The midterm wrapper: quasi-experimental evidence of an effective performance intervention

Christie Cathey

Missouri State University

Lydia Needy

Texas A&M University

Charles Hoogland

Moffitt Cancer Center in Tampa, FL

Abstract

The current study examined the effectiveness of a midterm performance intervention designed to help Introductory Psychology students improve their study skills and course performance over the second half of the semester. The 'midterm wrapper', a self-reflective online performance intervention, asks students to engage actively with their midterm grade feedback by listing all scores that made up this grade, comparing their own past study strategies and academic habits to a list of effective strategies and habits and listing the study-related adjustments they plan to make for the second half of the semester. In a quasi-experiment, we compared 402 students who completed the midterm wrapper to 376 students who did not complete it on their post-midterm course performance. As hypothesized, controlling for pre-midterm performance, students who completed the midterm wrapper assignment scored higher on all post-midterm exams, completed more post-midterm homework assignments and ended the course with higher final grades than those who did not complete the assignment. The midterm wrapper takes little time on the part of instructors or students, but it is an effective means of encouraging students to reflect on their past performance and make necessary adjustments in time to improve their overall course performance.

Keywords: performance intervention, midterm grades, study skills

Introduction

Early alert programs are initiatives designed to identify and reach out to students deemed to be at risk of academic failure, with the goal of improving student success and retention rates (Villano *et al*., 2018). Most American colleges and universities use some type of early alert program, and the majority of those use midterm grade feedback as a key component of their early alerts (Hanover Research, 2014). Despite the large number of institutions requiring instructors to submit midterm grades, surprisingly little empirical research has been conducted on the effectiveness of receiving midterm grade feedback on students' subsequent course performance. Results of the few early studies on this topic were mixed, with some pointing to the limited utility of midterm grade feedback (for a review: Alley, 2002).

The assumption behind giving midterm grade feedback is that midterm grades will serve to let students know where they stand in a particular course and will thereby motivate those with low midterm grades to make necessary adjustments to their academic behaviors. Midterm grades ideally serve as one piece of a course's formative assessment, helping students diagnose their own struggles and gaps in learning, identify specific ways of improving their learning and understand that the ultimate goal is to improve learning, not just to earn a particular grade (Trumbull and Lash, 2013). Such formative feedback is important, as students tend to be inaccurate (typically overconfident) about their own learning and thus underprepare for summative assessments like final exams (for a review: Miller and Geraci, 2011). Midterm grades thus provide students with accurate feedback on their performance while there is still time to adjust their study habits and, if used properly, this feedback can serve as an important tool for learning.

Unfortunately, when students receive midterm grades with no special guidance, they often do not know how to respond to the feedback (Donnelly, 2010); one likely cause is that many – especially first-year – students have not yet learned to approach their academic work in a self-regulated way. Self-regulated learning (SRL) is a process by which students take an active role in managing their own learning and academic engagement (Panadero, 2017) and involves a cycle of: 1) forethought (i.e., planning, setting goals, deciding on learning strategies); 2) performance (i.e., employing learning strategies and monitoring one's performance); 3) self-reflection (i.e., reflecting on past performance, making causal attributions for performance) (Zimmerman, 2000). Much research has shown the key role SRL plays in academic success (Dent and Koenka, 2016; Ho, 2004; Mega *et al*., 2014; Zimmerman, 2011) and, fortunately, there are numerous ways by which instructors can help students develop an SRL approach to their academic pursuits (Dignath *et al*., 2008; Dignath and Büttner, 2018; Guven and Babayigit, 2020; Russell *et al*., 2022).

Midterm grades provide potentially valuable data for the self-reflection phase of SRL, in that students can use those grades to consider their past performance and the specific academic behaviors that led to it; however, for students to take advantage of this feedback, it may not be enough for instructors simply to submit midterm grades. One problem is that, without explicit instructions, many students might not even take the time to look at their midterm grades. Our institution, a mid-sized state university in the Midwestern section of the United States, requires faculty to submit midterm grades for all students in all 100- and 200-level courses and students can access their midterm grades through the University's online grade portal. Though certain

organizations on campus (*e.g*., fraternities and sororities, athletic teams) require their student members to submit their midterm grades to the organization, there are often no other incentives for students to access those grades.

Another problem is that students do not necessarily see their midterm grade feedback, or any assessment feedback, as useful data for academic improvement. Students vary in their conceptions of the purpose of assessment and these perceptions are an important predictor of students' likelihood of using performance feedback in ways that are consistent with SRL. For example, holding the belief that assessment provides a means for academic improvement is predictive of academic gains and behaviors consistent with SRL (Brown and Hirschfeld, 2008). Thus, it is important not only to give incentives for students to examine their midterm grades but also to help them see this feedback as being a valuable piece of information for their future success by showing them how it can be used as part of the SRL process.

Recognizing that merely submitting midterm grades was likely not as helpful to students as we might wish and hoping to help our struggling students learn to see midterm feedback as valuable for their own learning and improvement, instructors of our Introductory Psychology course offered, for many semesters, one-on-one, face-to-face midterm meetings for students with midterm grades of D or F. In those meetings, the instructor and student looked together at the student's grades from the first half of the semester, discussed the student's typical study habits and strategies, talked about effective study strategies and devised a plan for the second half of the semester. Each student worked with the instructor to write a 'prescription' listing all the course-specific academic behaviors the student planned to engage in through the end of the semester and the student left the meeting with a copy of that prescription.

