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Goal-Setting & Reflection Surveys for High School: Research Foundations for Advanced Placement Courses

Introduction

Self-regulated learning and metacognitive skills are crucial for students to effectively manage their learning process, enabling them to set goals, monitor progress, and adjust strategies as needed. These skills foster independence and critical thinking, essential for academic success. Macmillan Learning/Bedford, Freeman & Worth (ML/BFW) created the Goal-Setting and Reflection Surveys to enhance these abilities.

This tool is incorporated into BFW's new online courseware solution, Achieve. The Goal-setting and Reflection Surveys (GRS) are a series of quick, actionable pre-built surveys located in Achieve's Resources tab. There are five total surveys available: an "Introduction" survey, and four follow-up "Checkpoint" surveys. Each survey is designed to get students to set goals for themselves and reflect on their learning throughout the school year. The survey presents students with instructional content on metacognitive skills, prompting them to reflect on their goal progress, the strategies employed, and the effectiveness of those strategies.

When assigned, each survey offers insights into students' strategies and their perceived progress, which enables teachers to tailor individual interventions and better meet the whole class's needs. Each survey contains multiple-choice and multiple-select questions, with a few free responses, and typically takes students about 5-10 minutes to complete.

In the 2023-24 school year, the ML/BFW Learning Sciences and Insights (LSI) team conducted a research study with several AP teachers and classrooms across the U.S. Teachers and their students tested our existing surveys, originally created for college students. During the study, teachers expressed a need for survey question rationale and the underlying research to support assigning them to students and interpreting responses. They also suggested shortening the surveys to facilitate completion during class time, as some preferred this to assigning the surveys as homework. In response to this feedback, we eliminated eight questions deemed less relevant or engaging by teachers from both the introductory and checkpoint surveys. Additionally, we revised three questions and streamlined the list of strategies presented to students–all based on teacher suggestions–to ensure the surveys were suitable for high school students. Additionally, the college introduction survey had 15 questions, which was reduced to 13 for high school, and the checkpoint survey questions were reduced to 29 questions from the original 35.

AP classes aim to mirror the complexity and depth of college courses, offering a more intensive curriculum than standard high school classes. Given this higher difficulty, the LSI team's research on Goal-Setting & Reflection Surveys, originally conducted in colleges and universities, is also applicable to AP classes. This research investigated how survey completion correlates with course and exam performance, student engagement, and motivation.

To initially test and refine the surveys, the LSI team conducted a series of studies in public and private colleges and universities offering 2-and 4-year degrees across five semesters (2019- 2021) and 115 institutions to examine the impact of the surveys on course grades (see Figure 1). We anticipate observing comparable outcomes within AP student cohorts. this document, we present recommendations for implementing the surveys based on more recent internal research. A summary of recent research with colleges and university students using the GRS is highlighted in this document, following the literature review and Insights from Student Responses sections.

In this literature review, we briefly discuss the relevant published literature to demonstrate the value of the questions and instructional content in the GRS. This includes self-regulated learning and the phases of metacognitive strategies alongside a selection of questions from the surveys.

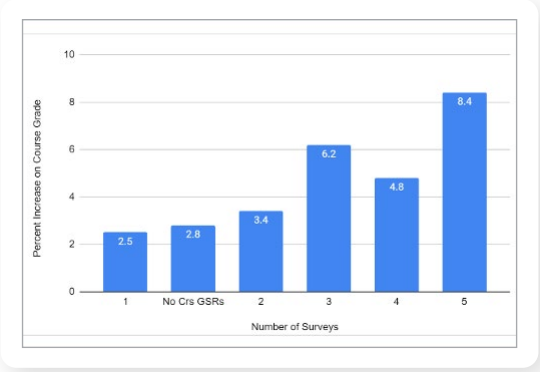

Figure 1.

Self-Regulated Learning and Metacognition

Success in school depends on skills beyond cognition and prior knowledge, including strategy use and maintaining motivation. Students must set goals, engage with instruction, enact effective strategies, monitor progress, and seek help and resources when needed (Zimmerman & Schunk, 2001, 2018; Schunk & Ertmer, 2000). The regulation of cognitive, motivational, behavioral, and emotional processes involved in learning is known as self-regulated learning (SRL). Students commonly struggle with the self-awareness required to think about their thinking (i.e., metacognition) that SRL requires.

