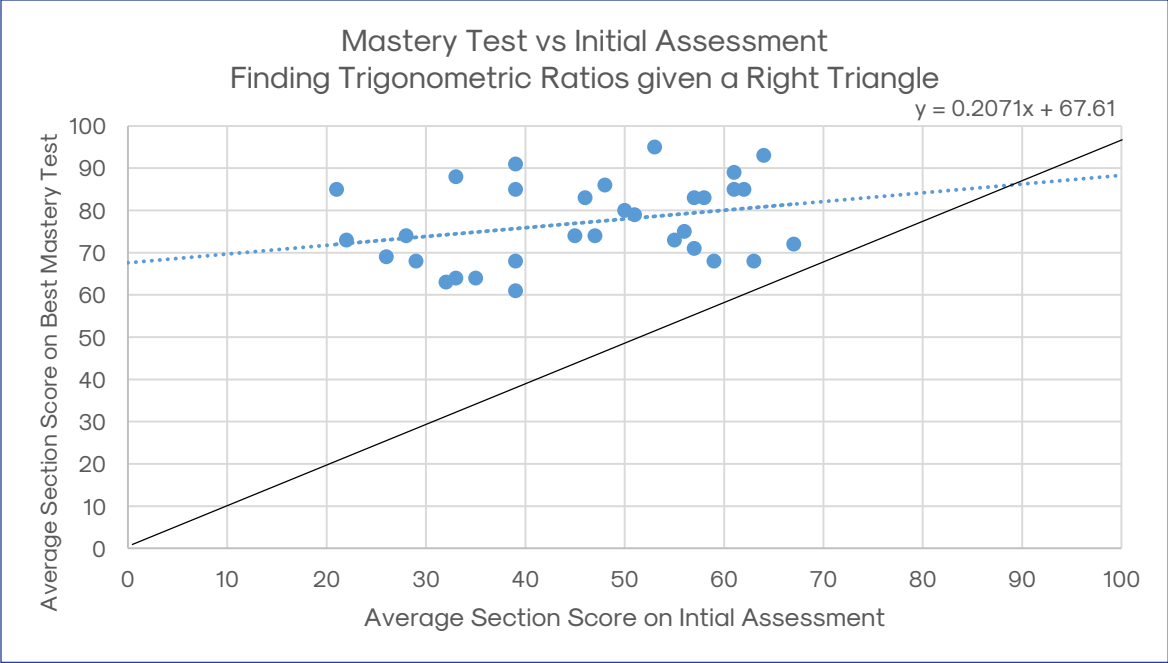
Figure 2. Scatter plot of section averages of initial assessment scores vs. best mastery scores for all sections between Fall 2016 and Spring 2019 for three trigonometric problems: coordinates of points on unit circle (top), trigonometric ratios in a right triangle (middle), and solving trigonometric equations involving sine or cosine in an interval (bottom). Each point represents a single section. The solid line is the linear regression line. Since all data points are between the dashed lines ( $y=x$  and  $y=100$ ), section average scores improved from initial assessment to mastery test, but no section achieved complete mastery.

**Figure 2**

*Scatter Plot of Section Averages of Initial Assessment Scores vs. Best Mastery Scores for All Sections Between Fall 2016 and Spring 2019 for Three Trigonometric Problems*





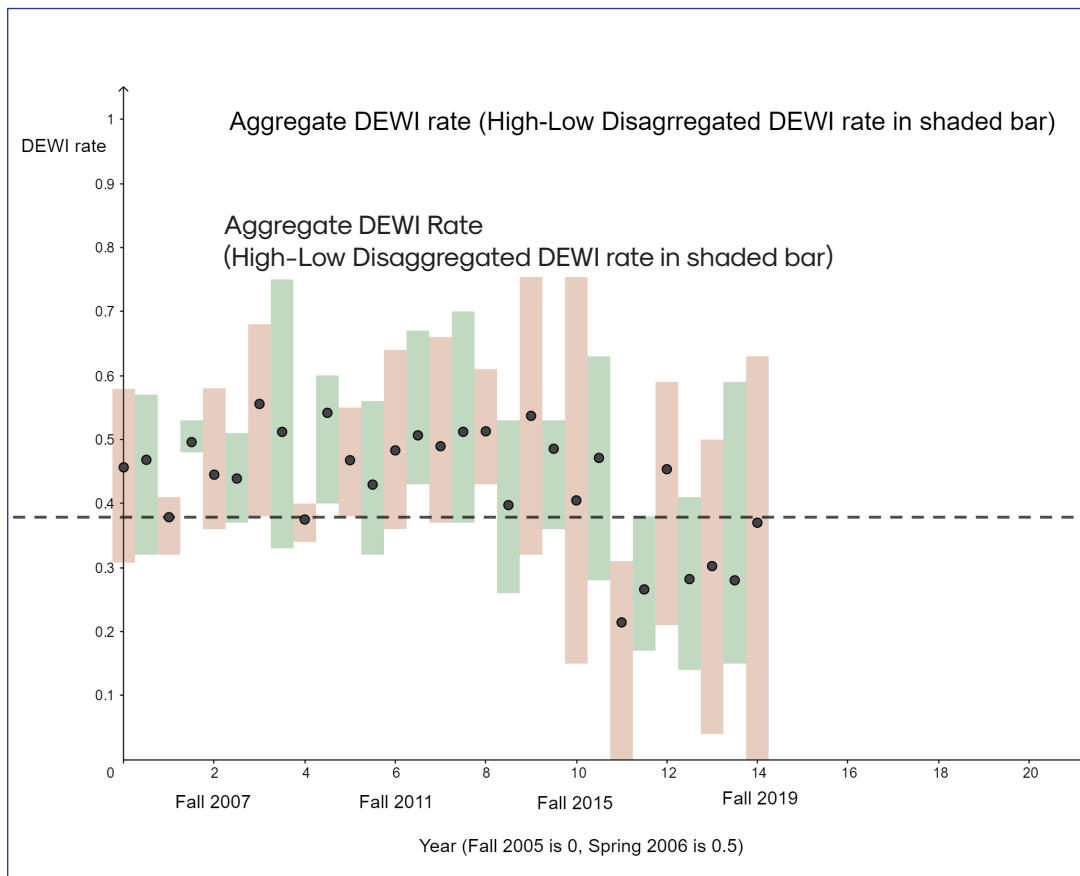


### Student Success

The DEWI rate has improved. The DEWI rate for fall and spring semesters is shown in Figure 3. In most semesters since the redesign, the DEWI rate is lower than the lowest aggregate DEWI rate from the pre-coordination semesters.

**Figure 3**

*DEWI Rates for Each Fall or Spring Semester Between Fall 2005-Fall 2019*



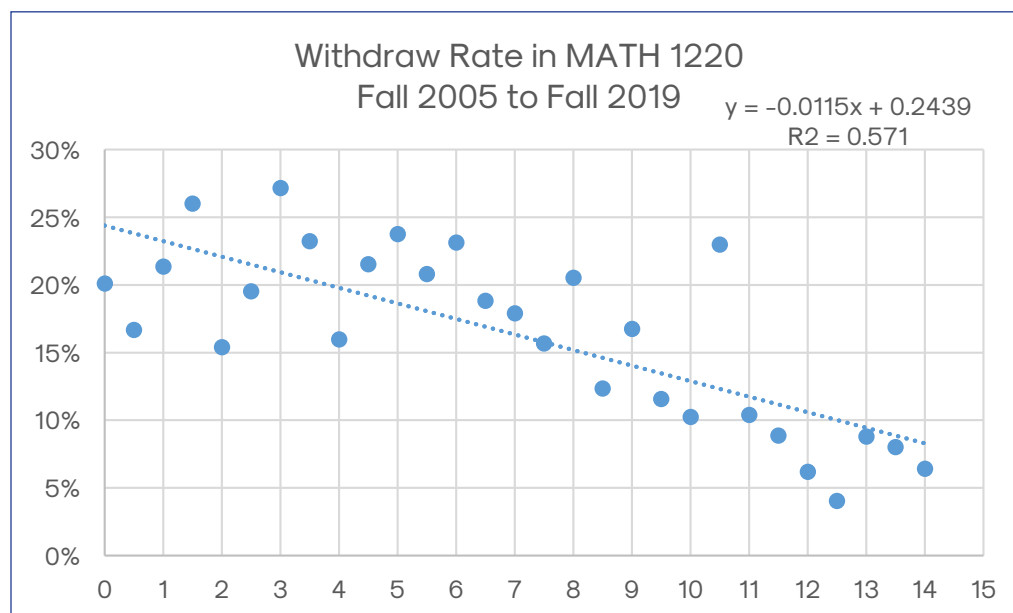
For each semester, the aggregate DEWI rates is depicted by a dot and the shaded bar shows spread across sections. Time is measured since Fall 2005: Fall 2005 is 0 and Spring 2006 is 0.5, etc. Course redesign began in year 10.5. The dotted horizontal line is the lowest aggregate DEWI rate from the pre-coordination semesters. In most semesters since the redesign, the aggregate DEWI rate has been lower than the lowest aggregate DEWI rate from before the redesign, but the variability between sections remains large. Adapted from “A Collaborative Approach to Coordinating Calculus 1 to Improve Student Outcomes” by Mingus and Koelling (2020).

While the homogeneity across sections has improved from an instructional perspective, the variability in the progression rates has not diminished significantly. Some heterogeneity is expected due to factors beyond the instructor’s or team’s control (e.g. student cohorts, Honors College sections). Other sources of heterogeneity remain to be studied to determine if there is an underlying equity issue that should be addressed.

Although the withdraw rate prior to redesign was declining and has continued to decrease overall, the withdraw rate spiked during the first semester of the redesign as shown in Figure 4. This spike may be attributed to the timing of the initial assessment. During subsequent semesters, the team moved the

**Figure 4**

*Aggregate Withdrawal Rates from Fall 2005 Semester to Spring 2019 Semester*



Time is measured since Fall 2005: Fall 2005 is 0 and Spring 2006 is 0.5, etc. Course redesign began in year 10.5. Withdraw rates were declining before the redesign and continued to decline after the redesign. Adapted from “A Collaborative Approach to Coordinating Calculus 1 to Improve Student Outcomes” by T. Mingus and M. Koelling (2020).

## CONTINUATION AND EXPANSION

### Continuation in MATH 1220

The teaching team for MATH 1220 continues to coordinate, revise materials, and address new challenges, and the chair continues to assign a teaching team. The team has transitioned from using ALEKS for remediation to using WebAssign, and remediation methods will continue to evolve as the technology available and placement mechanisms change. The team has transitioned through three textbooks and will continue to evolve as student use of texts and online resources evolve. These adaptations have increased as the team has shifted learning from a face to face environment to online modalities in response to the COVID-19 pandemic.