Informal feedback from students who attended a midterm meeting suggested that they found their meeting helpful, providing them with a better sense of the changes they needed to make to improve their course grade by the end of the semester. Unfortunately, given our high enrollment, midterm meetings were quite time-consuming for instructors and fewer than half of the invited students ever took advantage and attended a meeting. Moreover, we wanted to offer an opportunity for *all* students, not just those with low midterm grades, to take advantage of the benefits of self-reflection and study planning afforded by these midterm meetings.

We therefore created a new intervention called 'the midterm wrapper'. This online assignment takes very little time on the part of students or the instructor and can easily be offered to all students, even in high enrollment classes. We modeled the midterm wrapper after the 'exam wrapper' (Lovett, 2013), which is an assignment that asks students to reflect on their preparation and performance on a recent exam and to then come up with a concrete plan to prepare for the next exam. Results of numerous studies have pointed to the effectiveness of exam wrappers at improving student performance on subsequent exams in a variety of academic disciplines (Craig *et al*., 2016; Chew *et al*., 2016; Lovett, 2013; Gezer-Templeton *et al*., 2017; Edlund, 2020).

For the midterm wrapper, the scope of the assignment is expanded. That is, rather than focusing on a single exam, students reflect on their performance on *all* components of the course over the entire first half of the semester. Specifically, the midterm wrapper first asks students to consider

the distribution of points that determined their midterm grade by having them list the points they have earned thus far on all assignments and exams. It then asks students questions about their performance and the amount of time they spent preparing for each of the first two exams and presents them with a checklist of effective study strategies, asking them to mark the ones they have used. Finally, it asks students to write down a plan for the second half of the semester in the form of a list of three specific actions they will take to improve or maintain their course grade. In this quasi-experiment, we examined the effect of completing the midterm wrapper on students' subsequent course performance; we compared students who completed the assignment to those who did not in relation to their weekly homework scores, exam performance and final semester grade, controlling for previous course performance. We made the following hypotheses:

1. Students who completed the midterm wrapper assignment would earn higher scores on exams that took place during the second half of the semester compared to those who did not complete the assignment.
2. Students who completed the midterm wrapper assignment would complete more homework assignments during the second half of the semester compared to those who did not complete the assignment.
3. Students who completed the midterm wrapper assignment would end the course with higher final grades than would those who did not complete the assignment.

Method

Participants

Participants in this study came from three sections of Introductory Psychology at a mid-sized public university in the Midwestern section of the United States. There were 843 students originally enrolled in the three sections of the course at census. We excluded from analyses 34 students who dropped the course and 31 students with at least one missing exam score. Of the remaining 778 students, we compared the 402 students who completed the midterm wrapper assignment to the 376 students who did not.

Prior to collecting data from the midterm wrapper, we obtained approval from the University's Internal Review Board. As our research protocol involved typical educational practices, we were not required to obtain students' informed consent. Rather, we included a statement on our syllabus, in informative emails to students and in the 'Midterm Wrapper' tab in our learning management system, Blackboard. This statement let students know how we use student data in research and gave them the option to request that we exclude their data. No students made this request.

Materials

Performance Worksheet

The top of this worksheet instructed students first to look up their grades in the course's Blackboard gradebook and then to write each of their scores in the spaces provided. The worksheet listed all assignments and exams, with the points possible for each, and provided blanks for students to record all points they had earned during the first half of the semester. Finally, the worksheet instructed students to add their points, write down their total points at midterm and calculate their midterm percentage score by dividing their total points by the points possible at midterm. The worksheet also included a list of all remaining assignments and exams for the remainder of the semester and their corresponding possible points.

Midterm Wrapper Assignment

Students completed the midterm wrapper assignment online through Qualtrics. The assignment required students first to refer back to their completed performance worksheet in order to answer fifteen items about their performance and study habits over the first half of the semester. The first four items asked students how many points they had earned at midterm, what their midterm percentage was, how many points were left to earn by the end of the semester, and the extent to which they were happy with their midterm grade on a scale from 1 (*extremely unhappy*) to 7 (*extremely happy*). The next two items asked students what letter grade they hoped to earn by the end of the semester and how likely they thought they were to earn that grade on a scale from 1 (*extremely unlikely*) to 5 (*extremely likely*). The next eight items asked about performance on and preparation for the first two exams. For each exam, students indicated their score, whether or not they had attended a required study session, how many days they spent studying, and how much total time they spent studying, using a checklist with seven options ranging from 'less than fifteen minutes' to 'more than five hours'.

The next item presented students with a checklist of twelve successful study strategies. To ensure that our checklist was tailored to the specific components of our course, we created it using feedback solicited from former students who had ended the semester with a grade A. We did this by first sending emails at the end of two previous semesters to all students who earned an A, asking them what advice they would give to future students. We then curated responses related to exam preparation and created a checklist of study strategies. We made sure to exclude study strategies that were not empirically supported (*e.g*., re-reading assigned chapters). Example strategies include: "I thoroughly read each assigned chapter" and "I take good notes in class and review those before the exam". Instructions for this item asked students to think about how they typically prepare for exams for this class, to examine the list of study strategies and to mark all the strategies they used during the first half of the semester.

