Goal Setting to Improve Students' Self-Regulated Learning, Studying, and Academic Achievement

by

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Abstract

Goal setting is widely researched in industrial/organizational psychology and in academic settings. Research involving post-secondary students has investigated optimal scheduling for goals and types of prompts for setting goals to improve academic achievement, increase productive habits related to self-regulated learning (SRL), increase course retention, and boost motivation for learning. Some research provides goal templates to guide goal setting, but students often have trouble following templates. Goal setting in past research has not always improved academic outcomes.

This project researched goal setting from a SRL perspective using a new template, ACE IT: Action, Content, Evaluation/Efficacy, Importance, and Timeframe. In a regular course, undergraduates in the Goal Setting condition were: trained about ACE IT, provided a library of study techniques to consider when creating learning goals, completed the guided ACE IT goal template, and reflected weekly on goal(s) set and attainment. Students in a Learning Diary (LD) condition kept a diary of learning activities, had access to the same Study Strategies Library, and reflected weekly on studying in general without guidance provided by the ACE IT goal template.

In Fall and in Spring term, students' academic achievement was measured by final grades. Self-reported SRL skills were assessed using a questionnaire. Mixed methods included qualitative coding of students' entries in ACE IT goal templates and unstructured Learning Diaries, and quantitative analyses of perceptions of: the ACE IT template, Learning Diary, and Study Strategy Library. Unlike prior research, students proficiently used the ACE IT template and reported positive attitudes about setting goals in both conditions. All students appreciated trying new study strategies, experienced more accountability in their studying, and perceived study plans were more organized. Groups in Fall term did not differ in final grades while the comparison (LD) group achieved higher marks in the Spring term sample.

Suggestions for practice include providing students a study skills library, promoting weekly planning for learning, inviting reflection on goals, and training to frame high-quality goals.

Keywords: Goal setting; Structured template; Goal prompts; Self-regulated learning; Academic achievement; Learning diary

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List of Acronyms

GS	Goal Setting (or Goal Setting Group)
LD	Learning Diary (or Learning Diary Group)
SFU	Simon Fraser University
SRL	Self-Regulated Learning
SSL	Study Strategy Library

Chapter 1. Introduction

Goal setting is a skill, and the ability to set goals and make plans about how to achieve them is essential for success (Locke & Latham, 2006). Goal setting has been investigated extensively in industrial/organizational psychology (Locke & Latham, 2006; Locke & Latham, 1990). Effects of goal setting in academic settings are less thoroughly researched. Among students aged 9 to 17 Garrels (2017) surveyed, 57% reported they rarely or were never taught how to make plans to guide them in achieving goals at school. These students will go on to post-secondary studies likely lacking this important skill, possibly limiting their academic success. Recently, emphasis has been given to investigating how to optimally integrate goal setting in an academic setting to help students improve their grades (Morisano, Hirsh, Peterson, Pihl, & Shore, 2010), increase their use of self-regulation strategies (Chang, Tseng, Liang, & Liao, 2013), avoid dropping out of post-secondary programs (Morisano & et al., 2010), improve their learning motivation (Chang, et al., 2013), learn how to set effective goals (McCardle, Webster, Haffey, & Hadwin, 2017), or enhance their interest in course content (Clark, Gill, Prowse, & Rush, 2017). While goal setting interventions have benefits in certain situations, such as with students on academic probation (Morisano et al., 2010), in other settings with wider ability ranges, goal setting interventions have had no detectable effect compared to control conditions (Dobronyi, Oreopoulos, & Petronijevic, 2017).

1.1. Research Significance

Because previous research reports conflicting results for goal setting interventions, my research aims to refine and explain potential benefits of goal setting for undergraduate students. Goal setting was studied from a self-regulated learning perspective. Students in an undergraduate course experienced a goal setting intervention that included: training, a library of study techniques to consider when creating learning goals, filling out a goal template (structured form) describing specific features of goals, reflecting weekly on the goal(s) set and their attainment, and a final questionnaire about the experience. A comparison group of students kept a diary of their learning activities

and had access to the same library of study techniques but were neither supported to set and monitor goals nor provided structured goal templates. Motivational scaffolding using goal setting templates can promote academic achievement, motivation, and self-efficacy (Dweck, Walton, & Cohen, 2014). Gathering information about how students fill out the goal template, and their responses to weekly reflections will inform goal setting research and guide designs for future goal setting interventions to improve academic achievement.