### Expansion into Other Courses

There has been an expansion of coordination. Since multi-section courses taught by faculty do not have a tradition of close coordination, the coordination of MATH 1220 was novel. Since similar issues to those in MATH 1220 were observed in MATH 1180 (precalculus) and MATH 1230 (calculus 2), features of this coordination were expanded into those courses through the efforts of original MATH 1220 team members.

In Spring 2018, precalculus was converted from a large lecture setting with multiple recitations to a multi-section course with a coordinator. This was enacted to better prepare students for calculus, accommodate a student-centered environment, and facilitate a more uniform approach and collaboration throughout all sections.

Since Spring 2018, there has been a deliberate and organized effort to increase collaboration among all precalculus instructors. The precalculus teaching team established a common set of goals for the course, course schedule for covering the topics, grading scheme and similar grading items. Weekly meetings were conducted throughout the semester: the team discussed a variety of teaching techniques and strategies for improving student success. These discussions centered on methods to improve student's conceptual understanding and ability for practical application. The team also developed uniform exams, quizzes and worksheets for all sections that balanced conceptual understanding and procedural fluency to prepare the students for calculus. There were also common grading rubrics for quizzes and exams.

There was a semester of increased coordination of MATH 1230 (second semester calculus). The instructors met on a weekly basis to discuss goals and instructional issues, and some instructors worked with learning assistants. A group of the MATH 1230 instructors worked closely together creating transparent writing assignments for the content to follow those in MATH 1220, and these assignments have been used by some faculty in later semesters.

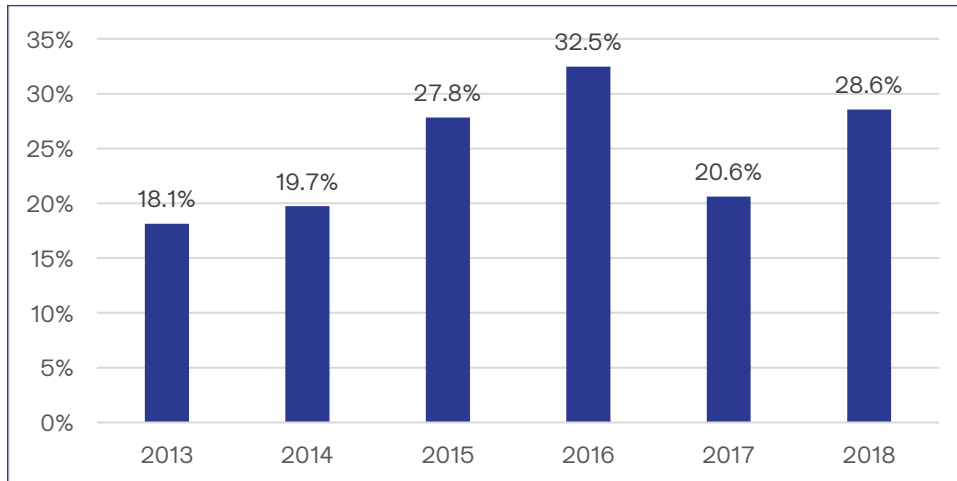
#### **Impact on Progression through Calculus Sequence**

Changes in MATH 1220 affect subsequent courses. The following analysis looks at student progression from MATH 1220, taken in a fall semester, to MATH 1230 in the subsequent spring semester. We study cumulative progression eligibility percent (CPE), the percent of students who earned a grade in MATH 1220 that achieve a grade in MATH 1230 that makes them eligible for MATH 2720 (vector calculus). This analysis begins with the 2013-2014 academic year and ends with 2018-2019. Figure 5 (top) shows the CPE. These percentages are relatively stable and show a slight upward trend. The best CPE occurred in the academic year 2016-2017 when the initial collaborative teaching team that had taught together in Spring 2016 continued working together for the next academic year. The dip in the CPE occurred in the 2017-2018 academic year, the first semester new members were incorporated into the team. The process of reconciling standards and renegotiating norms resulted in a lack of timely communication of instructor expectations to the students. Mechanisms to improve this communication between the students and instructors were created and implemented in the subsequent academic year. The CPE rebounded in the 2018-2019 academic year.

Figure 5 shows details of student progression. The percent of students who earned a grade in MATH 1220 is shown in the first row. The percent of students eligible to take MATH 1230 is shown in the second row. The percentage of students who earned a grade in MATH 1230 is shown in the third row. About  $\frac{1}{5}$  to  $\frac{1}{3}$  of students in MATH 1220 have majors that do not require MATH 1230. Thus, there is a natural decline in the number of students in the second semesters of calculus, so we expect a smaller percentage of students eligible for MATH 1230 actually completing it because many do not take the course. The percentage of students eligible to take MATH 2720 is shown in the fourth row. Combining these percentages, the CPE shown in the fifth row is obtained.

To study if the decreased DEWI rates were a result of degradation of course standards, we can look at these progression rates. The rates have not changed significantly. The CPE has trended slightly upward overall. This suggests that students are adequately prepared for the subsequent course, and the standards have been maintained.

**Figure 5**  
*Cumulative Percent Eligibility for 2720 AY 2013-2014 to 2018-2019*



	Academic Year					
	2013	2014	2015	2016	2017	2018
<b>Earned Grade in 1220</b>	82.4%	82.8%	89.8%	89.6%	93.8%	92.3%
<b>Eligible for 1230</b>	66.7%	56.0%	66.3%	87.7%	58.2%	75.6%
<b>Earn Grade in 1230</b>	56.6%	53.2%	56.6%	60.3%	54.7%	49.6%
<b>Eligible for 2720</b>	58.3%	80.0%	82.6%	68.5%	69.0%	82.5%
<b>Cumulative Eligibility for 2720</b>	18.1%	19.7%	27.8%	32.5%	20.6%	28.6%

Figure 5 illustrates the cumulative percent eligibility (CPE) for MATH 2720 of those students who earned a grade in MATH 1220 (top) and details of CPE computation (bottom). CPE is computed by multiplying fractions of students who complete MATH 1220, of students who are eligible for MATH 1230, of students who earn a grade in MATH 1230, and of students who are eligible for MATH 2720. The fraction of students who earn a grade in MATH 1230 is low as expected, some students are not required to take MATH 1230. CPE has not dropped, suggesting standards were not lowered in course redesign.

## COORDINATION AND INSTRUCTOR DEVELOPMENT

Coordination and communication about course priorities and expectations among instructors has created a more equitable learning environment for the students. The process of creating common assessments has helped faculty articulate their course goals and their expectations regarding student performance. Once these are articulated, instructors can communicate them to their students. Early and frequent communication of expectations is especially important for at-risk students who may have less academic capital than their peers and require more supportive educational environments.

## LESSONS LEARNED AND POTENTIAL IMPLICATIONS

Issue 1 (student preparation): We have been able to help students acknowledge gaps in their preparation. Mastery tests have given the students a goal: learn the foundational material to pass the test. Just-in-time homework assignments are useful for some students. Using the complete remediation path available from ALEKS proved to require too much time for most students. Future work could involve helping students find more time efficient ways to remediate core prerequisite knowledge.

Issue 2 (student preparation for subsequent courses): We have been able to prepare our students to succeed in subsequent math courses at similar rates as before the redesign. Future work could include learning how to efficiently measure and track student success in subsequent math courses and tracking their progress through courses in partner disciplines.

Issue 3 (student success rates): We have been able to increase success rates and maintain the percentage of students successfully completing subsequent math courses. Further study is required to understand how high we can make the success rates in MATH 1220 without sacrificing student preparation for future courses or making the time commitment required for faculty onerous.

Issue 4 (variability of success rates across sections): Despite our attempts to provide an equitable learning environment for students of all sections through coordination of key class features, the coordination was not sufficient to decrease variability in class success rates.

### **Further Lessons about Coordination**

Coordination by consensus is a continuous process that takes work to maintain. It is time consuming and requires active collaboration by team members. The department chair is essential in the assignment of team members who are willing to collaborate. With the addition of team members, the coordination must be renegotiated so that the new members can understand and embrace the collaboration. Ideally, members would share their own ideas and materials, understand the ideas and materials of others, improve the materials that are to be used, and apply the developed materials.

The work of developing common course priorities and expectations is messy. Teaching involves many choices, and instructors have different experiences and preferences they bring to the team. In addition, changes in textbook, text usage, homework systems, and/or content delivery add more variability. Changes force the team's expectations to evolve. Evolution does not always work perfectly. During semesters where multiple changes occur or communication is hampered, expectations are difficult to establish in a timely fashion. Transparency of objectives to instructors does not automatically yield transparency to students. As a result, communication to students is delayed making it more difficult for students to meet the newly formulated expectations. This can impact their performance in the class. Assignments and other messaging should help the students understand and accomplish major objectives. As changes are made, messaging to students should adapt as well.

When course priorities and expectations do not match in one semester, increased clarity is possible for future semesters. For example, common writing assignments were designed to make the goals and expectations of the course more transparent to the student (Winkelmes, 2019). The expectations on these assignments were parallel to instructor expectations on exams. Specific types of evidence were elicited from students to help them develop and rehearse their understanding of concepts in a non-high stakes setting. Students were given the opportunity to rewrite these assignments, and this process provided an important communication channel between the student and the instructor. As a result, the instructors could expect better use of evidence and mathematical notation in class and on exams.

Creating common assessments aided the articulation of priorities; this has been helpful as a way to include the ideas of team members. In the future, common assessment writing could be used for other courses and for the department as a whole.

### Summary

Our implementation of collaborative coordination has increased success rates and continued to keep withdraw rates low. It improved the team's effort to prepare students for subsequent STEM courses and address variability in success rates across sections. This is work to tackle in the future.

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<sup>1</sup> Most students must earn at least a grade of C in order to progress. Successful grades are A, BA, B, CB, and C; the success rate is the rate at which these grades are earned. Unsuccessful grades are DC, D, E, W, or I; the non-success rate is the rate at which these grades are earned. The non-success rate is called the DEWI rate.

<sup>2</sup> Assessment and Learning in Knowledge Spaces (ALEKS) has adaptive online tutoring and assessment programs. We used Prep for Calculus with Limits.

<sup>3</sup> The last academic year after the redesign of MATH 1220 that is not impacted by the COVID-19 pandemic.

<sup>4</sup> The percentage of students who earned a grade in a course excludes students who earned an incomplete or withdrew from the course.

<sup>5</sup> The percentages of those eligible to progress to the next course are the number of students eligible to progress divided by the number of students who earned a grade.

# College Algebra (MATH 105) Course Redesign at Eastern Michigan University

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Historically, College Algebra at Eastern Michigan University (EMU) has had high enrollments and high DFWI rates. Hence, College Algebra is designated as a gateway course. In an effort to reduce the DFWI rates across all student demographics while paying particular attention to equitable outcomes, EMU has partnered with the Gardner Institute in the initiative Gateways to Completion. Here, we give a data-driven case study on the G2C College Algebra redesign and outcomes.