The next item asked students to list at least three things they planned to do to improve their grade (or maintain it, if they were happy with it) during the second half of the semester. Following that

was an open-ended question that asked students what we, the course staff, could do to help support their learning and preparation over the second half of the semester.

The final five items asked students about their perceptions of the midterm wrapper assignment. For these items, students indicated their level of agreement from 1 (*strongly disagree*) to 7 (*strongly agree*) with five statements. The statements included: “This exercise has helped me think about how to prepare for exams in the second half of the semester”, “I plan to change something about the way I prepare for exams based on this exercise”, “As a result of this exercise, I now feel more confident that I can improve my performance over the second half of the semester”, “As a result of this exercise, I have a better sense of what I need to do to improve my performance over the second half of the semester” and “This exercise has motivated me to work harder in the second half of the semester”. All midterm wrapper materials, including the assignment questions and the performance worksheet are available at this link: https://tinyurl.com/midtermwrapper

Procedure

After submitting midterm grades following the end of the eighth week of the sixteen-week semester, instructors sent a Blackboard announcement that also went to students’ email, inviting them to complete an online assignment designed to help them improve their course performance in exchange for five extra credit points. The email contained an attachment with the performance worksheet and a Qualtrics link to the midterm wrapper assignment. Students first filled out the performance worksheet, which they did not turn in, and then answered the questions on the midterm wrapper assignment. Students had one week to submit the assignment. Recognizing that not all students read their email regularly, instructors also created a tab in Blackboard (labeled ‘Midterm Wrapper Assignment’), containing instructions, the performance worksheet and the assignment link, and made announcements in class about how to access the assignment.

Results

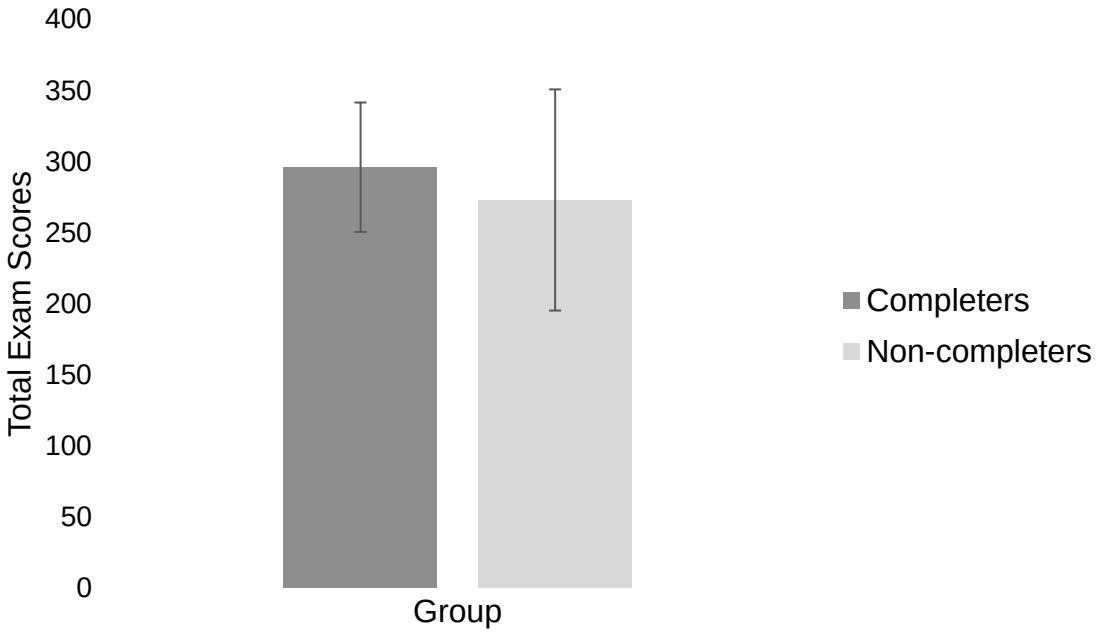
Midterm Wrapper Completion and Pre-Midterm Performance

Of 778 total students, 402 (51.67%) completed the midterm wrapper assignment in exchange for extra credit. As expected, students who completed the midterm wrapper scored significantly more points on the first two exams at midterm (M = 182.39, SD = 28.66) than those who did not complete the midterm wrapper (M = 175.09, SD = 34.37), $t(776) = 3.23$, $p = .001$, $d = .231$. At midterm, students who completed the midterm wrapper had also completed more homework assignments (M = 5.84, SD = .49) compared to those who did not complete the midterm wrapper (M = 5.30, SD = 1.33), $t(776) = 7.60$, $p < .001$, $d = .546$, and had earned more total points (M = 328.98, SD = 45.27, vs. M = 300.03, SD = 64.60), $t(773) = 7.26$, $p < .001$, $d = .52$. Thus, all hypothesis tests were conducted controlling for prior performance using ANCOVA, and both raw and adjusted means are presented below.