It is important to study goal setting in academic settings as most research focused on goal setting in work-related organizations. Using a mixed method approach to goal setting research allows observing not only potential associations between goal setting and academic performance, but also affords an in-depth analysis of how students actually fill in and use a structured goal template and unstructured planning template. These data can inform future goal setting research. Generally in academe, little support is given to students who may set goals in authentic academic learning situations (Kismihok et al., 2020). Widespread adoption of goal setting in higher education can happen with support from technology and an easily adaptable goal setting template that instructors can customize if needed and share with students through an online link. Students can set goals from anywhere and, through regular practice, may become better self-regulated learners in the process.

1.2. Thesis Structure

Chapter 2 outlines the two theoretical approaches used in this research: self-regulated learning (SRL) and goal setting theory. SRL is presented as a four-phase model with goal setting highlighted as a major element in the process. Research on goal setting in higher education is presented, along with literature on different types of goals (self-set vs. assigned goals; the role of self-efficacy in goal setting; learning vs. performance goals; how students evaluate their own goals; goal setting online) and what content is important to include in goal setting interventions. Chapter 2 ends with the study purpose and seven research questions posed for this study. Chapter 3 describes in detail the study materials and procedure. Results are presented in Chapter 4 followed by a discussion in Chapter 5.

Chapter 2. Review of the Literature

2.1. Theoretical Background

2.1.1. Self-Regulated Learning

A student who misses assignment deadlines, doesn't clearly understand requirements for assignments, and uses different strategies with no clear objective is a student who is poorly regulating learning. On the other hand, a student who plans studying sessions, sets goals about how to study and what to learn, carefully decides which tactics and strategies to use in learning, and checks their understanding and its match to goals after a study session is in a position to productively regulate learning.

Self-regulated learning (SRL) is a recursive process of cognitive engagement by which students plan, adapt and evaluate their learning behaviour (Butler & Winne, 1995; Winne, 2021). SRL can improve students' academic outcomes and perceptions of self-efficacy (Dignath & Büttner, 2008; Zimmerman, 1990). From an information processing perspective, one prominent model of SRL includes four phases, each with potential for adaptivity: defining a task, setting goals and forging a plan to achieve those goals, using study strategies, and making adaptations based on whether standards are met (Butler & Winne, 1995; Winne, 2018; Winne & Hadwin, 1998). When studying, self-regulated learners are metacognitively, motivationally and behaviourally active (Winne & Azevedo, 2014; Zimmerman, 1986). Metacognitive awareness is cognizance of one's thinking, knowledge, and strategy use (Ridley, Schutz, Glanz, & Weinstein, 1992). Students' metacognitive processes include planning, setting goals, and evaluating progress (Zimmerman, 1990). Motivationally, students who productively regulate learning have positive self-efficacy about their ability to achieve their learning goals (Winne & Hadwin, 2008). Behaviourally, students are enacting study strategies to carry out their goal-directed tasks.

A key phase of SRL – setting clear, specific and challenging goals – results in higher performance on learning tasks than setting easy goals or no goals at all (Locke,

Shaw, Saari, & Latham, 1981). Setting specific goals is beneficial because it helps to direct students' attention and effort, heighten persistence, and leads to developing plans or identifying strategies that can be used to achieve the goal (Locke et al., 1981). Productively self-regulating learners exhibit greater interest in tasks and report higher self-efficacy (Zimmerman, 1990), the student's belief about having ability to carry out a certain task (Pajares, 1996). The more positive a student's self-efficacy about a task, the more effort they are likely to put into it and the longer they persevere at it (Pajares, 1996). Also, self-regulated learners are behaviourally active in that they structure an environment to better suit their learning, seek information as needed, and change strategy if it is judged ineffective in reaching their learning goals (Zimmerman, 1990). Instructors should allow students to practice their self-regulated learning and learning strategies, rather than continuously directing students to use a specific strategy in only one type of learning activity (Paris & Paris, 2001). Because goals are the launch point for the course of learning (Maclellan & Soden, 2006), there can be no self-regulated learning without goal direction (Winne, 1997). Additionally, self-regulated learners should be allowed to choose their own strategies to implement in a studying session, based on their perceptions of the task, and on their past studying behaviours (Winne, 2013). Then, as students work on a task or approach a deadline, they can assess their strategy use and goal achievement, and use this information to make any necessary adjustments in their approach (Winne, 2013).