Metacognition aids students in analyzing new situations, identifying which resources and strategies are helpful in this situation, determining how to apply them best, and then assessing and adjusting as necessary, often leading to better academic outcomes (Conley, 2014). Learners who display or report using more metacognitive skills have higher conceptual knowledge, test performance, class grade, GPA, adaptive strategy use, knowledge transfer to new contexts, college enrollment, and graduation rates.

Students in AP and other high school courses continue to develop metacognitive skills and need regular feedback about how well they are monitoring and evaluating strategies (Conley, 2014; Greene, Bolick, Caprino, Deekens, McVea, Yu, & Jackson, 2015). In fact, high school students' SRL skills appear to be influenced by factors including teacher support, recognizing and setting task-oriented goals, and noticing relevance outside of the classroom (Kesuma, Retnawati, & Putranta, 2021). Some deficiencies in their SRL skills may include students needing explicit direction to do something, a lack of recognition of the importance of learning goals, and learning emotional management. To improve their SRL skills, students need opportunities for guided reflection on goals and knowledge.

The GRS include both support and instruction for three phases or groups of metacognitive strategies (identified by Schraw, 1998): setting goals and plans in the forethought phase, monitoring in the performance phase, and evaluating in the self-reflection phase (Figure 2). Planning includes forethought, where learners set goals, identify critical features around tasks, and plan strategies. Students then move to monitoring their performance and comprehension, tracking their strategy use, and monitoring their progress toward a goal. Finally, students evaluate whether they reached their goals and followed plans, review the strategies they used and the success of those strategies with support and feedback, seek help on learning new strategies, and set new or updated goals. Dignath (et al., 2008) suggest a relationship between strategy use and performance, supporting the argument for instruction around learning strategies. By providing students with the opportunity to display and practice personal academic autonomy in setting and monitoring goals, students' self-motivational beliefs may increase (Wigfield & Eccles, 1992).

Figure 2 summarizes some of the metacognitive processes involved in the three phases. Depending on the task or objective, strategies from any or all three phases may be used. Over the longer term, such as throughout a project, unit, or academic term, students can cycle through these phases multiple times, incorporating lessons they learned.

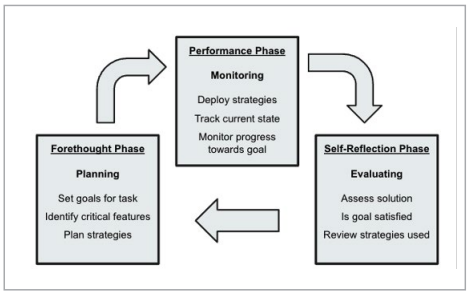

Figure 2.

Goal Setting and Planning

Creating goals and plans at the beginning of the school year allows students to reflect on their purpose and set motivating checkpoints. Planning falls into the forethought phase of SRL, where a learner is responsible for setting goals for a class or task and identifying critical features and strategies to accomplish those goals. Setting task-specific goals, like performing well on a project or test, gives students self-generated criteria against which they can assess and monitor their learning.

Identifying a task's critical features allows students to search their memory for relevant prior knowledge before they begin, review their options for the task, plan their time to accomplish each stage, judge the relevance of the task, and how easy or difficult it will be to complete. This sets the stage for recognizing what learning strategies they can use, how they can be performed, and when and why to use them.

To support students in their knowledge and practice of setting goals and plans for your course, the GRS asks students, for example:

1. **What grade are you willing to work to achieve in this class?**
2. **Estimate how many hours per week you plan to spend on studying or completing assignments for this class (excluding class time).**

Forming goals around learning is also linked to improved learning-related behaviors, such as time management skills (Zhu, 2021). To support students in their goal- and plan-setting practice, the GRS also includes descriptions of strategies to choose from (Figure 3).

Figure 3.

Strategies

The GRS includes student-facing study strategies first presented in the Introduction Survey and revisited in the checkpoints. Students are asked to consider each strategy and how they might employ it in their studies. In the checkpoint surveys, students are asked to reflect on how often they used the strategies in recent weeks and what worked (or did not work) for them.