Post-Midterm Exam Performance

As hypothesized, controlling for pre-midterm exam performance, students who completed the midterm wrapper performed significantly better on the final three exams (M = 296.05, SD = 45.52) than did those who did not complete the assignment (M = 272.99, SD = 77.80; see figure 1), $F(1, 774) = 16.46$, $p < .001$, $\eta_p^2 = .021$. The mean difference in post-midterm exam performance was approximately 13 points (out of 400 possible) after adjusting for pre-midterm exam performance (M_{adj} = 291.43 vs. 277.94). Midterm wrapper completers also performed significantly better on each of the final three exams when analyzed individually, $p_{Exam\ 3} = .03$, $p_{Exam\ 4} < .001$, $p_{Final\ Exam} < .001$, compared to non-completers. The third- and fourth-unit exams (the two that occurred post-midterm) were worth 120 points each, while the cumulative final exam was worth 160 points. Table 1 contains raw and adjusted means and mean differences by midterm wrapper completion for each post-midterm exam. Remarkably, examining both raw and adjusted mean differences reveals that, if anything, the effect of the midterm wrapper assignment on exam performance increased over time.

Figure 1: Total exam scores post midterm wrapper for completers and non-completers



Note. Total exam scores include exam 3, exam 4, and the final exam scores (400 points available combined). Error bars show standard deviation for each group.

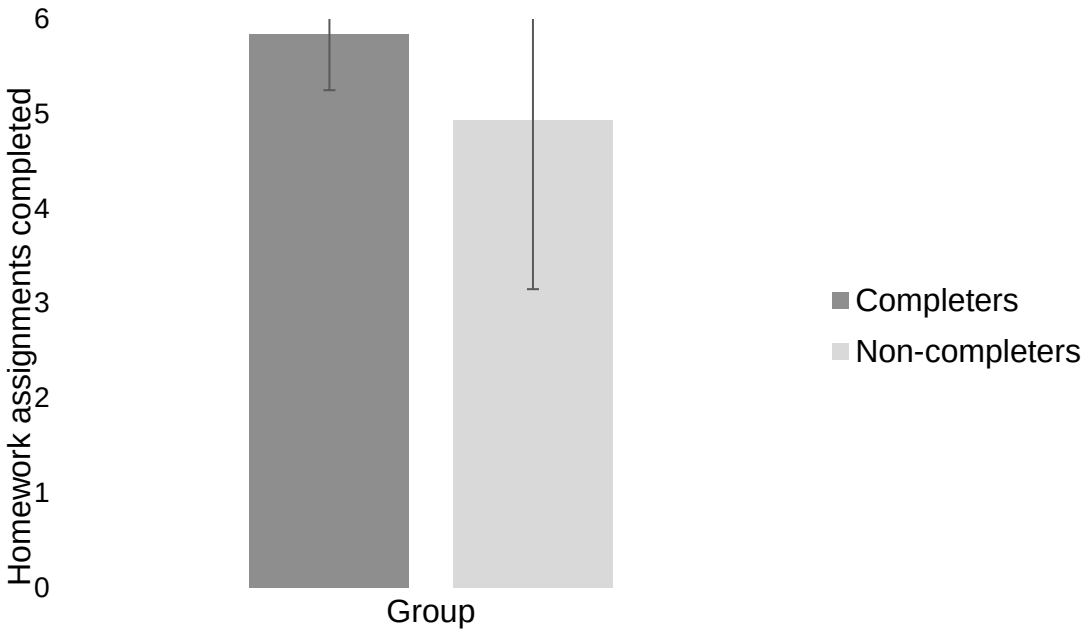
Table 1: Raw and adjusted mean post-midterm exam performance by midterm wrapper assignment completion

Exam	Total Points	$M_{Completers}$	$M_{Non\text{-}completers}$	M_{diff}	$M_{adj\ Completers}$	$M_{adj\ Non\text{-}completers}$	$M_{diff\ adj}$
Exam 3	120	90.74	85.39	5.35	89.38	86.84	2.54
Exam 4	120	88.66	81.44	7.22	87.49	82.71	4.78
Final Exam	160	116.65	106.66	9.99	114.80	108.65	6.15
All Exams Post-midterm	400	296.05	272.99	23.06	291.43	277.94	13.49

Post-midterm homework completion

As predicted, controlling for pre-midterm homework assignment completion, students who completed the midterm wrapper assignment (M = 5.84, SD = .59) also completed significantly more of the final six online homework assignments than did those who did not complete the assignment (M = 4.93, SD = 1.78; see Figure 2), $F(1, 772) = 41.61$, $p < .001$, $\eta_p^2 = .051$. The mean difference in the number of post-midterm homework assignments completed was approximately .5 after adjusting for pre-midterm homework assignment completion (M_{adj} = 5.66 vs. 5.14).

Figure 2: Homework completion post midterm wrapper for completers and non-completers



Note. There were six total homework assignments after the midterm wrapper assignment. Error bars show standard deviation for each group.