Providing students opportunity to set goals and choose strategies before a studying session is thus theorized to be one key to developing and using productive SRL skills. Students bring to the task their prior knowledge, perceptions about attributes of the task, knowledge of how they have studied in the past and about themselves (Winne, 2013). Adaptation after metacognitively monitoring progress and evaluating products against standards is integral to self-regulating learning (Winne & Hadwin, 2008). Thus, allowing time for reflection, e.g., each week after attempting to achieve short-term goals, is theorized to help students monitor their progress, and adapt their studying goals for the next week.

2.1.2. Goal Setting Theory

A goal entails the intent to act. The result of action, and possibly the actions themselves, are described in terms of a standard of achievement or proficiency, often within a certain time period (Locke & Latham, 2002). Goal setting theory is one of the dominant perspectives in student motivation (Lazowski & Hulleman, 2016). Goals that are specific and challenging but not so difficult as to be unachievable encourage students to have higher commitment and greater value for that goal than do vague goals the student believes are easy to attain (Locke & Latham, 1991). A person told to "do their best" does not have a specific, clearly defined goal in mind, and their performance can vary from poor to mediocre to good. One operative factor in this relationship is reducing ambiguity about the result desired (Locke & Latham, 2002). Specificity of goals also helps individuals to look for and use relevant knowledge or strategies that can help direct their actions to better achieve the goal (Locke & Latham, 2002). The other operative factor is that difficult goals elicit more effort, up to the maximum of a person's ability, as well as greater persistence to the maximum level of a person's commitment to the goal (Alessandri et al., 2020; Locke & Latham, 2002). In turn, commitment is a joint function of importance to the individual of the goal and its outcomes, and self-efficacy (Locke & Latham, 2002).

According to Morisano and Locke (2013), goals influence academic achievement because, when students set goals, they have a better sense of their direction and can direct their actions towards achieving their goals and towards goal-related activities. When students create goals that are meaningful to them and that they believe are attainable, they are more committed to them and more persistent. When goals are challenging (but not overly challenging) to achieve, students will put in more effort to reach them. Once students experience goal attainment, self-efficacy increases, and motivation increases to create further goals, which then can lead to further increases in academic achievement.

2.2. Goal Setting in Post-Secondary

There is scant research on the causal effects of goal setting for undergraduate students' academic achievement (Clark, Gill, Prowse, & Rush, 2017) and only a few randomized controlled experiments investigated authentic goal setting in an academic setting (Acee et al., 2012; Morisano & Locke, 2013). In one of the few studies, Morisano, Hirsh, Peterson, Pihl and Shore (2010) compared two groups of undergraduates who had relatively low GPA (below 3.0/B). One group participated in a one-time goal setting intervention lasting 2 hours; the other group participated in an equally cognitively demanding intervention not addressing goals. In the following academic term, the researchers found GPA was higher among the goal setting group. Based on analysis of a follow-up questionnaire about the intervention, given to students 4 months later, increased GPA correlated with a decrease in negative affect. That is, students who reported feeling less anxious, stressed, sad, or more satisfied and more concentrated 4 months later had improved GPA. The goal group had greater reduction of negative affect than the control group. When affect was statistically controlled for, the prediction of increased GPA in the goal group disappeared. It is unclear whether the reduced negative affect led to improved GPA, or whether improved GPA led to the reported reduced negative affect in the goal group. Within the goal setting group, several goal-related factors were explored to see which predicted improved academic performance: creating academic vs. non-academic goals, the number of specific behavioural plans, obstacles, benchmarks outlined by the student for each goal, and the number of words used to describe the goal and how it would affect the student's life. Among this set, one statistically detectably predicted academic performance: the number of words students used to describe their ideal future. Students who wrote more had greater improvement in GPA (Morisano et al., 2010). Morisano et al.'s (2010) one-time intensive goal setting intervention correlated with reduced negative affect and improvements in GPA. The researchers acknowledge further research should focus on how and why student goal setting impacts these factors (Morisano et al., 2010).

In contrast to this study, Dobronyi, Oreopoulos, and Petronijevic (2017) offered a similar goal setting program administered online to over 1000 undergraduate students. In

this study, compared to a control group, goal setting did not affect GPA or course retention, even when participants were offered the chance to receive follow-up reminders of their goals (Dobronyi, Oreopoulos, & Petronijevic, 2017). Whereas Morisano et al. (2010) had focused on students with relatively low GPA, Dobronyi et al. (2017) had participants with a range of GPAs in the goal setting condition.