Spacing

The first category of strategies is spacing out study times to enhance long-term memory. Evidence suggests that cramming is highly ineffective, especially if the goal is to remember the material over weeks or months. In contrast, research demonstrates that spreading out study sessions over weeks rather than days helps improve exam performance and enhances long-term memory retention (e.g., Gezer-Templeton, Mayhew, Korte, & Schmidt, 2017) (Figure 4).

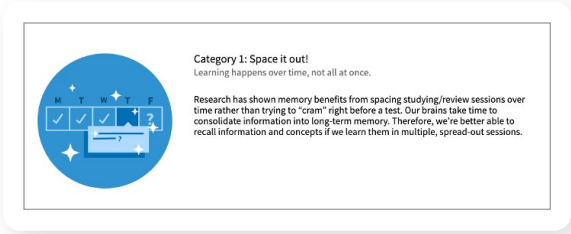

Figure 4.

Retrieval Practice

Retrieval practice, or recalling information that was previously learned, is the second research-backed category of strategies. To students, we present this as a way to challenge themselves. Research has shown that practicing recall of information, or retrieval practice, such as taking practice exams, is a very impactful study strategy (Roediger & Karpicke, 2006). Yet many students do not use this skill to its full effect (Cogliano et al., 2019). Cogliano and colleagues (2019) suspect this could be because many students do not judge their progress and performance accurately (Grimaldi & Karpicke, 2012; Rawson & Dunlosky, 2007).

Learning requires us to incorporate new information into what we already know (Figure 5). Being able to generate explanations of how new information is connected to what we already know helps this process. There is a wealth of research that has shown that self-explanation helps students more deeply learn concepts and transfer that learning to course performance outcomes (e.g., Dyer, Hudon, Montpetit-Tourangeau, Charlin, Mamede, & Gog, 2015; Scheiter, Schleinschok, & Ainsworth, 2017).

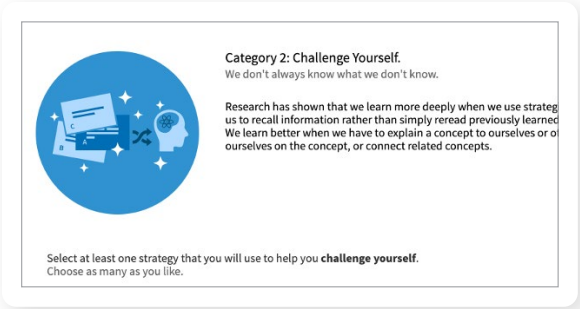

Figure 5.

Self-testing leads to better memory of the material; however, research suggests that many students study by rereading their books or class notes (Yang, Razo, & Persky, 2019). Retrieval practice forces students to get information out by bringing it to mind. This process has been shown to strengthen one's memory of that information and decrease the chances of forgetting (Karpicke & Roediger, 2008). Hundreds of studies have replicated this effect in various contexts; when participants either reread a passage or test themselves on that passage, those who tested themselves outperform those who reread. The improved performance is long-lasting, up even weeks later (e.g., Roediger & Butler, 2011; Ariel & Karpicke, 2018).

Seeking outside help

Navigating academic resources and juggling multiple priorities and outside responsibilities can be a struggle for AP students. As they learn about complex topics and complete more rigorous coursework, students must recognize when and how to seek effective help. Within the GRS, students are introduced to the concept and research behind seeking help and are provided with a list of potential strategies. Students are later asked to reflect on their strategies and which worked best for them within the checkpoint surveys. Research on this topic suggests that students who reach out for help and resources when they're struggling tend to learn more deeply and receive higher grades than those who do not (Levy Cohen & Zusho, 2023; Ryan, Gheen, & Midgley, 1988) (Figure 6).

Figure 6.

Many factors influence students' willingness to seek help, such as academic efficacy, adopting a growth mindset, and classroom climate (Ryan et al., 1998). Evidence also supports a link between students' attitudes and perceptions of the social environment and their help-seeking behaviors, suggesting that changing student norms and attitudes can promote help-seeking behaviors among adolescents (Pisani, Schmeelk-Cone, & Gunzler, Petrova, Goldston, Tu, & Wyman, 2012). Academic help-seeking attitudes are closely related to students' school functioning and successful outcomes, highlighting the significance of help-seeking as a self-regulation strategy (Dueñas, Figuerola, & Castarlenas, 2021).