## STATEMENT OF THE PROBLEM

College Algebra is labeled as a gateway course because it has high enrollments (approximately 800 per year across 25 sections) and high DFWI rates (approximately 44%). In addition, 148 programs list College Algebra as a component (required, elective or a prerequisite). Thus, the high enrollments coupled with the high DFWI rates have a significant negative impact on the completion rates of a breadth of programs across campus.

The following data reveal that the before-G2C baseline DFWI rates for African American (AA) students are higher than the average of 44%.

- The DFWI rate for African Americans in 2015-2016 was 47%.
- The DFWI rate for African Americans in 2016-2017 was 57%.

Thus, we sought a College Algebra redesign which (1) reduces the DFWI rates across all student demographics and (2) promotes equitable outcomes.

In order to redesign College Algebra so as to attain these two outcomes, the G2C Course Specific



Committee, in winter semester of 2017, undertook an extensive guided analysis of those factors which impact success/failure in College Algebra. The findings of this analysis, together with the combined expertise and experience of the committee members led to seven College-Algebra redesign recommendations.

## METHODS AND OUTCOMES

### **Redesign recommendation #1. Foster a community of College Algebra instructors who are dedicated to improving the course.**

This may be the most important recommendation of them all, since it is the instructors who deliver the content and set the tone in the class. It is their enthusiasm, sincerity, and connections with students (especially under-represented students) that come across loud and clear.

Recommendations 2 through 7 of the Course Specific Committee were implemented according to the following schedule:

- Fall 2017 and Winter 2018, redesign implemented in 7 out of 12 sections.
- Fall 2018 and Winter 2019, redesign implemented in 7 out of 12 sections.
- Fall 2019 and Winter 2020, redesign implemented in 11 out of 11 sections.

We wanted instructors who were excited about implementing the G2C recommendations, so instructor participation was voluntary; this is why we did not, initially, have enough G2C instructors to cover all of the sections of College Algebra.

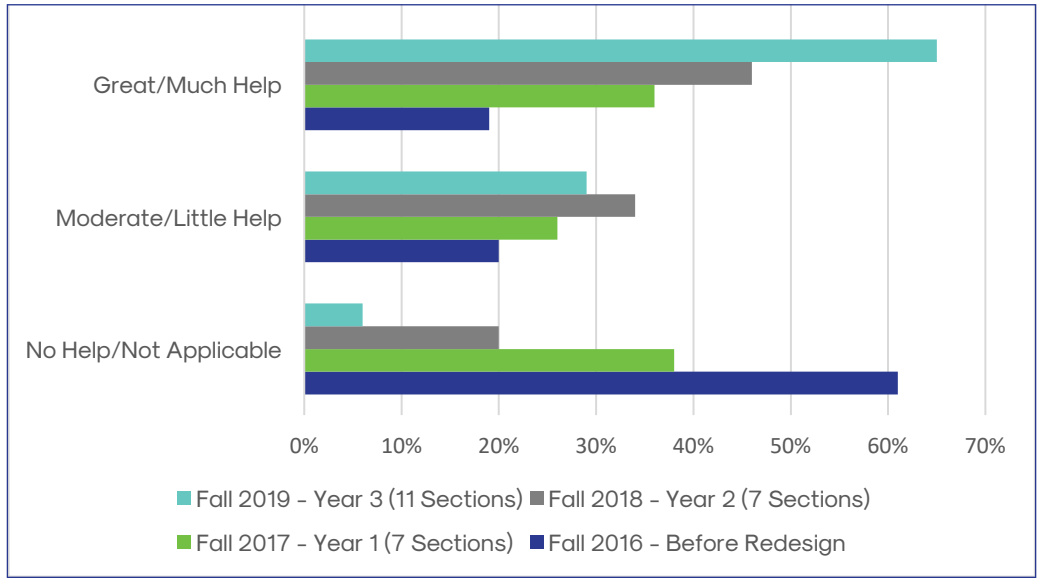
### **Redesign recommendation #2. Employ active learning strategies in the classroom.**

It is important to note that at monthly meetings, the instructors discussed some options for implementing active learning. Ultimately, however, the details of how to implement active learning were left to each individual instructor. The idea was to support instructors while encouraging them to unleash their creativity. Following are a few of the various activities employed by the EMU College Algebra instructors:

- Students work on in-class activity sheets
- Students think, pair and share during class
- Students preview the lesson for the day
- Students complete partial notes
- Students complete exam wrappers

The Student Learning Gains (SLG) Survey was implemented over 4 years and the student responses to the survey item “Doing hands-on class activities was...” are graphed in the chart below. The chart shows the year-after-year improvement. For example, the students responding “great/much help” increased from 19% to 65%. It appears that the implementation of active learning improved over time, possibly due to the instructors’ comfort level with active learning increasing over time.

**Figure 1**  
*“Doing Hands-On Class Activities Was...”*



**Redesign Recommendation #3. Teach students how to study and learn mathematics (metacognition).**

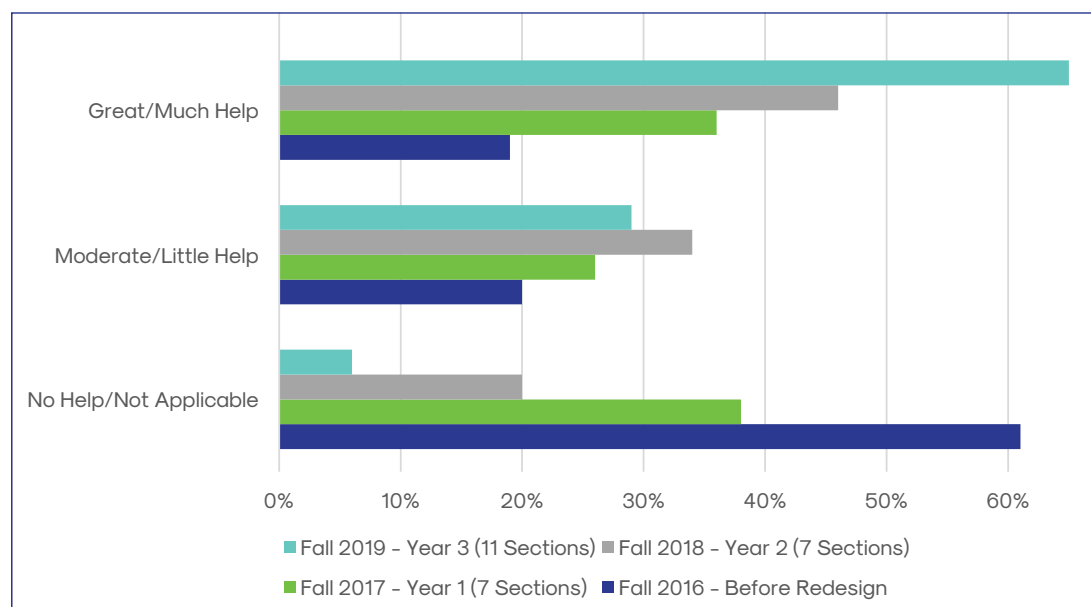
Again, we did not tell the G2C instructors how to incorporate metacognition into their daily lessons. We simply gave them some ideas and materials and encouraged them to be creative. Following are a few of the metacognitive strategies employed by the G2C instructors:

- Instructors express confidence in their students.
- Bloom’s taxonomy
- Growth mindset versus fixed mindset
- Know the goal and how the information is organized
- Active listener versus the passive hearer

The results of the SLG to the item “Explanation given by the instructor of how to learn or study the materials was ...” are graphed below. Again, we see student responses becoming more positive over the 4 years of the survey. Note that active learning and metacognition (recommendations 2 and 3) are key components of an inclusive pedagogy.

**Figure 2**

*“Explanation Given by the Instructor of How to Learn or Study the Materials Was ...”*



**Recommendation #4. Use the online tutorial/homework system MyMathLab.**

MyMathLab has great tutorial help and has been especially helpful to underprepared students. The \$75 cost for MyMathLab and the online textbook is assessed as a course fee. Thus, all necessary materials to succeed in the class are paid for upon registration. This is especially helpful to underprivileged students. Historically, it was not uncommon for financially struggling students to register for a class, not have the funds to purchase the course materials, and as a result, fail the course.

**Recommendation #5. Employ spiraling homework sets which repeatedly spiral back to important concepts and skills from previous lessons.**

Taking ownership of new concepts and skills requires repeated practice over an extended period of time. Employing spiraling homework sets is an attempt to create that repetition over time. The basic idea is that spiraling homework sets repeatedly spiral back to important learning objectives from previous lessons.

**Recommendation #6. Give frequent exams (e.g., 6 per semester).**

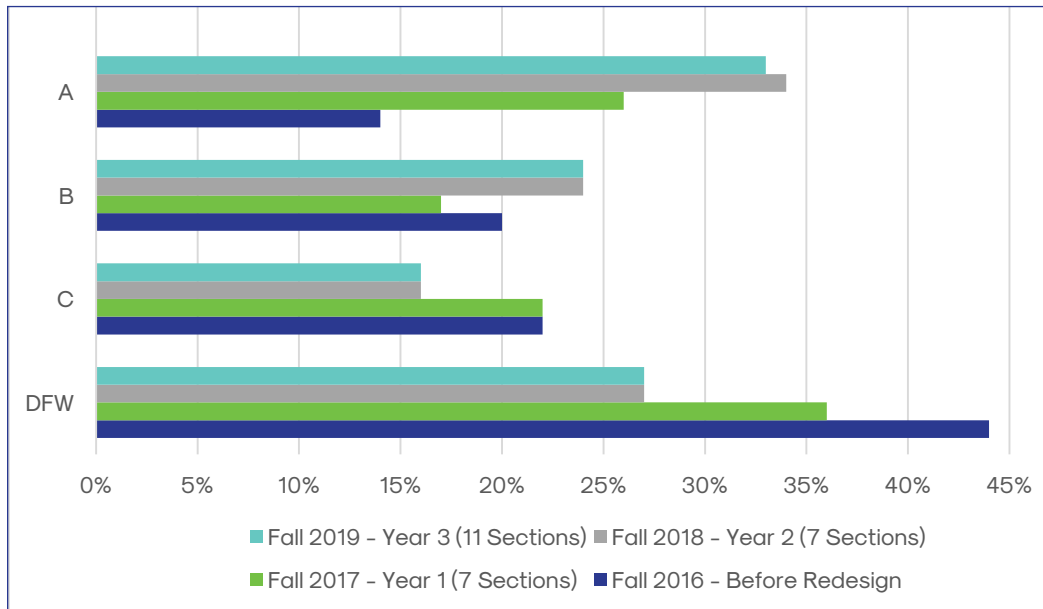
Increasing the number of exams, reduces the amount of content on each exam, thereby making each exam less demanding. In addition, increasing the number of exams increases the frequency with which students receive feedback.

**Recommendation #7. Employ the early alert system Starfish.**

Starfish is a great tool for initializing an outreach to a student, especially a minority student who might not feel connected to the class or the instructor. However, to be meaningful, this outreach must be followed by an intervention such as an office visit.