Final Grades

Perhaps most importantly, after adjusting for points earned pre-midterm, students who completed the midterm wrapper assignment earned significantly higher final grades (M = 829.54, SD = 97.84) than did those who did not complete the assignment (M = 731.86, SD = 173.76), $F(1, 772) = 41.53$, $p < .001$, $\eta_p^2 = .051$. The mean difference was approximately 4% (i.e., nearly half a letter grade) after adjusting for pre-midterm points (M_{adj} = 799.95 vs. 764.42).

Although this finding suggests that the midterm wrapper assignment has the potential to increase final grades, a possible alternative explanation could simply be the completion of more online homework assignments (which required students to read each chapter and subsequently answer questions about the content presented in those chapters) rather than the midterm wrapper assignment itself. To investigate this possibility, we ran partial correlation analyses on the relationship between post-midterm homework assignment completion and performance on each post-midterm exam, controlling for pre-midterm exam performance and number of homework assignments completed pre-midterm. We found that post-midterm homework completion did indeed predict post-midterm exam performance, $r_{pExam\ 3} = .24$, $p < .001$; $r_{pExam\ 4} = .39$, $p < .001$;

$r_{pFinal\ Exam}$ = .39, p < .001. Given that students who completed the midterm wrapper assignment did more homework assignments post-midterm, it is clear that greater completion of homework helps explain the superior exam performance of midterm wrapper assignment completers relative to those who opted out of the assignment. Notably, there was no indication that this effect of the midterm wrapper assignment faded by the end of the semester.

Perceptions of Midterm Wrapper

Students who completed the midterm wrapper perceived the assignment to be an inspiration for improved performance, with means on the final five items on the midterm wrapper (*e.g*., "This exercise has motivated me to work harder in the second half of the semester") ranging from 5.79 to 5.94 on a seven-point Likert-type scale. These items were highly correlated (α = .87), and thus a composite scale was computed. Notably, self-reported points at midterm correlated negatively with the composite scale (r = -.20, p < .001) and four out of five of the individual items (rs = -.07 to -.33), suggesting that lower-performing students more strongly believed that the midterm wrapper would lead to grade-enhancing behavioral change going forward.

Discussion

Providing students with performance feedback is essential to helping students, particularly weaker students, to know what types of adjustments they need to make to improve their likelihood of academic success (Hattie and Timperly, 2007). Theoretically, midterm grades may serve to let students know their standing in a course while there is still time to make necessary adjustments to their academic behaviors. Unfortunately, a grade alone, with no additional guidance, can be of limited use for students (Donelly, 2010). This is partially because even if students recognize that they need to make adjustments, many lack an understanding of the specific study strategies that are actually effective at improving performance (Gurung, 2005; Gurung *et al*., 2012) and many have yet to develop an SRL approach to their academic work.

We therefore designed the midterm wrapper assignment as a way to walk students through the process of using midterm grade feedback in a manner that takes full advantage of that feedback and leads them to make changes in their academic behaviors that will result in improved performance over the second half of the semester. Results of the current study show the midterm wrapper assignment to be a simple yet effective way to encourage students to consider their past performance and make needed adjustments in time to improve their overall course performance by the end of the semester.

As hypothesized, students who completed the midterm wrapper assignment completed more of the final six online homework assignments (due after midterm) compared to students who opted out of the assignment. It is possible that completing the midterm wrapper (particularly, the performance worksheet portion of the assignment) helped students to understand better how their midterm grade was calculated and therefore helped them understand the relative weight of homework assignments. If students saw that they were leaving important points on the table when

they missed homework assignments, perhaps this motivated them to complete more post-midterm assignments. It is also possible that the process of responding with enthusiastic agreement to the 'inspirational' items at the end of the midterm wrapper (*e.g.*, "This exercise has motivated me to work harder in the second half of the semester") led students to improve their assignment completion rates as a result of commitment and consistency effects (Cialdini, 1984). Students had, in a sense, publicly committed to improved performance by agreeing to those items and were perhaps therefore motivated to maintain internal consistency by following through with that commitment and thus putting more effort into their post-midterm studies.

We also found support for our hypothesis that students who completed the midterm wrapper assignment would perform better on the exams that came after midterm than students who did not complete the assignment. Indeed, we found superior performance by students who completed the midterm wrapper on both post-midterm unit exams as well as the final exam compared to students who opted out of the assignment. It is possible that the midterm wrapper assignment both motivated students to study more hours and taught them how to study more effectively. Unfortunately, we do not have self-report data about students' post-midterm study habits and strategies that would allow us to examine this possibility empirically, so this would be a useful focus of future research on this assignment.

As hypothesized, we found that students who completed the midterm wrapper assignment earned significantly higher final grades in the course than those who did not complete the assignment. Specifically, students who completed the assignment ended the semester with an average final grade that was four percentage points higher (close to half a letter grade) compared to those who did not complete the assignment. This is particularly noteworthy, given 1) that most of our Introductory Psychology students (approximately 70%) are first-year students and 2) that first-year academic success plays an important role in retention and ultimate degree completion (Veenstra, 2009).