McCardle, Webster, Haffey, and Hadwin (2017) looked at students' self-set short-term, task-specific goals, for a series of single study sessions spanning a semester. They found that without scaffolding, students set poor quality goals that lacked actions, standards, and learning content. Most goals were about completing behavioural tasks, such as "get homework and readings done" or "get started." When these researchers taught students about SMART goal setting (including Specific, Measurable, Attainable, Relevant, and Timely criteria in their goals), they observed erratic or no improvements in goal quality over a semester (McCardle et al., 2017). They inferred goal setting must be scaffolded, and merely asking students to state a learning goal for a study session did not counteract setting poor quality goals.

Webster, Miller, and Hadwin (2012) compared a group of students who received an open-ended instruction to set goals to a group who received a goal setting template with specific goal slots. The open-ended group received an instruction to set a goal that contains information about time, action, standards, and content (TASC). The second group received the same information presented as a paragraph with blanks the student had to complete. For example, they had to choose from the following options "My goal is to _____ [define/explain/analyze}" and type in specifically what content they would work on, the day/time they would work on it, their standards for achieving their goal (TASC components). The researchers found no difference in goal quality between the two groups, however for both groups, goal quality did improve over time. Higher goal quality was also correlated to higher term GPA (Webster, Miller, & Hadwin, 2012).

2.3. Meaningful Goals and the Role of Self-efficacy

The goals on which students base their actions and performance should be meaningful to them (Chase et al., 2013). Undergraduate students who had SMART goal setting training along with values training had higher end of term GPA than students who received only SMART goal setting training (Chase et al., 2013). The values training included instructions about the definition of personal values (e.g., "Personal values can be defined as areas of your life that have meaning to you … think of a time when you felt that you were living your life with meaning or purpose"), and asked students to reflect on and write about their own personally important academic values (Chase et al., 2013). This may support the idea that goals students set for themselves which have personal value to them may result in higher achievement than goals or objectives given to them by an instructor.

Latham and Locke (1991) developed a goal-efficacy model which considers four factors important in influencing students' academic performance: ability, self-efficacy, self-set goals, and assigned goals. Klomegah (2007) investigated these four factors and high-school GPA to probe relations to students' course grades in undergraduate studies. High school GPA, self-efficacy, and self-set goals were statistically detectable predictors of academic performance, but the other variables were not (Klomegah, 2007). Self-efficacy was the strongest predictor of the four factors of the goal-efficacy model (Klomegah, 2007).

The goal setting research cited in this thesis focuses on goals students set for themselves. When comparing the efficacy of assigned goals vs. self-set goals, findings indicate self-set goals are more beneficial (Schunk, 1985). Especially when students are low in achievement motivation, self-set goals enhance their performance when compared to assigned goals (Hom & Murphy, 1985).

The present study focuses on students setting goals for themselves so findings can be compared to similar research which also focus on students' self-set goals. Perhaps when students create their own academic goals, those goals are more meaningful to the student and may result in greater goal-commitment or self-efficacy.

2.4. Learning vs. Performance Goals

Clark, Gill, Prowse, and Rush (2017) found students who set performance goals (e.g., seeking a score or letter grade) did not see any effect on their exam performance compared to a control condition that did not set goals. However, students who set task-based goals about completing online practice exams had higher exam performance compared to a control condition that did not set goals. This was because they completed more online practice exams than students who set no goal or set performance goals. In other words, task-based goals to complete practice exams led to improved exam performance. In a different domain, Zimmerman and Kitsantas (1997) compared process goals and outcome goals for students setting goals to learn a complex motor skill. They found students who set process goals outperformed students who set outcome goals in both skill and self-efficacy (Zimmerman & Kitsantas, 1997). Harackiewicz, Barron, Carter, Lehto, and Elliot (1997) found performance goals helped increase college students' academic grades but didn't affect interest. In contrast, mastery goals increased interest in course content but didn't affect grades. Students who set performance goals compared to mastery goals may perform at a similar achievement level, however they show more psychological and emotional vulnerabilities, such as anxiety and boredom (Daniels, Haynes, Stupnisky, Perry, Newall & Pekrun, 2008).