As the following chart shows, the student grade distributions improved over the three years of the G2C redesign implementations. In particular, the DFWI rate dropped from 44% before the redesign implementations to 27% afterwards. In addition, the percentage of A grades rose from 14% before the redesign to 34% after the redesign.

**Figure 3**  
*Distribution of Course Grades*

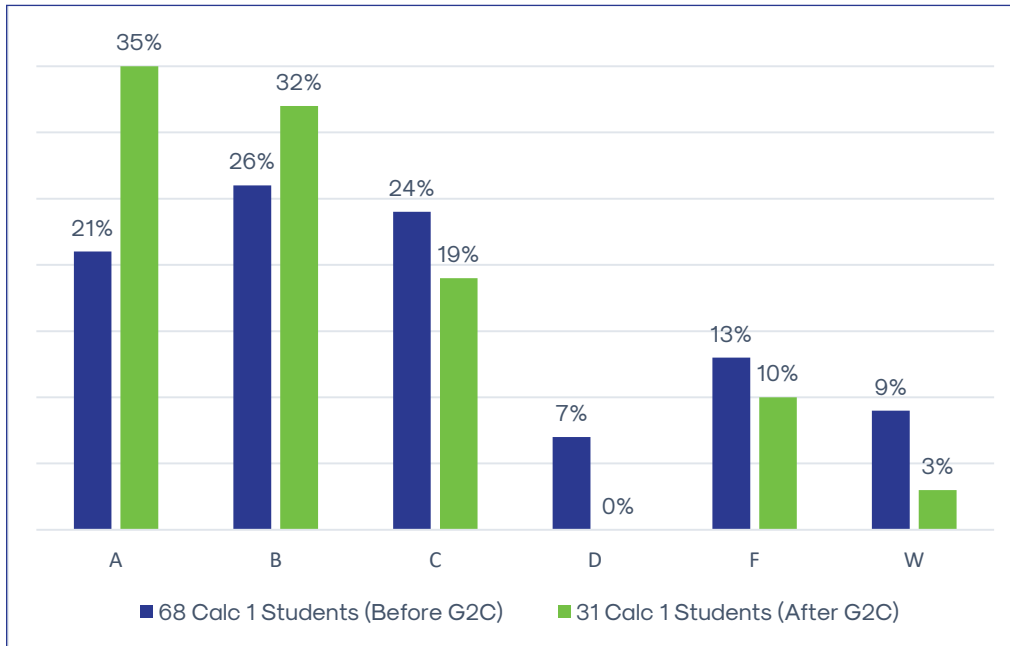


## PLANS FOR CONTINUATION AND EXPANSION

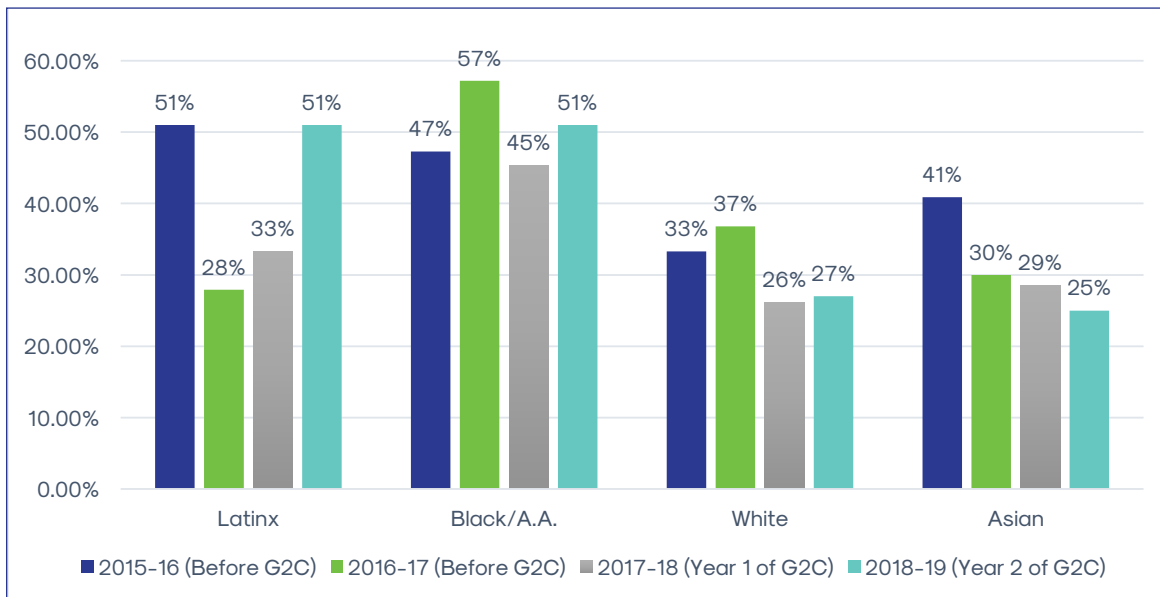
One of the G2C instructors implemented the G2C recommendations in a section of MATH 120 Calculus I. In the chart below, the grade distribution is compared to the grade distribution for two non-G2C sections of Calculus I taught by the same instructor. Note that the grade distribution for the G2C section is significantly better than the grade distribution for the two non-G2C sections. We are encouraged to try the G2C recommendations for other lower-level classes such as:

- MATH 104 Intermediate Algebra
- MATH 107 Trigonometry
- MATH 112 Precalculus
- MATH 122 Introduction to Linear Algebra

**Figure 4**  
Grade Distributions



**Figure 5**  
DFWI Rate by Ethnicity/Race



## LESSONS LEARNED AND POTENTIAL IMPLICATIONS

As the following chart shows, the DFWI rates were lower for the Asian students and the white students during the redesign years than during the years before the redesign. However, for the Latinx students and the African American students, the before-and-after DFWI rates were relatively unchanged.

The above chart incorporates data from the following:

- Fall 2015 – all 12 sections offered – before the G2C redesign
- Fall 2016 – all 12 sections offered – before the G2C redesign
- Fall 2017 – all 12 sections offered, 7 of which were taught by G2C instructors – year 1 of the G2C redesign
- Fall 2018 – all 11 sections offered, 11 of which were taught by G2C instructors – year 2 of the G2C redesign

This chart suggests that we need a shift of emphasis in our pedagogy. While the G2C instructors have implemented recommendations #2 through #7, the impact has not benefited all student demographics. We need a more inclusive pedagogy. Perhaps implementing more peer-to-peer time in the classroom and placing more emphasis on creating an atmosphere in which all students have a sense of belonging would engage under-represented students. We should do the following:

- learn students' names early
- build personal relationships with students by revealing occasional anecdotes about ourselves
- model respect and fair treatment
- include positive comments in response to student questions and comments
- encourage one-to-one office visits
- in general, create a culture of caring

As always, we instructors have the challenge of working in unison toward a common goal while bringing out the best in one another and our students.

## Introduction to Psychology (PSYC 1101) Course Redesign at Middle Georgia State University

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A course redesign of PSYC 1101 to decrease the DFW rate was implemented by two instructors. Traditional lecture format was deemphasized through in-class activities and using an active learning web-based program to provide students with individualized assistance on practice questions and immediate automatic feedback. Results suggested that, although the overall DFW rate was lower after the course redesign, the difference was not statistically significant. Further, students with low high school GPAs and/or lower SAT math scores had lower course grades in redesigned sections. Inspired by this redesign attempt and communication about it, alternative redesign approaches are being developed to deepen student learning.

### STATEMENT OF THE PROBLEM

As part of the Gateways to Completion (G2C) initiative, the course redesign aimed to decrease the DFW rate in Psychology 1101 by attempting to deepen student learning and course material engagement, partly by adopting a lower cost textbook to increase accessibility for low-income students. Based on student performance data from control PSYC 1101 course sections at Middle Georgia State University (MGA), approximately 20% of students earned a grade of D, F, or withdrew (DFW rate) from the class. This base rate varies significantly across course instructors. Because decreased student success is often correlated with low socioeconomic status and ethnicity (e.g., Jury, Smelding, Stephen, et al., 2017), the course redesign also aimed to increase equitable education outcomes across various underperforming groups.

### METHODS

The approach used for the redesign was inspired partly by guiding principles recommended by the National Center for Academic Transformation, including (1) increasing the use of active learning activities, (2) providing students with individualized assistance, and (3) including on-going assessment and prompt (automated) feedback.

Instructors implemented the course redesign using a 3-pronged approach. First, to increase active learning in the classroom, instructors included at least one new activity per unit. Activities came from department faculty input and included such things as student-involved demonstrations (e.g., classical and operant conditioning, memory reconstruction), videos followed by focused class discussion, group activities, and in-class worksheets (e.g., IVs/DVs, defense mechanisms). These activities reduced traditional lecture time by approximately 20%. Both instructors made every effort to keep course content, activities, assignments,

and grade structure as similar as possible while still allowing for academic freedom. Second, to comply with guiding principles 2 and 3 (above), instructors included an active, learner-centered, web-based program associated with the textbook (Learning Curve), which gives students immediate automated feedback and individualized assistance with an extensive number of practice questions. Completion of the Learning Curves, along with other outside assignments, comprised about 20% of the student's grade. Third, a department-wide textbook was adopted so students could get access to a premier textbook in the field along with its online adaptive learning system, for substantially reduced cost. One aim of this was to increase the number of financially insecure students who were able to purchase the textbook and actively engage with it and its associated adaptive learning system. Part of our implementation of this lower-cost text included pioneering first-day/inclusive access at our University.

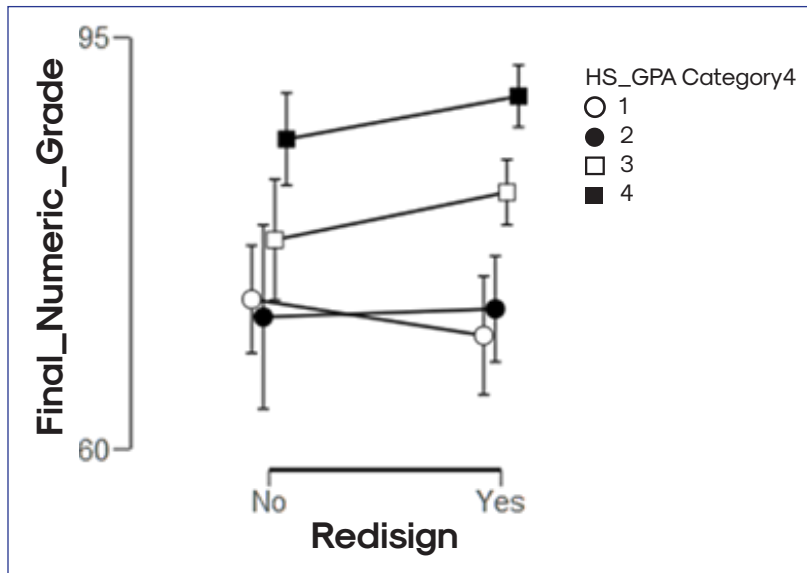
## OUTCOMES

Did the Course Redesign Improve the Overall combined DFW rate before vs. after invention? Combined over multiple semesters and across the two instructors, the overall DFW rate was nearly 5% lower after the redesign (24.7%, N=247) than before the redesign (29.6%, N=274), although the difference in the DFW rate was not statistically significant ( $\chi^2(1)=1.551$ ,  $p=.21$ , N=521), suggesting no evidence that the course redesign was effective. It's important to note that, when compared to the overall DFW rate for students who take the course from other instructors (i.e., non-redesigned sections) in recent semesters (approximately 20%), the DFW rate for the redesigned PSYC 1101 sections is about 5% higher than the non-redesigned sections. Thus, if the intervention had an effect, it wasn't a strong enough effect to reduce the DFW rate for the two instructors to the baseline for the PSYC 1101 sections that did not adopt the course redesign intervention.