A limitation of the current study is the lack of random assignment. From its conception, we believed in the potential benefits of the midterm wrapper assignment and therefore did not think it would be ethical to withhold an opportunity to complete the assignment from some students in our Introductory Psychology classes. We thus decided to present the assignment as an optional extra-credit assignment and to then compare students who opted in with those who opted out of the assignment. Clearly, it is likely that there were motivational differences between our two groups of students, with those who completed the assignment likely having higher academic motivation levels compared to those who opted out. Our comparisons of pre-midterm performance suggest this was the case; students who completed the midterm wrapper completed more pre-midterm homework assignments and had earned more points at midterm than those who opted out of the assignment, suggesting higher levels of academic motivation among midterm wrapper completers. We therefore statistically controlled for the superior prior performance of midterm wrapper completers relative to non-completers in all analyses. Though it is still possible that there were other differences between the two groups that our analyses did not control for, we feel reasonably confident that our results show a true causal effect of midterm wrapper completion on subsequent student performance. Nevertheless, future research could include a measure of

academic motivation (*e.g.*, Vallerand *et al*.'s 1992Academic Motivation Scale) to examine how differences in motivation might influence students' responses to the midterm wrapper assignment.

It is worth noting that the five extra credit points students earned for completing the midterm wrapper assignment were unlikely to have appreciably contributed to the difference we found in final grades between those who completed the assignment and those who did not. We give all students an option to earn thirty extra credit points over the course of the semester (equivalent to 3% of the total points possible for the semester). Students can earn these points in multiple ways and there are far more extra credit points available to earn than the thirty points we allow. Thus, even if students opted out of the midterm wrapper assignment, they had ample opportunity to earn their thirty maximum points in other ways, and both the raw difference (M_{diff} = 97.68) and pre-midterm performance-adjusted difference ($M_{diff\ adj}$ = 35.53) in total points earned in the course (including extra credit) between completers and non-completers were well above both the extra credit point-value of the midterm wrapper assignment and the maximum number of extra credit points.

We find it particularly interesting that students who completed the midterm wrapper performed better on all post-midterm exams, including the cumulative final exam, which took place eight weeks after the midterm wrapper's due date. Moreover, as suggested by table 1, the beneficial effects of the midterm wrapper on exam performance may have accumulated rather than faded over time. We see this as evidence for the potential long-lasting effects of the midterm wrapper on performance and motivation. It would be interesting to follow up with students, beyond the course in which the midterm wrapper was assigned, to see if the improved performance associated with midterm wrapper completion both carried over into other courses and lasted beyond the semester in which it was completed. While such a follow-up might not be easy to conduct or be even feasible, future research might at least probe students at the end of the semester to get self-reports related to their perceptions of the generalizability and longevity of what they learned from the midterm wrapper assignment.

One reason why completing the midterm wrapper might lead to such lasting effects is that the process of completing the assignment might serve to change students' underlying beliefs about the purpose of academic feedback. That is, perhaps the process of completing an assignment that asks students to go through both the self-reflection and forethought phases of SRL helps students to see the value of academic feedback for improvement. Given that this sort of belief about feedback is predictive of self-regulatory processes and academic gains (Brown and Hirschfeld, 2008), it is possible that completing the midterm wrapper assignment leads students to use subsequent assessment feedback in the course in ways that lead to continual improvement. Future research might examine this possibility that the midterm wrapper serves to change students' beliefs about the value of assessment by including items from The Students' Conceptions of Assessment inventory (Brown, 2011).

In addition to examining the longevity and possible carryover effects of the midterm wrapper's benefits to students, future research might also ask if there may be a more opportune time to give this sort of self-reflective assignment than at midterm. While it is common to provide grade feedback at the approximate midpoint of the semester, some researchers suggest that such

feedback should come earlier in the semester, ideally within the first six weeks, to be maximally effective, and argue that mid-semester is often too late for students to make needed adjustments in study habits and strategies (Simmons, 2011). It thus might be worth examining the effectiveness of an assignment that asks students to reflect on course performance two to three weeks prior to midterm in a sixteen-week course as compared to the current midterm wrapper, which students complete after week eight.

Despite the noted limitation in experimental design, we find the results of the current study quite promising regarding the value of the midterm wrapper assignment. Providing students with a grade at midterm is a common practice within higher education, yet there is little evidence that students use this feedback in a way that helps them improve their study habits and course performance (Alley, 2002). Indeed, at our own institution, we have no way of knowing if students even look at their midterm grades. The midterm wrapper assignment asks students to engage deeply with their midterm grade feedback by carefully examining and then reflecting on their course performance over the first half of the semester and then writing out a plan for their study strategies during the second half of the semester. Our results show this assignment to be a simple and effective way to encourage students to consider their past performance and make necessary adjustments in time to improve their overall course performance.

The midterm wrapper is a flexible assignment that can be used in a wide range of courses in a variety of academic disciplines, including both high- and low-enrollment sections. Although our students complete the assignment online via Qualtrics, it could be deployed using a variety of free survey software, like SurveyMonkey, and, for instructors wanting to use a low-tech alternative, the midterm wrapper could easily be presented as an assignment students submit on paper.