2.5. Self-evaluation of Goals

When students set study goals, they must decide whether they have achieved their goal based on self-evaluations – particularly in university courses where most external feedback is restricted to two or three exams throughout a term. Students can set outcome-based goals for these external evaluations, such as seeking a certain letter grade or percentage on the exam. However, for most goals about studying activities students may set throughout the term, they tend to set process goals, such as "study this psychology chapter" or "be able to explain this theory in my own words" (Hadwin & Webster, 2013). It is important for students to be able to assess whether they have achieved their goal based on self-set standards because this affects how they adjust their goal-directed actions, and how they set subsequent goals for future studying (Hadwin & Webster,

2013). In the current study, students were asked at the end of each week to self-evaluate their goal progress and indicate what factors may have contributed to them either achieving or failing to achieve their goal for that week.

2.6. Presenting Goal Setting to Students Online

Compared to other interventions an institution can provide for students, goal setting is low-cost and scalable (Clark et al., 2017), especially via online delivery. Using online software to set goals is easier than setting goals on paper during class; goals can be accessed from anywhere using an internet connection and students are not restricted to setting and monitoring their goals at a specific time (Riedinger, 2004). They can log on at their convenience to check their goal progress. Online software also can keep records more organized, and it would be possible to give instructors access to the online goals, so they can assess whether students are setting productive goals. In addition, online goal setting can make it more convenient to share goals, for example, if students seek peer feedback (Riedinger, 2004). Using online software to set goals can be more motivating than using paper-based goal setting strategies (Chang et al., 2013).

Chang, Tseng, Liang, and Liao (2013) compared attitudes of two groups of high school students, one group using an online goal setting tool for learning and the other using a paper-based portfolio to set goals. Students using the online tool could set learning goals, due dates, steps predicted to achieve their goal, and self-assess how appropriate their goals were. Both groups made similar responses to a survey about using self-regulated learning strategies and motivation before the treatment. When they took the survey again after the intervention, students who used the online goal setting system reported higher scores in self-efficacy, learning motivation, and overall self-regulated learning strategy use than students who set goals using the paper portfolio.

It is important to find a non-invasive, efficient way for students to engage in goal setting on a regular basis (e.g., every week or semester) because effects due to such interventions tend to fade if they are not provided regularly (Wibrowski, Matthews, Kitsantas, 2017). Online goal setting is one such option that is efficient and accessible.

2.7. Goal Content

Acee et al. (2012) investigated goal setting from three theoretical perspectives (goal setting theory, expectancy-value theory, and self-determination theory) to see which goal properties would have an impact on students' academic performance. The researchers focused on more general academic and personal goals rather than task-specific goals set by students, and looked at the impact on overall semester GPA rather than course grade as an indicator of academic achievement. For each of their academic goals, students were asked to rate how much they valued the goal, their expectation of success, and whether the goal was pursued based on personal interests (autonomous motivation) or on external pressures such as avoiding bad grades, or societal pressure or expectations (controlled motivation). The academic goals were rated by four researchers for specificity, scored 0 to 3 based on three components: whether the goal was measurable, had a start date, and had an end date. Students' academic goals had a specificity average of 0.97 (SD=0.45). Findings for the academic goals indicated goal specificity predicted semester GPA; more specific goals were related to higher semester GPA. Controlled motivation was negatively related to semester GPA, so students who created academic goals motivated by external pressures or reward/punishment were perhaps less motivated to achieve a higher semester GPA. The other predictor variables, including value, expectation of success, and autonomous motivation, were not statistically detectable in predicting semester GPA. Exploratory analyses conducted by the researchers to investigate possible interaction effects of the mentioned goal properties on semester GPA did not reveal any detectably statistical results.

McCardle et al. (2017) proposed self-set goals should contain specifics about four essential elements: timeframe, actions, standards, and content (TASC). They prompted students, "State one goal you have for your studying/learning in the upcoming week" (p. 5). When analyzing students' self-set goals, the researchers did not count goals about completing a task as being an action or standard since it did not indicate any cognitive engagement or provide a standard to judge learning (e.g., "get readings done"). Similarly, to receive a score for content, students had to include a concept rather than a task or chapter number. The researchers removed timeframe from their coding scheme as there

was not enough information in most students' goals to judge whether their indicated timeframe was realistic.