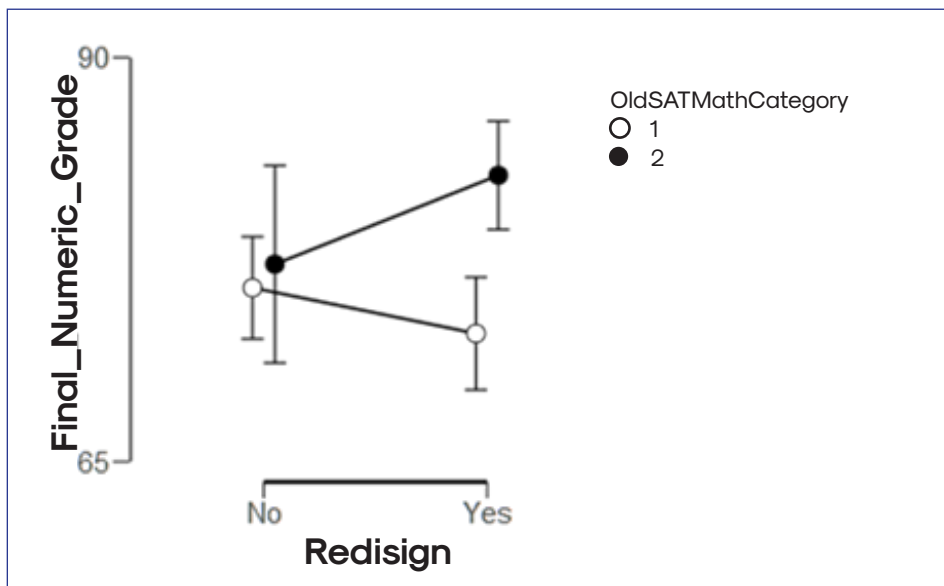
Did the Course Redesign Effort Slightly Harm the Grades of the Most At-Risk Students? Good intentions can sometimes have unanticipated negative effects. We investigated whether there were statistical interactions between (1) students' High School GPAs and the G2C intervention/redesign and (2) between SAT Math scores and the redesign/intervention. The results suggested that the student grades of the Redesign Effort trended in a positive direction for well-prepared students (e.g., high HS GPA), but in a negative direction for the least prepared quarter of students. In other words, among those students with high school GPAs from the lowest quartile (labeled HS GPA category "1" in Figure 1 below), the grades were actually lower if they took a redesigned PSYC 1101 section (compared to taking a section from the same instructor before the redesign effort), though the interaction was not statistically significant (See Figure 3). Similarly, students with below-median SAT math scores (in our sample) had lower PSYC 1101 grades in redesigned sections, whereas the PSYC grades of those with above-median SAT math scores appear to have been significantly increased by the redesign. This interaction was small, but statistically significant ( $F(1,134)=4.055$ ,  $p=.045$ ) (See Figure 2). Thus, since the G2C redesign effort was targeted toward helping students most likely to have been unsuccessful, it appears ineffective in that regard. If anything, the redesign effort might have increased the student achievement gap. It could be that the more "at risk" students were less likely to complete some of the extra assignments meant to help them actively practice thinking about the material, thus, helping the well-prepared students more than the less well-prepared students. Students higher in conscientiousness and/or general cognitive ability might benefit more from some interventions provided equally to all students (Pinker, 2002), thus resulting in an increase rather than a decrease in equitable education outcomes.



**Figure 1**  
*Interaction Between Student High School GPA (Quartiles) and the Course Redesign on Grades*



**Figure 2**  
*Interaction Between Student SAT Math Scores (Using Median Split) and Course Redesign*



## PLANS FOR CONTINUATION AND EXPANSION

Although the G2C (Cohort I) redesign has ended, all PSYC 1101 instructors at MGA have been asked to think carefully about a new teaching approach or change that each would like to make in PSYC 1101 beginning in Fall 2020. Their new approaches will involve different interventions/instruction changes (aimed at deepening learning) based on instructor choice, but outcome data on the DFW rate (and information about the changes made) will be reported at the end of the semester to the Department Chair with the eventual goal of expanding the most successful course redesign techniques to all course instructors. In developing their new approach, all instructors have been provided with some examples/suggestions of interventions that have some empirical support and/or theoretical promise.

Given that original G2C intervention for PSYC 1101 did not evidently have the desired effect of reducing achievement gaps or helping “at-risk” students in particular, the original redesign intervention itself will not be expanded to other instructors. The new modifications will be aimed at “deepening” student learning. The modified focus on getting students to think about the meaning of material allows for maintaining flexibility for instructor choices about specific idiosyncratic methods for deepening student learning. Further, several instructors teaching the course have begun investigating if the use of teaching assistants and tutors might particularly help at-risk students.

## LESSONS LEARNED AND POTENTIAL IMPLICATIONS

Although our G2C course redesign did not result in a significant decrease in DFW rates, there were several lessons learned. The additional practice assignments/activities that were meant to deepen student learning might actually decrease course grades for some students because of the sheer number of assignments (which some students did not do). Alternatively, differences in student personality (e.g., conscientiousness), student college readiness, and general cognitive ability might moderate how beneficial these additional activities and practice opportunities are. We continue to investigate whether at-risk students take full advantage of the opportunities or if the supplemental activities might actually decrease their grades due to noncompletion. We are also considering deploying Undergraduate Teaching Assistants as a resource for at-risk students.

An additional lesson learned is that our current “lower-cost” textbook is slightly above the limit to be designated as “low cost” by the USG/Affordable Learning Georgia initiative. Recent negotiations for a lower cost option from the same publisher should improve access for financially struggling students.

Although we did not present the analysis, we also found out a high DFW rate (37.1%) in 8am class sections of PSYC 1101 (regardless of redesign). Consequently, we no longer offer 8am sections.

The G2C redesign experience and results have been discussed at a newly created Departmental-Behavioral Sciences Colloquium, created to increase communication about research/scholarship in our fields, particularly, scholarship of teaching and learning (SoTL). The increased communication about high impact teaching strategies among PSYC colleagues and mindfulness about student success and progression has been the biggest benefit to the department going forward. In this way, the G2C initiative has been successful at our institution.

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# Introduction to Psychology (PSYC 1101) Course Redesign at the University of North Georgia

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This case study describes an intervention to improve students' metacognition and mastery of course learning objectives. Introductory Psychology students ( $n = 261$ ) were asked to predict their exam scores during each exam. The Experimental Group received a warning lecture about overconfidence. They also received exam wrappers including detailed feedback and prompts to encourage metacognitive reflection. Compared to controls, the Experimental Group showed greater improvement in metacognition; but there was no significant difference in terms of mastery of course learning outcomes. We conclude that the intervention shows promise for improving metacognition but does not automatically lead to improved learning.

## STATEMENT OF THE PROBLEM

A near-universal challenge in classroom settings at every level is helping students develop effective study habits. One factor that appears necessary for effective studying is accurate metacognition. Specifically, students must distinguish when they know something “well enough” to pass an exam, so that they may confidently move on to spend more time on material that is not yet mastered. However, a large body of literature suggests that the students who struggle most are often overconfident prior to learning their grades (e.g., Kruger & Dunning, 1999). In a recent laboratory study that compared the effectiveness of different metacognitive interventions (Saenz et al., 2019), only salient feedback and a motivational warning lecture were found to improve participants ability to predict their own test scores. Our course redesign applied this research to our own classrooms. Thus, our intervention involved using a combination of salient feedback (an exam wrapper which also prompted metacognitive reflection) and a warning lecture in a quasi-experiment which aimed to improve students' metacognition. We hoped that this intervention would also indirectly improve students' mastery of foundational knowledge related to the course content, assuming the hypothesized improvements in metacognition led to improved study habits.

## METHODS

Introductory Psychology students ( $n=261$ ), spanning multiple course sections across five campuses, were asked to predict their exam scores during each exam. The Experimental Group received a warning

lecture about overconfidence at the beginning of the semester. They also received exam wrappers which prompted them to reflect on their over- or under-confidence when they received their exam scores with feedback. The Control Group also predicted their scores, but with no warning lecture or exam wrapper. The groups were compared on two outcomes: 1) improvement in metacognitive calibration from first to last exam; and 2) improvement in foundational knowledge from first to last exam. Improvements in metacognitive calibration were measured by comparing prediction errors on the first exam and last exams. Foundational knowledge was measured using an online quiz consisting of randomly selected questions representing each of our course learning objectives. This quiz was administered twice, once at the beginning and again at the end of the semester, to quantify students' improvement in foundational knowledge.

## OUTCOMES

One question we investigated was whether our students tended to be under- or over-confident during exams. A one-sample t-test showed that students were not systematically under- or over-confident during the first exam,  $t(245) = .49$ ,  $p = .625$ , but by the last exam they tended to be slightly under-confident,  $t(219) = -2.797$ ,  $p < .01$ . A second question we investigated was whether students improved their metacognitive calibration (i.e. prediction accuracy) from the first to the last exam. A paired-samples t-test confirmed that students did become more accurate with their predictions from the first to the last exam,  $t(219) = 2.001$ ,  $p = .023$ . The main purpose of the study however was to test the effectiveness of our intervention in terms of 1) improving metacognition and 2) improving gains in foundational knowledge. We used a simple linear regression model to control for instructor effects. Results indicated that students in the Experimental Group showed greater improvement in metacognition calibration compared to the Control Group,  $Beta = .151$ ,  $p = .024$ ; however there was no significant difference between the groups in terms of the foundational knowledge assessment,  $Beta = -.109$ ,  $p = .110$ .

## PLANS FOR CONTINUATION AND EXPANSION

Our results lead us to recommend that instructors in our department address metacognition and study skills early in their courses. This suggestion has been circulated through formal departmental meetings and informal faculty teaching circles. This would be the real-world translation of the “motivational warning lecture” that does not impinge on instructors' academic freedom. Some of the participating faculty from our study have indicated an interest in continuing to use, and perhaps elaborate on, their exam wrappers in order to promote deeper reflection, and better follow through from students with regards to actually changing study habits.