Optimizing Study Environment

Research suggests that optimizing one's study environment and getting adequate rest are important to the retention of learning over time (Cousins, Wong, & Chee, 2019; Smith & Vela, 2001). There is also evidence that trying to multi-task is not effective as people cannot split their attention, but students will still try (Rosen, 2017). Further, on average, teens check their smartphones and/or social media every fifteen minutes, which causes them to take longer to study and feel more stressed (Bowman, Levine, Waite, & Gendron, 2010) (Figure 7).

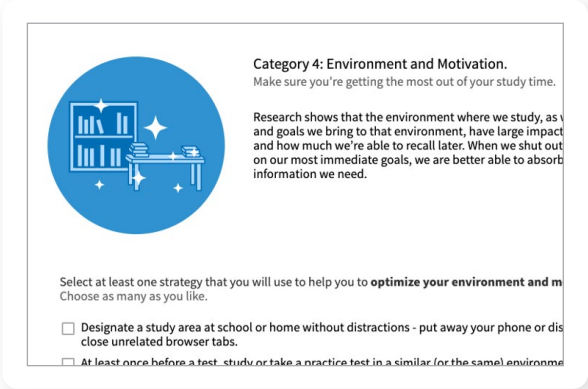

Figure 7.

Instead, in the GRS, we communicate to students the importance of limiting distractions and trying to create a quiet environment in which to focus on studying. Additionally, studying in an environment that is similar to a classroom or test-taking environment can improve the recall of information (Smith & Vela, 2001). In other words, it's easiest to recall information in the context where it was learned. By trying to replicate a testing environment while studying, a student may be better able to recall information while in that actual environment.

Monitoring

Self-monitoring skills fall into the performance phase of SRL, where an individual is responsible for tracking their current performance, deploying learning strategies, and tracking their progress toward a goal. To do this, students must recognize whether they understand information and identify gaps in their knowledge to select a strategy to bring performance closer to the goal. Teachers, peers, or an online tool can assist by providing information related to a student's current performance and how to close any gap between where they are and their goals (Hattie & Timperley, 2007).

Monitoring skills can be broken down into self-control skills, such as self-instruction or attention focusing, and self-observation skills, such as self-recording and systematically varying behaviors to change performance. To support students' monitoring of their goals and plans for your course, the Goal-Setting and Reflection Survey asks students:

1. **Are you currently on track to accomplish your goals for this class?**
2. **On a scale of 1-5, how confident are you that you can either get back or stay on track?**

A student's ability to adapt problem-solving behaviors in response to academic tasks and feedback is critical for successful learning and achievement. Improving their ability to monitor tasks can make students more aware of their ability to control their learning and better equip them to self-manage their resources. Accurate monitoring has been shown to improve performance and be an important predictor of student success (Pintrich & Groot, 1990; Rivers, et al., 2020).

Evaluating

Evaluating goals and plans falls into the self-reflection phase of metacognitive strategies. This includes students determining if they are satisfied with their performance, reviewing their strategies for studying and learning and their usefulness, and adjusting future goals and strategies with support as necessary. Self-reflective metacognitive skills are important to developing SRL behaviors during the learning process, as are students' attributions about their failures and successes (Driscoll, 2000). Students' sense of self-efficacy is supported when they reflect on even a small success or 'win' and feel encouraged to continue in their efforts (Zimmerman & Schunk, 2001).

The GRS provides scaffolding for learners' skills by prompting them to reflect on the performance of tasks or activities by considering their strategies and what they learned. Several studies found that students grew their metacognitive skills when

provided with a structure for reflection via journaling or another tool (Butler, 2002; Kurt & Kurt, 2017; Paris & Winograd, 2003).

To support students' evaluation of meeting their goals and plans in your course, the GRS asks students, for example:

1. **How often did you study or work on class assignments without any distractions? This could include finding a quiet place similar to a test environment, studying without your phone, and closing extra browser tabs.**
2. **How often did you get help from your teacher or outside resource?**

In some SRL-focused interventions, training was more effective if it included and promoted reflection (Dignath & Büttner, 2008; Donker et al., 2014), demonstrating how important it is to provide support and time for reflection.