Overall, when students' self-set goals were analyzed for TASC elements, students rarely included any of them (McCardle et al., 2017). Only one goal out of 189 contained three of the coded-for TASC elements: content, action, and standards. In a second study, the researchers looked at students' weekly goals over 9 weeks while they were enrolled in a learning-to-learn course where they were taught about SMART (specific, measurable, action-oriented, realistic, and timely) goals. Students were asked "(a) Name one specific task (e.g. a reading, assignment, note taking, studying, etc.) to focus on this week, and (b) Set 1 good goal for the task you have chosen" (p. 11). Researchers hoped this instruction would lead to more specific goals, and students had a chance during the 9 weeks to learn about goal setting and practice setting goals with their lab instructor and classmates. Findings indicated students' goals were still mostly low quality and any improvements were minimal and inconsistent, especially considering students were explicitly taught about goal setting in their course. The researchers did not survey students after goal setting to gather their perceptions of the task but proposed three possible explanations for the lack of specificity in goal setting: low motivation (writing a goal was just another form for students to fill out); students might have held more specific goals internally, but not written them out fully; or, students have weak task understanding and did not really know how to learn or what they should be studying, and this was reflected in low-quality goal setting.

Beckman et al. (2021) qualitatively investigated students' goal setting and task interpretation in a naturalistic open-ended online setting. Students were interviewed before, during, and after a goal setting task and the quality of their task interpretations were assessed by considering the alignment between the teacher's description of the task and analysis of the task documents, and comparing these to the students' descriptions of the task. Quality of students' goals was assessed using TASC criteria, as in McCardle et al. (2017).

Beckman et al., (2021) found 29% of students interpreted the task at a high level of quality, 60% of students' task interpretation was moderate quality, and 11% had low quality task interpretation. Most of the task interpretation was based on explicit details from the assignment description, rather than implicit understanding or details.

Analyzing students' goals, the researchers found 22% of students created Weak or Basic goals with 0 or 1 TASC element, about 53% of students created Good goals with at least 2 TASC elements, and approximately 22% of students created Excellent goals with at least 3 TASC properties (Beckman et al., 2021). One student wrote an exemplar goal with all four TASC properties. Putting together the goal and task interpretation analysis, it seems those students who wrote Good or Excellent goals also had moderate or high quality task interpretation. Thus, the researchers concluded students who had a more developed task understanding were more likely to write specific goals with TASC elements (Beckman et al., 2021). As noted in McCardle et al. (2017), Beckman et al. (2021) found time-related goals were the least common in that the timeframe element was missing most often from students' self-set goals, perhaps indicating a lack of checkpoints at which students can evaluate their work against self-set standards. It is important to support students' SRL skills including goal setting in online open-ended learning assignments (Beckman et al., 2021).

Webster, Miller, and Hadwin (2012) used TASC criteria (time, action, standards, content) to compare a group of students who received an open-ended instruction to set goals to a group who received a goal setting template with specific goal slots. There was no difference in goal quality between the structured template and the open-ended goal group. For both groups, goal quality did improve over time. Higher goal quality was also correlated to higher term GPA (Webster, Miller, & Hadwin, 2012).

Morisano et al. (2010) conducted an exploratory analysis of the goals students created in their intervention mentioned in Section 2.2 of this thesis, and reported that the number of words students wrote to describe their ideal future was the only predictor of academic improvement. Students in the study wrote a mixture of personal and academic

goals, making it hard to determine which goals played a role in improving outcomes (Morisano et al., 2010).

Schippers et al. (2020) compared a goal setting group to a control group and found goal setting students had a 22% increase in academic performance compared to control group students. Noteworthy in this study was students did not necessarily have to create an academic goal. Rather, even participating fully in the intervention by creating personal life goals seemed to have a contagion effect for students and enhanced their academic achievement. This contrasts to goal setting theory which states goals should be specific and related to the desired outcome. This could be explained due to enhanced motivation students may feel after creating a detailed personal life goal for themselves. This active personalization can help with student engagement, especially for students with low confidence (Hulleman, Godes, Hendricks, & Harackiewicz, 2010). Predictors of academic success were the extent of participation by goal setting students, number of words written, and how specific students' plans were to achieve their goals (Schippers et al., 2020).