## LESSONS LEARNED AND POTENTIAL IMPLICATIONS

The combination of an explicit warning lecture and exam wrappers shows promise as a way of improving students' ability to predict their grades. However, this does not automatically lead to improved learning, as we did not see any difference between the Experimental and Control group in terms of foundational knowledge gains. Students may need additional prompting/scaffolding to make the leap from understanding their level of competence, to actually improving their study habits. A second takeaway relates to the usefulness of standardized learning objectives and assessment tools. Although our metacognition intervention did not result in improvements in terms of foundational

knowledge, the assessment itself was a useful by-product of the study. When course learning objectives are standardized within a department, this presents an opportunity to develop assessments that are built from the ground up to align with those learning objectives. When all faculty teach to the same set of learning objectives, assessments can be shared by multiple faculty members, providing usefully generalizable data that can inform curriculum-related policies.

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# Introduction to Psychology (PSYC 1101) Course Redesign at eCore

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During the course of an online Psychology 1101 revision, Subject Matter Experts (SMEs) and designers created 10 multi-modal “Positive Thinking Corner” pages, each of which present a Positive Psychology topic relevant both to its lesson and to students’ lives. Videos, podcasts, and articles are linked, and students are offered their choice of two informal “reflections” to write, weaving their own experiences in with the material. The overwhelming positive student response has reinforced the notion that personalizing learning engages an emotional aspect that helps students bridge what is frequently a developmental growth spurt, particularly as it pertains to their self-concept and relationship to academia.

## STATEMENT OF THE PROBLEM

Goals for the formal revision of Introduction to Psychology, which began in earnest in February of 2018, included increasing student engagement, updating course content, and addressing equitable educational outcomes.

Our approach to the revision was both an acknowledgement that the course was not “broken,” as well as an invitation that anything was on the table. We considered this tone crucial to create a protected intellectual space in which the team itself could grow and take risks, both conceptually and practically, that would translate into the ability to accommodate and connect with students online in a meaningful way. In this way, the revision process would mirror the learning process we hoped to create in the online classroom — that students are not “broken” or empty vessels to be filled, but come with their own experiences and knowledge which need courage, imagination, and guidance to connect with the wider academic world.

The discussion on the use of the Reflection Exercises in particular centered around a way to infuse the course with personal applications that would help to scaffold the material, reflect the influence of the growing subfield of Positive Psychology (e.g., Seligman & Csikszentmihalyi, 2000 ) and also fulfill one of the course’s learning objectives: “Apply course content to everyday life - making better decisions; enhancing relationships; increasing self-understanding.” Metaphorically we envisioned these exercises, with both their supports and tasks, as the belay crew for the nascent, developing academic.

## METHODS

We added videos and podcasts to lend a human interest/storytelling element to the curriculum and break up the “wall of text” which can result from endless reading, and further scaffolded the lessons in the course, such as through the use of self-assessments, flash cards, and other supports. For instance, Subject Matter Experts (SMEs) wrote introductory video scripts for each OpenStax chapter, which our

Multimedia designer then paired with visuals from the text to produce what we called “Fireside Chats.” These videos acted as scaffolding measures, framing the work ahead and covering the highlights of the material in each Lesson.

One professor had requested that we include topics that had not previously been covered in the course, including Health/Positive Psychology. To this end, we incorporated a series of informal “Reflection Exercises” under the moniker of a “Positive Thinking Corner” page in each of the 10 Lessons. These pages presented Positive Psychology topics related to each Lesson at hand (i.e., Gratitude for the Memory Lesson, “Grit” for Research, Music and Meditation for the Therapy and Treatment Lesson, Forest Kindergarten for Development, and the concept of “Flow” for BioPsychology and Neuroscience). We included TED Talks, other short videos, and links to articles on the topic at hand, which might benefit the students, and then gave them a choice of two questions or activities on which to reflect in writing. These exercises gave the students the opportunity to scaffold the material on to their own experiences.

## OUTCOMES

Although the ABC rate for PSYC 1101 has gone down 2-3% percentage points since the revision (we attribute this to the increased rigor of the course overall), it remains generally high at around 75% or above, and the course completion rate has maintained at around 90-92% as enrollments have steadily increased. Students frequently comment on the Reflection Exercises as a positive part of their course experience in end-of-semester surveys, and instructors for the shorter, 8-week semesters have told us that they’ve offered students the option to drop the Reflection Exercises as a concession to the accelerated timeline, to which students have resisted. One instructor forwarded the following note from a student:

*“As a side note—and unrelated to this particular exercise, I wanted to take a moment to tell you how fascinating I have found these reflection exercises. Initially, I was a little close-minded or skeptical about them, but I have since come to really enjoy them. In fact, so much so, that they are now my favorite part of the weekly activities. They not only push me to explore myself and the world in new ways, but they have also given me unique tools and ideas to find peace. I truly commend you on the structure of your class.”*

When we read the Reflections submitted by students, we get a sense that we’ve created a bridge between academic content and personal/emotional involvement. When students think of schoolwork in colorful, personal terms, rather than standard right or wrong academic answers, what emerges are developmentally healthy and socially conscious opportunities to contextualize and expand the meaning of learning. The reflections help us and them reach heights of personal, social, and intellectual achievement. In their essays, we often feel a quintessential humanness. It is a beautiful thing. It may have a lot to do with it being Psychology that they are studying, but why not try and get them to think of Math, Geography, or other subjects in terms of emotions, and how that might affect Mother Earth or humanity as a whole.

## PLANS FOR CONTINUATION AND EXPANSION

In light of this response, eCore has gone on to include informal journal entries in the first Lesson of ENGL 1101, where students are prompted to take an online Critical Thinking quiz and reflect on the results, describe a memory in sensory writing along the lines of Eudora Welty, or are introduced to Inquiry in Research through one of Ballenger’s Brainstorming activities. Informal, reflective writing can also serve

as a metacognitive checkpoint, one we've leveraged in "Post-Assignment Feedback and Reflection Plans," where students plan out and explain how they can use instructor feedback and change their study strategies to improve their own performance. We've also included four Reflection Exercises in the development of HIST 2112, again offering students the option to tell how and where their families might show up in historical census data and other immigration documents, or discuss their surprise over the initial support for abortion among evangelicals, and what political forces worked to strategically change that. We've also, just this spring, increased the grade percentage of the PSYC 1101 Reflection Exercises from 5 to 10%.

## LESSONS LEARNED AND POTENTIAL IMPLICATIONS

The reflection exercises perform at both the personal and course content learning levels. Reflection material was designed to be approachable — that is, non-directed for gender or SES — and to have broad appeal. Because students are prompted to reflect personally on their own experiences (on which they are experts), the reflections promote feelings of success and contribution to the course, and generally build academic confidence, as well as trust with the instructor (the only person with whom the reflections were shared) and a personal connection with the material. The reflection exercises also promote an equitable tone in the online environment — implying that everyone's points are valued (though they might have more or less quiz points, or academic experience than others), and that their various and diverse life events "count" and not only add to the course but connect the students deeply to the curriculum. This result is in stark contrast to the idea that students' experiences need to be "corrected," or the idea that they take up too much valuable real estate in most face-to-face classes. Additionally, by becoming more familiar with personal aspects of their students' lives, professors are more prone to empathize with them, to reach out and respond to students, which not only supports students, but aids in their own development, both pedagogically and humanistically. We are enthusiastic about our future use of reflection exercises as a pedagogical tool — this may be something of a panacea for the online learning environment.

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<sup>6</sup> Seligman, M. E. P., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychologist*, 55(1),5-14.



## Introduction to Sociology (SOCI 1101) Course Redesign at Georgia Southwestern State University

Jamie MacLennan

The following is a case study on a Gateways to Completion (G2C) course redesign in two sections of Introduction to Sociology (SOCI 1101) at Georgia Southwestern State University (GSW). The course redesign is currently in year two of the process and, so far, consists of: 1. bolstering supplemental instruction (SI) and 2. the administration of pre- and post-exam wrappers. Results indicate that SI is beneficial for the small number of students who utilize it and that exam wrappers increase metacognitive skills and slightly improve subsequent exam performance.

### STATEMENT OF THE PROBLEM

For at least the last 20 years, there have been three faculty members teaching Introduction to Sociology (SOCI 1101) each semester at Georgia Southwestern State University (GSW). All have been strongly committed to student success. Unfortunately, the percentage of students who have been successful in the class has never been as high as we would like. For instance, over the 10-year period from 2001 to 2010, the DFWI rate was approximately 35%. With some faculty turnover since that time and through the concerted efforts of those who have taught the course more recently, the DFWI rate went down to just under 20% over the three-year period from the spring semester of 2016 to the fall of 2018. Members of the SOCI 1101 course-specific committee believe that this is still too high.

When we looked into the numbers more deeply (data are from the 2014-15 to 2017-18 academic years), it became evident that student success rates varied substantially based on student characteristics. Most remarkably, students who came to GSW with a high school grade point average of less than 2.5 had a DFWI rate near 60%, compared to a DFWI rate of 12.3% for those students with a high school GPA above 3.5. Furthermore, the committee discovered other, smaller, discrepancies. Specifically, men had a DFWI rate almost 10 percentage points higher than women. In addition, Blacks had a DFWI rate 5 percentage points higher than Whites. Finally, we found that first-year students had a DFWI rate over 10 percentage points higher than non-first-year students. When considering the nature of our course redesign, these were some of the inequities that we had in mind to rectify, particularly the sex and race gaps. Beyond DFWI rates, we also found it problematic that students have not been taking advantage of the various support services that are available to them at GSW. Many students also lack metacognitive and study skills.

### METHODS

During the self-study phase of the G2C process (year 1), the SOCI 1101 course-specific committee spent a great deal of time trying to understand the reasons for the low student success rate and brainstorming what to do about it. While we came up with many potentially fruitful redesign strategies, we decided to implement one substantial redesign element per semester (beginning with what we thought would be most impactful) in order to isolate their effectiveness. First, since we concluded that most students who struggle in SOCI 1101 do not take advantage of the support services that are available at GSW, we decided that redoubling our efforts at increasing participation in supplemental instruction (SI) sessions had great

potential for increasing the performance of those students who are most at risk (i.e., those with low high school GPAs, men, Blacks, and first-year students). We introduced this redesign element in the fall of 2019. Specifically, we encouraged students in the first week of the semester to attend weekly SI sessions, reminded them each week during the semester, and gave them extra credit for attending. The instructor implementing the redesign also worked closely with the student supplemental instructor to ensure that the content of the SI sessions was accurate and thorough. Second, we have observed among many students a lack of effective study strategies combined with a lack of awareness of the inadequacy of their study strategies. As such, we implemented pre- and post-exam wrappers in Spring 2020 to facilitate greater metacognition and as an opportunity to discuss useful study strategies.