Insights from Student Responses

For each survey that you assign, there will be a complete summary of the responses and relevant insights when you select a particular assignment from the drop-down (Figure 8). There are currently nine insight cards, each with charts or metrics centered on a related topic or just a single question from the surveys. You can drill down further into each card to view every student's responses to each of the questions associated with that card. Introduction and Checkpoint survey card data differ slightly in terms of the types and numbers of questions asked.

Navigate to the GRS insight cards by clicking on the left-hand navigation panel and selecting reports.

You may see that the Responses tab of each individual survey assignment does have data and that you may access individual student responses in this way. However, to gain the full benefits of insights from the aggregate of student responses, visit the Reports > Insights tab of Achieve and look for an area titled Goal-setting and Reflection Responses.

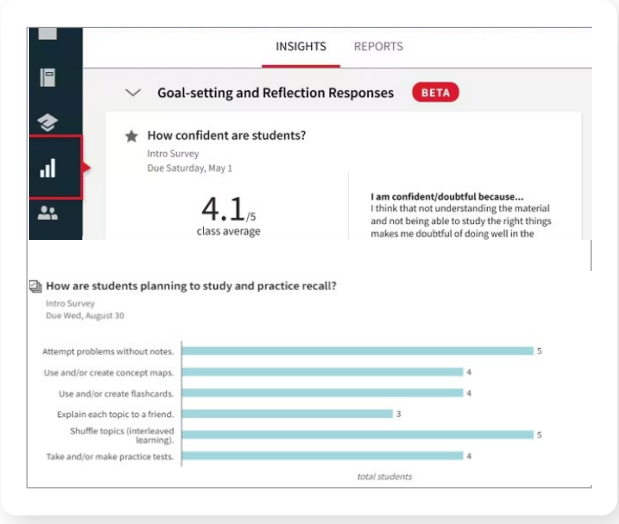

Figure 8.

Macmillan Learning Research Results

Macmillan Learning funded a series of research studies across five semesters (2019-2021) and 115 higher education to examine the impact of the surveys. Participating instructors were given implementation recommendations, but the use of GRS was not required to participate in the study, and implementation choices varied by the instructor. Prior to data collection, this study and the associated consent forms and instruments were reviewed and approved by the Human Resources Research Organization (HumRRO). HumRRO is an accredited, third-party Institutional Review Board organization with no affiliation with Macmillan Learning.

The total study sample included 136 unique instructors teaching 292 courses. Eight different subject areas (chemistry, biochemistry, biology, calculus, precalculus, psychology, economics, and English) are represented in the study. Instructors came from 115 institutions across 32 states and Canada. The sample included a range of institution and course sizes and formats (i.e., face-to-face, virtual synchronous, virtual asynchronous). The variation in participating institutions and instructors enabled a diverse student sample. The student sample included 47% non-White or Asian, 22% who were the first in their families to go to college, 65% who were eligible for financial aid, and 31% who had a high school GPA lower than 3.5 across a total of 7,225 participating students.

Course Performance

The results suggested that students completing two or more of the assigned GRS performed higher on their final grades by 8% compared to students who did not complete surveys. The results also suggested that students who completed only one survey performed similarly to students who did not complete any surveys. In further semesters, instructor usage of the GRS increased, and students also began completing more of those assigned surveys.

Figure 1 at the beginning of this document displays student course performance by the number of GRS completed. A total of 2,529 students were in classes that had at least one survey assigned by their instructor during the semester. As demonstrated by the graph and further supported by model results, students who completed two or more GRS

assignments performed significantly better in their courses than students who only completed one survey or didn't complete any surveys ($p < .05$).

We recommend students complete the Introductory GRS to set goals and then monitor and evaluate by completing at least one Checkpoint Survey. Based on our results, at least two checkpoint surveys must be completed to impact students' course performance.

Motivation

Students' motivation, including academic self-efficacy and academic engagement, was assessed in two additional surveys given at the beginning and end of the semester. While the GRS were not designed to impact these motivational constructs directly, the researchers hypothesized that promoting SRL and metacognition could also lead to students feeling more confident and engaged in their courses.