Researchers in this study explored whether students set academic or non-academic goals, the number of words students wrote to describe their goals, and the number and quality of students' plan to attain their goals (by coding their strategies and obstacles), and examined the relation of each of these variables to academic achievement (Schippers et al., 2020). Stage 1 of the intervention consisted of students writing about their values, passions, and ideal future in 6-8 goals (see Schippers, Scheepers, & Peterson, 2015). In Stage 2, students wrote a detailed plan about how they would overcome obstacles and what kinds of strategies they would use to achieve their big picture goals. The same online goal setting programme was used in this study as in Morisano et al. (2010), and students spent approximately 4 hours total writing about their goals and plans. In Stage 3, students had to make a goal commitment statement which would be presented on the university website, attached to their name and photograph (Schippers et al., 2020).

To score the quality of students' strategies and anticipated obstacles, two raters used a 4-point scale: 0 = blank, 1 = no strategies or obstacles named, 2 = strategies or obstacles listed but not explained, 3 = strategies or obstacles named and somewhat explained, and 4 = strategies or obstacles named with a measurable, detailed plan (Schippers et al., 2020). Looking the top three goals students set, 20% of the goals were academic. Students who participated in the goal setting intervention had greater academic performance than students in a control condition. Results indicated it didn't matter whether students set an academic life goal, or a non-academic life goal. What mattered for academic performance was how many words students wrote detailing their strategies and obstacles to attain their goal and the quality of their plan for using strategies and overcoming obstacles. Findings also showed students participating in both Stage 1 and 2 had higher academic performance than students who only participated in Stage 1 of the intervention. The researchers concluded that although goal setting theory calls for specificity in goals, perhaps big-picture goals are still beneficial if one makes a detailed plan for achieving them. Additionally, making detailed plans to improve a specific aspect of one's life or achieve an important goal can perhaps spread to other aspects of one's life such as academic performance (Schippers et al., 2020).

Stelnicki, Nordstokke, and Saklofske (2015) found the most important factors for undergraduate students to reach their goals included having a future orientation, persistence, and strong executive functioning skills.

Travers, Morisano, and Locke (2015) had 92 business-school students in a personal growth goal setting course participate in a five-stage goal setting intervention. In Stage 1, students were taught about goal setting theory, reflective diary keeping, and engaged in self-awareness activities. In Stage 2, students identified areas where they could set goals to personally grow. They chose three goals that would be most important to them. In Stage 3, students were asked to visualize the outcome they'd want to have after achieving their goals. They were asked to think of discrepancies between their current state and their desired state, and how they would measure having achieved their desired outcome. In Stage 4, students created strategies they could employ to achieve their three goals. Students were asked to create a final goal stating their goal behaviour,

desired outcome, the strategies they would use to achieve the growth goal, and how they would measure progress and personal growth. In Stage 5, students were instructed to work on reaching their goal whenever the chance arose, reflect on this in their diaries (ideally, daily), and make adjustments to their goal if necessary (Travers et al., 2015).

Uniform analysis of students' diaries was not possible due to variation in amounts and content written (Travers et al., 2015). Themes were identified by searching for key concepts and commonalities. Students were asked at the end of the course about the impact of the goal setting on their academics, what they believed were the most important aspects of the process, and whether creating growth goals transferred benefits beyond this course or their academics. In analyzing the academic goals students set, researchers found a combination of mastery goals and performance goals. Three main themes emerged in the goals: personal organization and time management, psychological and emotional control (e.g., manage stress, improve focus), and interpersonal-skills development (e.g., develop better listening skills). Based on students' diaries and end of study reflections, the researchers identified several "active ingredients" that support academic growth: (a) creating subgoals and proximal milestones help to achieve the distal growth goal; (b) classic study techniques are helpful; and (c) writing in a diary allowed for self-awareness that encouraged development by realizing what hindered achievement in the past, and by increasing self-esteem and self-efficacy (Travers et al., 2015).

Although academic research has supported some hypotheses about goal setting, such as more specifically detailed goals are related to higher academic achievement, more information is needed about students' goal content and what helps them succeed in achieving these goals. Comparing students who set academic goals vs. those who set personal life goals, it is not clear which is most effective and which aspects of the various goal templates used are useful. When students are prompted to include specific goal content (e.g., TASC), they are inconsistent in their goal setting and may need more scaffolding through online prompts and pre-set goal templates. Additionally, most of the goal setting research outlined here uses a one-time, multiple-hour intervention with little to no follow-up and reflection.