## OUTCOMES

The first significant element of the course redesign involved bolstering participation in Supplemental Instruction (SI). This began in the fall of 2019, when there were 38 students combined in the two sections of Introduction to Sociology (SOCI 1101) in which the redesign was implemented. We hoped to achieve as much SI attendance as possible by offering sessions twice a week at times when most students were available as well as by offering extra credit points for attendance. Unfortunately, despite these efforts, attendance at the SI sessions was low. Only 9 students ever attended. Of those, five students attended only once, while two attended twice. Two students (one White male and one Black female) participated frequently, attending 8 sessions each. Interestingly, both of the high attending students got As in the class. While it is impossible to know whether or not they would have achieved As had they not attended the SI sessions, it obviously did not hurt. In informal conversations, these two students said that, “the [SI] sessions are really very helpful” and “I’m so glad that they are available for me to help with things I don’t understand.”

The second major element of the course redesign consisted of the administration of pre- and post-exam wrappers. This began in the spring of 2020, with 38 students combined in the two sections of SOCI 1101 in which exam wrappers were administered. The pre-exam wrapper included questions aimed at uncovering how much time each student spent studying, how they studied, and how they thought they would perform on the exam. The post-exam wrapper included questions designed to help students assess what types of questions they had the most difficulty with, how they thought they might prepare differently for the next exam, and provided them an opportunity to suggest ways that the instructor could help them better prepare for future exams. The goals of exam wrappers are for students to gain a clearer sense of the connection between their efforts and the results they achieve as well as providing a starting point for class discussions about effective studying techniques (after handing them back with the exam). The results were modestly encouraging. Specifically, the average exam score increased by one point out of 100 from the first exam to the second (n=38). That might not sound like much, but some previous semesters actually showed a decrease of up to 1.3 points from the first to the second exam. Remarkably, the average score for men increased by 8.5 points (n=8). Unfortunately, the average score for Black students declined by 3.3 points (n=12). This may, in part, be due to the fact that the average score for Black students on the first exam was above average to begin with. In addition to these quantitative results, student responses on the exam wrappers indicated an improved awareness of the connection between the efforts they made studying and their performance on the exam. Interestingly, in their post-exam wrapper responses, several students mentioned that they should attend the SI sessions in order to do better on the next exam. I did not analyze the impact of exam wrappers on the third and fourth exams because of the incomparability of scores since they were administered online in the wake of COVID-19.

## PLANS FOR CONTINUATION AND EXPANSION

The effectiveness of SI sessions has been encouraging, albeit limited to very few students. As such, their use will be continued in future sections of SOCI 1101 while making a greater effort to encourage students to utilize these services. This may be accomplished in one of two ways: either increasing the amount of extra credit offered or requiring students who score below a certain amount on the first exam to attend SI sessions until they score higher than the threshold amount on a subsequent exam. Due to a lack of resources at GSW, we do not currently have plans to expand the use of SI sessions to more courses. That said, all courses in the general core are supported by SI and/or individual tutoring. We are enthusiastic about the prospects for improvement from the use of exam wrappers; not simply in terms of student exam scores, but as indicated by the increase in self-regulated learning. In light of this, the use of exam wrappers will be continued. Furthermore, existing research indicates that exam wrappers are more effective when a student completes them in multiple classes (Lovett, 2013). All three of the sociology faculty have agreed to implement them in their classes. In addition, we conducted a training workshop in August 2020 for faculty across GSW to encourage even wider participation.

## LESSONS LEARNED AND POTENTIAL IMPLICATIONS

Due to low utilization, the use of SI sessions did not make a significant impact on the DFWI rate. That said, however, even a small number of students noticeably impacts success rates in small-sized classes. In this particular case, for example, eight out of 38 students (21%) got a DFWI in fall 2019. This was right at the average for the previous 4 years. If just 2 more students succeeded (which is how many students frequently participated in SI sessions), the rate would have decreased to under 16%. Assuming that SI sessions actually help (which we believe), it is likely that taking the time to identify, encourage, and possibly incentivize those students who are struggling in the course to attend the SI sessions could further decrease the DFWI rate. With respect to the administration of exam wrappers, it is early to tell what impact they are making. The literature suggests that the cultivation of metacognitive skills through the use of exam wrappers does not happen all at once nor does it immediately translate into improved performance. The major challenge with exam wrappers is that even when students can see that their lack of effort results in poor performance, it does not mean that they will increase their effort. The same is true for SI sessions. Having them available does not mean that students will attend, even if they are struggling. Given this reality, consideration will be given to a future redesign element focused on increasing the perceived value of academic success in order to increase student motivation.

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## Investing in the Core: Enhancing G2C Communication and Visibility at Georgia Gwinnett College

Catherine Thomas

Rachel Bowser

During the initial G2C rollout at Georgia Gwinnett College (GGC), key partners for enacting pedagogical interventions were easily identifiable and on-boarded, but cross-functional area involvement and literacy were harder to achieve because of inconsistent messaging. We established two goals for improving and sustaining project productivity: 1. Renew buy-in from key campus partners and 2. Increase institutional literacy about the initiative. Through a combination of promotional presentations, regularized communication pathways, and identification of synergies between G2C and ongoing initiatives among stakeholders, a new cultural framework around G2C was created, prioritizing transparency and broad access to data and existing resources.

### STATEMENT OF THE PROBLEM

As a (relatively) new and rapidly growing institution, Georgia Gwinnett College (GGC) has had to manage a range of communication issues resulting from a still-developing infrastructure and an often-compressed timeline between the recognition of a need and the implementation of a solution. In the case of the initial Gateways to Completion (G2C) rollout in 2017, messaging and organizational issues led to less focus about the direction of the initiative and the contributions of individuals optimally positioned to engage the effort. Campus partners had varying degrees of knowledge about the work and were unevenly invested in the stakes of it. Coming to the project as liaisons midstream, and both having faculty appointments and strong ties to the faculty community, we identified two key goals for moving the project into its next, most productive and sustainable phase: 1. Renew buy-in from key campus partners; and 2. Increase institutional literacy about the initiative. We approached both of these goals as opportunities for infrastructure building at GGC. We knew that infrastructure would require clearly defined, regularized communication and reporting within our core team, as well as systematic communication and reporting out to the broader campus community. Standardizing our communication culture was a first step toward addressing another challenge for fast-growing institutions like ours – a proliferation of often overlapping initiatives. The more we reported (in and out), the more we would find existing resources to leverage, we hypothesized. Finally, we hoped the increased visibility that comes from a solid communication infrastructure, as well as the increased efficiencies from finding synergies, would afford us opportunities to advocate for more resources in recognition of our key partners' hard work in the service of our students' success in gateway courses. These communication and literacy goals were intended to increase enfranchisement and investment in the initiative throughout the college. In so doing, they would improve data literacy about the equity gaps in our target courses, while more widely promoting and disseminating existing High-Impact Practices (HIPs) and interventions.

## METHODS

Our approach to ensuring buy-in engaged different levels of the organization and stakeholders with diverse perspectives. Firstly, we wanted to elevate G2C work in visibility and significance with campus leadership. Secondly, we wanted course coordinators to have full backing of disciplinary colleagues, which required greater transparency about the nature and goals of G2C. To the first end, we secured small stipends for coordinators, along with a Provost memo indicating that the leadership work for G2C should earn the principals full credit for service as a component of annual reviews. We reinforced coordinators' leadership expectations with monthly meetings and a clear reporting structure. To the second end, we undertook a "G2C roadshow," visiting faculty and leadership meetings. We kept our presentations brief, providing an overview of the Gardner Institute, the goals of G2C, and the efforts underway in our intervention classes. Our walk-through of the institutional inventory data invariably was the most productive part of our visits, resulting in many attendees asking for their own access. In effect, we were able to demonstrate the data-based ethos of the project, spark constituents' curiosity, promote involvement, and alleviate some initiative fatigue via clear demonstration of utility and grounding principles. To both of these ends, we worked with our course coordinators to thoroughly workshop the JNGI Key Performance Indicators (KPIs) for each course, at the same time that we created an exhaustive inventory of student success initiatives across the college. This thorough effort in both areas allowed us to leverage already-existing initiatives as shared areas for improvement.

## OUTCOMES

We are, all of us, thinking differently about outcomes than we were prior to the COVID-19 pivot, and we cannot think about our progress on this initiative apart from that reality. Fortunately, because so many of our efforts in Academic Year '19-'20 were aimed at building robust communication infrastructure, reporting habits, and cultural literacy about G2C efforts, we are well-positioned to move forward in an uncertain environment. The success of this year's work has landed us in a place where the initiative is regularized and routinized enough to weather a change in modalities and to find its most adaptable parts. The second part – adaptation – has led us to realizations we hadn't been pursuing. Some of the interventions our team operationalized – Transparency in Learning and Teaching (TILTed) assignments, for example – are much more readily adaptable to an online environment than others, presenting opportunities for even further expansion across campus. Our most valuable outcome, then, and the one that ensures that this work seeds a sustainable change, is the creation of a new cultural framework around G2C, one that prioritizes transparent and regular communication and broad access to data and existing resources. That new framework, combined with the needs that the COVID-19 pandemic has made urgent, allow us and our team to think more carefully about the interventions we plan to scale for Fall 2020, and to think about the range of contingency plans we should work through. One of the most keen opportunities is the imperative to evaluate the stakes of equity matters as we imagine a range of modalities for instructional and intervention delivery.

## PLANS FOR CONTINUATION AND EXPANSION

The COVID-19 online pivot has illuminated which G2C and G2C-adjacent interventions are sustainable and scalable across platforms and time. Among these are efforts to promote students' self-efficacy and growth mindset. This year, GGC invested heavily in messaging, supporting, and integrating academic growth mindset interventions across campus. These efforts synchronized work for G2C, USG's Momentum Approach, and GGC's ongoing student success programming. ENGL 1101 Composition I (one

of our G2C courses) and GGC 1000 First-Year seminar sections participated in the pre-/post- USG mindset surveys. GGC 1000 and learning support Math and English instructors accessed materials on academic growth mindset through the USG's partnership with Motivate Labs. Many GGC 1000 instructors included activities on cultivating growth mindset; many learning support (Access) Math instructors assigned students MyMathLab videos to learn about applying mindset concepts; GGC's STEM IV grant team incorporated growth mindset training for its PSI (Peer Supplemental Instruction) leaders. The G2C team intends to promote and expand these efforts to stimulate students' engagement with mindset-oriented activities. Similarly expanding is our faculty's exploration and integration of informed pedagogy, a goal that G2C shares. Our G2C ENGL 1101 course team featured TILT as its primary intervention. As we shifted to online learning in March, the TILT design method increased the likelihood that students could fully engage material—whether learning synchronously or asynchronously. The G2C leadership team continues to advocate for TILT as a universal pedagogical intervention that that increases equity potential and reduces achievement gaps.