Self-efficacy was reported on a 7-point Likert scale, which included 11 survey items, such as "How confident are you that you can finish homework assignments by the deadline?" Engagement was reported on a 5-point Likert scale measuring cognitive, behavioral, and emotional components of academic engagement. It included nine survey items such as "During this course, I enjoyed learning new things.'' Measures of internal consistency found the scales to be reliable measurements, with Cronbach's alpha coefficients of $r = 0.89$ and $r = 0.76$.

Results revealed that students completing the Introductory Survey and at least one Checkpoint Survey had significantly higher self-reported self-efficacy and academic engagement, particularly emotional engagement ($p<.001$) (Figures 9 and 10). Students who completed a checkpoint survey moved closer to feeling "very confident" in their ability to complete their coursework than those who didn't. Furthermore, students who completed a checkpoint survey moved closer to "often" feeling emotionally engaged in the course than those who didn't.

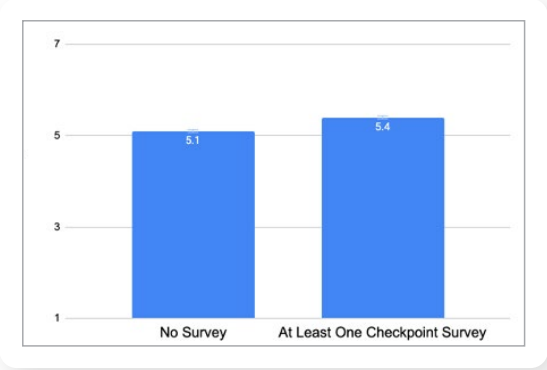

Figure 9. Self-efficacy by Completion of at Least One Checkpoint Survey

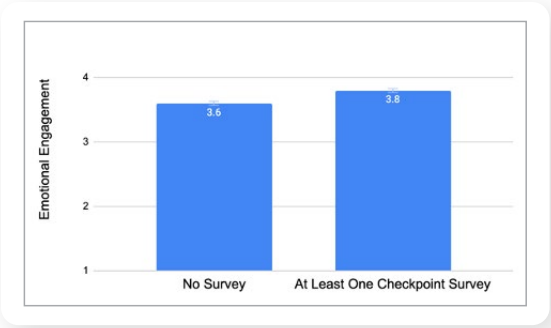

Figure 10. Emotional Engagement by Completion of at Least One Checkpoint Survey

The results suggest that not only do the surveys help students perform better in their course, but they also help students to feel more confident that they can accomplish the necessary course tasks and feel more engaged while doing so. Empowering students to plan, monitor, and evaluate their course performance may facilitate these motivational beliefs.

Perceptions of Goal-Setting and Reflection Surveys

The fall 2021 student surveys also included questions about students' perceptions of the value and usefulness of the GRS. Table 1 summarizes the survey results:

Table 1. Fall 2021 Student Survey Results

Survey Item	Agree/ Strongly Agree	Neutral
The surveys helped me improve as a student this semester.	75%	19%
The surveys were a valuable use of my time.	62%	25%
The surveys helped me think about my goals/learning habits in and outside of class.	80%	15%
The surveys helped me learn something new about how I can manage my time, studying, or learning.	79%	15%

Of the 780 students from that semester who reported completing at least one Goal Setting and Reflection Survey, results revealed that students generally perceived the GRS as helpful for their learning. Finally, based on our research into the implementation of these surveys, we offer some tips for using them in your classroom.

Recommendations for Implementation

- Introduce the surveys in class before assigning them and discuss the value of thoughtful, honest reflection on their schoolwork and strategy use. This will give students a better idea of what to expect and let them know you're reading responses.
- Assign the surveys for credit so that students take them seriously and are motivated to complete them.
- The introduction survey should be assigned around the beginning of the school year or term. We recommend reviewing students' responses to get a better idea of who they are in and outside of the classroom.
- The checkpoint surveys should be assigned after each major test or exam. This gives students a chance to reflect on their performance and compare it to the goals set in the introduction survey.
- Our research indicates that assigning at least the intro and two checkpoint surveys in order to see class grade improvement, self-reported self-efficacy, and academic engagement.

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