In sum, we are pleased with the outcomes of the midterm wrapper assignment among our own students and believe the assignment can be of value to students at other institutions and in courses other than psychology. What began as an optional, extra-credit assignment is now a required part of our Introductory Psychology course curriculum. In our high-enrollment sections of the course, perhaps the greatest advantage of the midterm wrapper assignment is that, unlike our previous midterm meetings, we can make this assignment available to all students enrolled in the class, allowing every student to take advantage of its benefits. The assignment takes very little time on the part of the instructor to set up or to grade. We typically quickly read through responses, spending most of our time on the question that asks students what the course staff can do to help with their learning, but, even with over 300 students, that work can typically be done in under an hour. Particularly, when compared to the many hours we used to spend in one-on-one midterm meetings with a small subset of our students, we find the midterm wrapper assignment to provide much bang for its pedagogical buck. It takes very little time and effort on the part of the student or instructor, but, as our results show, it leads to impressive improvements in student performance.

Conclusion

The midterm wrapper assignment provides a simple way for instructors to encourage a self-regulatory approach to learning by showing students how to use midterm grade feedback to reflect on their own learning and to plan changes in their study habits while there is still time to improve their course performance. Results of our quasi-experiment showed the midterm wrapper assignment to be effective at raising students' subsequent exam scores, assignment completion rates and final grades in the course. This assignment can be used in a wide variety of courses and takes very little time on the part of students or the instructor.

Reference list

Alley, V.M. (2002) 'Midterm grade reports: Are they effective?' *Research and Teaching in Developmental Education*, 19(1), 14-24. Available at: https://www.jstor.org/stable/pdf/42802148 (Accessed: 21 September 2022).

Brown, G.T.L. and Hirschfeld, G.H.F. (2008) 'Students' conceptions of assessment: Links to outcomes.' *Assessment in Education: Principles, Policy and Practice,* 15(1), 3-17. Available at: https://doi.org/10.1080/09695940701876003 (Accessed: 1 June, 2023).

Brown, G.T. (2011) 'Self-regulation of assessment beliefs and attitudes: A review of the students' conceptions of assessment inventory.' *Educational Psychology: An International Journal of Experimental Educational Psychology*, 31(6), 731-748. Available at: https://doi.org/10.1080/01443410.2011.599836 (Accessed: 1 June 2023).

Chew, K.J., Chen, H.L., Rieken, B., Turpin, A. and Sheppard, S. (2016) 'Improving students' learning in statics skills: Using homework and exam wrappers to strengthen self-regulated learning.*' The ASEE 123rd Annual Conference & Exposition*. New Orleans, LA, United States, 26-29 June 2016. Available at: https://peer.asee.org/improving-students-learning-in-statics-skills-using-homework-and-exam-wrappers-to-strengthen-self-regulated-learning.pdf (Accessed: 21 September 2022).

Cialdini, R. (1984) *Influence: The psychology of persuasion*. New York, NY: HarperCollins. ISBN: 9780061241895

Craig, M., Horton, D., Zingaro, D. and Heap, D. (2016) 'Introducing and evaluating exam wrappers in CS2.' *The 47th ACM Technical Symposium on Computing Science Education*. Memphis, TN, United States, 2-5 March 2016. Available at: https://dl.acm.org/doi/10.1145/2839509.2844561 (Accessed: 2 October 2022).

Dent, A.L. and Koenka, A.C. (2016) 'The relation between self-regulated learning and academic achievement across childhood and adolescence: A meta-analysis.' *Educational Psychology Review*, 28, 425-474. Available at: https://doi.org/10.1007/s10648-015-9320-8 (Accessed: 27 May 2023).

Dignath, C., Buettner, G. and Langfeldt, H.P. (2008) 'How can primary school students learn self-regulated learning strategies most effectively?: A meta-analysis on self-regulation training programmes.' *Educational Research Review*, 3(2), 101-129. Available at: https://doi.org/10.1016/j.edurev.2008.02.003 (Accessed: 1 June 2023).

Dignath, C. and Büttner, G. (2018) 'Teachers' direct and indirect promotion of self-regulated learning in primary and secondary school mathematics classes–insights from video-based classroom observations and teacher interviews.' *Metacognition and Learning*, 13, 127-157. Available at: https://doi.org/10.1007/s11409-018-9181-x (Accessed: 1 June, 2023).

Donnelly, R. (2010) 'Harmonizing technology with interaction in blended problem-based learning.' *Computers & Education*, 54(2), 350-359. Available at: https://doi.org/10.1016/j.compedu.2009.08.012 (Accessed: 20 September 2022).

Edlund, J.E. (2020) 'Exam wrappers in psychology.' *Teaching of Psychology*, 47(2), 156-161. Available at: https://doi.org/10.1177/0098628320901385 (Accessed: 5 October 2022).

Gezer-Templeton, P.G., Mayhew, E.J., Debra, S.K. and Schmidt, S.J. (2017) 'Use of exam wrappers to enhance students' metacognitive skills in a large introductory food science and human nutrition course.' *Journal of Food Science Education*, 16(1), 28-36. Available at: https://doi.org/10.1111/1541-4329.12103 (Accessed: 5 October 2022).