## LESSONS LEARNED AND POTENTIAL IMPLICATIONS

Through a careful assessment of GGC's G2C organizational structure and accomplishments to date, we were able to identify and tackle several obstacles to programmatic success. These obstacles included: 1) A proliferation of USG-led and strategic campus initiatives that were similar in broad strokes to G2C. There was identifiable confusion among stakeholders about what work was connected to which thing and what was at stake in them; 2) In turn, this lack of clarity about initiatives and interrelatedness presented an obstacle to buy-in; 3) With less central coordination and communication that clearly illustrated synergies and opportunities for collaboration, project management approaches were siloed and differentiated vs. unified and systematized. One universally recognized detriment of that initial model was lack of data sharing and data consistency both vertically and horizontally across campus. Our efforts as liaisons have focused on building infrastructure and consistent communication pathways for G2C. This work will continue, as we seek to share with our colleagues the ways in which G2C course redesign efforts may dovetail with projects they're already doing (TILT, SEED grant-funded pedagogical interventions), other primary initiatives (such as Momentum Approach and learning communities) and ongoing student success programs (tutoring, PSI, learning support, etc.). Further, with the recent onboarding of a Vice President for Student Engagement and Success, more concentrated efforts are underway to identify, gather, and share out key metrics across campus. This increase in data analysis and literacy, supported by the full leadership team, can be understood as building on the groundwork G2C has laid.

## G2C Case Study: VSU (Valdosta State University) Cultural Transformation: The Unforeseen Journey from Then to Now

Shani P. Wilfred

Theresa J. Grove

When facing adversity at the institutional level, many faculty find it hard to be innovative and optimistic, which can hinder the institutional transformation that is needed to adapt to changes in the higher education landscape. The challenges facing Valdosta State University (VSU) are not unique to comprehensive universities; through our self-reflections our goal is to become more responsive and adaptive to future challenges, and by sharing our experiences we hope that other institutions can learn from our past. This case study provides an overview of the cultural transformation that is taking place at an institution to build momentum toward student success, stakeholder buy-in, identity development, and a plan for continued growth.

### STATEMENT OF THE PROBLEM AND OPPORTUNITIES

Periods of upheaval can lead to low morale and reduced buy-in from stakeholders, which can adversely affect a university's ability to move forward. In the fall of 2015, VSU experienced administrative turnover, budget reductions, reduction in force, and low retention rates. As a result, a task force composed of faculty, staff, and administrators from units across the institution was commissioned by the interim president to develop ideas that would increase student success as measured by retention and graduation rates. While this task force pursued change in a variety of areas including advising, pedagogy and curriculum, and student support services, which had the potential to transform institutional culture, under the leadership of a second interim president only the top three options were pursued: enhance the existing student support portal, transition to a professional advisor model, and participate in the Gateways to Completion (G2C) initiative, which is the focus of this case study.

The task force, with some input from departments, identified large enrollment courses with relatively high DFWI rates to participate in G2C because of the potential to positively impact a large number of students. Several courses with the highest DFWI rates were excluded because the large enrollment criterion was not met; all the selected courses were part of the required Core Curriculum and taught by disciplines in the College of Arts and Sciences. Unfortunately, a rumor spread that this college was being targeted because it was primarily responsible for VSU's low retention rate, which then created the challenge of obtaining and/or sustaining buy-in of the stakeholders who were being asked to participate in G2C.

This problem created the incentive that led to numerous opportunities for the G2C liaisons to interact directly with stakeholders to clarify the focus of the G2C initiative, which facilitated the growth of a culture of collaboration between faculty, administrators, and the G2C liaisons. It also presented opportunities for the G2C liaisons to interact with other local and national G2C liaisons (both faculty and administrators), members of the University System of Georgia leadership team, and the founder and staff of the Gardner Institute. These interactions were invaluable in helping the VSU G2C liaisons identify problems and then develop and implement plausible solutions. As a result, five courses from five separate disciplines were redesigned by nine faculty. These faculty worked with the G2C liaisons to

assess trends related to student success in their courses and to develop course redesign strategies that would target areas in which students historically had not been as successful.

## APPROACH

A multi-faceted approach has been used throughout VSU's participation with G2C, following the central tenet that organizational transformation is ongoing. We continue to modify our processes to affect institutional transformation by linking our actions to the strategic plan, incorporating self-reflection, and being adaptable. When VSU first began the G2C initiative, it was a university-wide task force that chose courses in History, English, Biology, Math, and Chemistry because they were large enrollment core and introductory classes with significant DFWI rates, and as such, they had the potential to positively impact the greatest number of students. At that point, the G2C liaisons who were members of the university task force reached out to the dean, department heads, and faculty who taught these courses and requested participation. While the faculty were student-centered, we faced limited expansion of these efforts in the departments. To make greater inroads into changing faculty culture and strengthening institutional transformation, in summer 2019 a retreat was held to support and reinvigorate the faculty who were leading course redesign. During this process a common course redesign and assessment plan that could be used for general education as well as major specific courses was developed. Also, at this time, the role of G2C liaison became the responsibility of the General Education Coordinator, and since the development of the Center for Excellence in Learning and Teaching (CELT) was established, G2C liaisons have relied on our strong collaborative ties with the CELT director to strengthen communication and support for faculty across campus. Currently, we are in the process of connecting course innovation, redesign, and assessment to general education assessment in order to institutionalize this process.

## OUTCOMES

VSU has participated in G2C for five years, and throughout this time there have been significant changes to how VSU has approached student retention and success. It was through actions of the task force that led to important redesign and reorganization within the university, some of which stemmed directly from the G2C initiative, and others that grew out of related conversations and actions of stakeholders across campus. Prior to the G2C initiative there was not a centralized movement that focused on student success. However, from groundwork was formed by the task force, VSU created the Division of Student Success that helps to connect the strengths of Academic Affairs and Student Affairs to form new collaborations across campus. Until this point the focus of the G2C initiative had been intertwined with institutional cultural transformation, and while the indirect connection to what was happening at VSU could be identified, the question of what was the direct impact of the G2C initiative on VSU has to be addressed. The answer to this question can be summarized into four categories: course innovation, campus engagement, assessment, and faculty development.

### **Course Innovation**

As a result of the efforts of the G2C course committee chairs, several course innovations were developed. These course innovations were implemented, periodically, in G2C courses over the past five years. With limited data, there have been several positive results identified anecdotally regarding these course innovations that include reduced DFWI rates, which have been shared with the G2C faculty members' departments. There are also plans to develop opportunities for the sharing of these course innovations more broadly within the VSU community and beyond.



### **Campus Engagement**

G2C has expanded its campus engagement through the participation of one of the G2C liaisons on the Student Success Council and the Faculty Success Council. These councils, which are designed to address issues related to the success of students and faculty, respectively, are composed of leadership and stakeholders from units across the institution and are able to address issues and opportunities at VSU. Serving on these councils ensures that innovations, comments, and concerns generated by the G2C course committee chairs or the steering committee are brought to the attention of the councils and are also taken into account by the councils as they develop and implement solutions.

### **Assessment**

In the fall of 2018, the membership of the G2C steering committee was expanded to include members outside of Academic Affairs and was given the charge to identify the G2C course strategies and innovations that were working and that could be applied to all courses at VSU. This resulted in a renewed focus on how curriculum and pedagogy were assessed at VSU. In collaboration with the Director of Institutional Effectiveness and the Associate Provost for Academic Programs and Services, the G2C liaisons revised the existing Core Curriculum assessment plan and report templates so that they can be used to assess pedagogical and curriculum innovation in any course at VSU, and as such they are a potential springboard for the development of a multi-purpose data and assessment repository for institutional-related reporting. These revised forms will be piloted, revised, and fully implemented as a part of related general education revisions at VSU.

### **Faculty development**

During the summer of 2019, G2C faculty were able to participate in a retreat that was developed by the VSU G2C liaisons and the Director of the CELT. The retreat was designed to encourage G2C faculty to continue their efforts in addressing student success and retention at VSU through the evaluation of what they had already accomplished, planning for what they would like to accomplish in the future, and the identification of strategies that would facilitate the implementation and sharing of their plan with faculty in their department. Faculty who participated in the retreat found that the retreat reinvigorated their commitment to address barriers to student success and identify ways to increase buy-in from their departmental colleagues. Finding ways to continue to offer this retreat, and other retreats that are designed to engage faculty and support their development in collaboration with CELT are being explored.

## **PLANS FOR CONTINUATION AND EXPANSION**

We believe that the actions over the past five years have enabled VSU to set a course that will lead to increased student success at VSU. While we started a collaborative process, there are still areas that need to be addressed and hurdles to overcome. There is still some hesitancy amongst stakeholders to fully engage because of questions and concerns related to ownership and uncertainty about intentions or effectiveness of these initiatives. Over the last two years we began to expand the course redesign and assessments into other courses within the general education curriculum at VSU, which led to the participation of the stakeholders in the Institute on General Education and Assessment (IGEA). At this institute a plan was developed that focused on collaboratively re-defining what general education is at VSU and that will be shared with the university at large this upcoming year. CELT will continue to develop opportunities for the continued learning of faculty across campus who seek to better understand curriculum and pedagogical issues related to student retention and success. CELT is also creating opportunities for faculty and staff collaborations through the identification of faculty fellows who will help train interested faculty and staff and who will develop templates of strategies that can be utilized at the institutional level to continue to address student retention and success.

## LESSONS LEARNED AND POTENTIAL IMPLICATIONS

The lessons learned throughout our participation with G2C re-enforce the idea that there are cornerstone practices that when followed are more likely to lead to innovation within and transformation of the institution, thus leading to the success of its stakeholders. First, clear communication of the values and goals of the institution is required for institutional transformation. When communication is weak or mistrust is present, processes of change are sluggish, and stakeholders can become frustrated and disengaged, which can lead to stagnation or to the duplication of efforts and wasted resources. Second, trust and respect between and among stakeholders at all levels are needed to increase engagement and reduce fragmentation. VSU's initial participation with G2C was during a challenging period in VSU's history when administrative turnover was high and there was faculty angst due to reductions in force, which led to mistrust of administration and the misperception that required participation was punitive. In addition, the reduction in force directly impacted innovative and productive faculty, which led to low morale and decreased faculty engagement within departments. All of these conditions resulted in reduced engagement of core faculty and slow expansion of participation and engagement within departments. Institutional transformation is a slow process. The greatest value of some initiatives is that they lay the foundation upon which the university can build; while the exact name of an initiative may not be remembered in the future, the impact is far reaching. VSU's G2C is this type of initiative, because while it grew out of a time characterized by disorganization, frustration, and disenchantment, it was an integral part of the institution's transition to the current environment that includes a supportive administration, increased engagement at all levels, renewed hope, and the presence of new opportunities.

## CONCLUSION

Cultural transformation is not an easy task nor is it a quick fix. Coming through a darker period in VSU's history to the present, with a student-centered administration that values faculty and staff, in which silos are being removed, participation and engagement is increasing across campus, communication is strong, and trust is being restored; it has been a difficult but necessary journey. The institutional culture within VSU is changing to a collective focus on the success of our students. Because we, as an institution, have a clearer understanding of our purpose and a clearer idea of where we want to go, we will continue our journey of transformation that started five years ago with G2C.





Gardner Institute

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