Gurung, R.A.R. (2005) 'How do students really study (and does it matter)?' *Teaching of Psychology*, 32(4), 239-241. Available at: https://doi.org/10.1207/s15328023top3204_8 (Accessed: 10 January 2020).

Gurung, R.A.R., Daniel, D.B. and Landrum, R.E. (2012) 'A multisite study of learning in introductory psychology courses.' *Teaching of Psychology,* 39*(*3), 170-175. Available at: https://doi.org/10.1177/0098628312450428 (Accessed: 20 September 2022).

Guven, M. and Babayigit, B.B. (2020) 'Self-regulated learning skills of undergraduate students and the role of higher education in promoting self-regulation.' *Eurasian Journal of Educational Research*, 20(89), 47-70. Available at: https://dergipark.org.tr/en/download/article-file/1361788 (Accessed: 2 June 2023).

Hattie, J. and Timperly, H. (2007) 'The power of feedback.' *Review of Educational Research*, 77(10), 81-112. Available at: https://doi.org/10.3102/003465430298487 (Accessed: 1 June, 2023).

Hanover Research (2014) *Early alert systems in higher education*. Available at: https://www.hanoverresearch.com/wp-content/uploads/2017/08/Early-Alert-Systems-in-Higher-Education.pdf (Accessed: 15 September 2022).

Ho, E.S.C. (2004) 'Self-regulated learning and academic achievement of Hong Kong secondary school students.' *Education Journal*, 32(2), 87-107. Available at: http://www.fed.cuhk.edu.hk/~hkcisa/articles/Ho_2004_ej_v32n2_87-107.pdf (Accessed: 4 June 2023).

Lovett, M.C. (2013) 'Make exams worth more than the grade: Using exam wrappers to promote metacognition.' In: Silver, N., Kaplan, M., LaVague-Manty, D. and Meizlish, D. (eds.), *Using reflection and metacognition to improve student learning: Across the Disciplines, Across the Academy*. Sterling, VA, United States: Stylus Publishing, 18-52. ISBN: 1579228259

Mega, C., Ronconi, L. and De Beni, R. (2014) 'What makes a good student? How emotions, self-regulated learning, and motivation contribute to academic achievement.' *Journal of Educational Psychology,* 106(1), 121-131. Available at: https://doi.org/10.1037/a0033546 (Accessed: 29 May 2023).

Miller, T.M. and Geraci, L. (2011) 'Unskilled but aware: Reinterpreting overconfidence in low-performing students.' *Journal of Experimental Psychology Learning Memory and Cognition*, 37(2), 502-506. Available at: https://doi.org/10.1037/a0021802 (Accessed: 22 September 2022).

Panadero, E. (2017) 'A review of self-regulated learning: Six models and four directions for research.' *Frontiers in psychology*, 422. Available at: https://doi.org/10.3389/fpsyg.2017.00422 (Accessed: 29 May 2023).

Russell, J.M., Baik, C., Ryan, A.T. and Molloy, E. (2022) 'Fostering self-regulated learning in higher education: Making self-regulation visible.' *Active Learning in Higher Education*, 23(2), 97-113. Available at: https://doi.org/10.1177/1469787420982378 (Accessed: 1 June 2023).

Simmons, J.M. (2011) *A national study of student early alert models at four-year institutions of higher education.* Ph.D. Thesis, Arkansas State University. Available at: https://eric.ed.gov/?id=ED535792 (Accessed: 17 September 2020).

Trumbull, E. and Lash, A. (2013) 'Understanding formative assessment: Insights from learning theory and measurement theory.' *WestEd*, 1-20. Available at: https://www.wested.org/online_pubs/resource1307.pdf (Accessed: 6 October 2022).

Vallerand, R.J., Pelletier, L.G., Blais, M.R., Briere, N.M., Senecal, C. and Vallieres, E.F. (1992) 'The Academic Motivation Scale: A measure of intrinsic, extrinsic, and amotivation in education.' *Educational and Psychological Measurement*, 52(4), 1003-1017. Available at: https://doi.org/10.1177/0013164492052004025 (Accessed: 1 June 2023).

Veenstra, C.P. (2009) 'A strategy for improving freshman college retention.' *The Journal for Quality and Participation*, 31(4), 19-23. Available at: JQP+article+long.pdf (squarespace.com) (Accessed: 20 September, 2022).

Villano, R., Harrison, S., Lynch, G. and Chen, G. (2018) 'Linking early alert systems and student retention: A survival analysis approach.' *Higher Education*, 76, 903-920. Available at: https://doi.org/10.1007/s10734-018-0249-y (Accessed: 15 September 2022).

Zimmerman, B.J. (2000) 'Attainment of self-regulation: A social cognitive perspective.' In: Boekaerts, M., Pintrich, P.R. and Zeidner, M. (eds.) *Handbook of Self-Regulation.* San Diego, CA: Academic Press, 13-39. ISBN: 0123695198

Zimmerman, B.J. (2011) 'Motivational sources and outcomes of self-regulated learning and performance.' In: Zimmerman, B.J. and Schunk D.H. (eds.) *Handbook of Self-Regulation of Learning and Performance.* New York: NY, United States: Routledge/Taylor and Francis Group, 63-78. ISBN: 9780203839010