2.8. Gap in Research

While most research in academic goal setting has identified it as a factor related to increased grades at the end of the term, it is unclear exactly how goal setting helps students improve their academic achievement. Is it a motivational push to spend more effort in studying? Does setting goals provide students with language they are missing to explain how they will proceed in a studying session? Do students need to carve out specified time before starting their study session to think about their desired outcome, predict potential obstacles and determine how they might overcome these challenges? When students fail to achieve a goal, is it because of time constraints, outside circumstances, failure to create a well-formed goal according to goal setting theories, or is it that the goal is unattainable for the student because they lack skill to carry out actions the goal requires?

Goal setting research must expand beyond interview questions to include behavioural measures to investigate these issues (Zimmerman, Bandura, & Martinez-Pons, 1992). A review of research did not locate any studies that had students use a comprehensive weekly goal template with reflection to investigate goal setting and explore the reasons why students might fail or succeed in achieving their goals.

Therefore, this study investigates how students take up goal setting using a guided template and whether they are able to fill out the prompted guides. A comparison group will complete a similarly cognitively demanding task of creating entries in a learning diary about their learning activities. Data was collected in two terms – in the first term, individual students were randomly assigned, and in the second term, entire tutorial classes were randomly assigned to one of the two groups (see Chapter 3 for details). This allows comparisons on course achievement between the Goal Setting group and the Learning Diary group. Questionnaires at the beginning and end of the study will help detect any changes in reported self-regulated learning behaviour due to the intervention. The goals students set in this research are for authentic study sessions. Achieving their self-set goals may help students succeed in their academic courses and may even impact their overall studying habits and motivation towards goal setting.

2.9. Research Purpose

My study investigates issues related to success or failure in achieving goals by collecting weekly reflections from students based on their self-set goals. I investigate possible reasons why students succeed or fail to reach their goals through participants' responses to weekly reflection questions about what students find beneficial about goal setting, what aspects they find challenging, and what are possible reasons to account for goal attainment. This research will inform future interventions intending to remedy issues in goal setting that may help increase the probability of goal achievement.

A second aim of my study is to examine students' uptake and use of a structured goal template designed to help them create an effective goal.

A third aim is to explore how participation in a goal setting condition relates to academic achievement. Students' responses and achievement in a goal setting condition will be compared to a group of students who can consult the same study strategy library but do not access goal setting training or template.

A fourth aim is to explore whether students self-reported SRL skills change as a result of participating in the goal setting intervention, compared to a non-goal setting group.

This study will inform decisions about goal prompts that best enhance students' goal attainment, self-regulated learning, and course achievement. Results could direct future research in goal setting regarding issues students reveal they have with setting goals and attaining them. As well, data gathered from this study may reveal distinctions not considered previously or not in alignment with current literature, such as the necessity or unimportance of certain elements in the guided goal template. A further contribution of this study is informing instructional design by providing information on how to improve the presentation of goal templates, as determined by student feedback and their use of the guided goal template provided.

2.10. Research Questions

1. What are students' attitudes towards planning their studying for the week ahead (via a guided goal template or an unguided learning diary)?

2. How do students fill out and use a structured goal setting template?

3. What affects students' successes and failures at goal attainment when using a goal template?

4. How do students use and perceive a library of study strategies when creating weekly study plans?

5. When students have access to a library of study strategies, is there a difference in academic achievement between those who create structured goals and those who keep a learning diary?

6. After a four-week intervention, is there a difference in students' reports about self-regulated learning (SRL) skills between the Goal Setting group and the Learning Diary group? Does group participation affect change in reported SRL skills from initial ratings?

7. How many elements of a structured goal template do students include in an unguided learning diary? That is, can students create a detailed goal without prompting?

Chapter 3. Method

3.1. Participants

In Fall 2019, participants were 25 undergraduate students, 20 females and 5 males. Ages ranged from 18 to 25 years (M = 21, SD = 1.6) and one participant aged 44. Participants were enrolled in various disciplinary majors and an introductory Education course: Educational Psychology (EDUC 220) or Introduction to Research Methods in Educational Psychology (EDUC 222) at Simon Fraser University at the time of data collection. There were four people who were registered in both courses, however at the time of recruitment they indicated one EDUC course they would focus on for this study. In the total fall sample of 25, 36% of participants were non-native English speakers and 64% were native English speakers. In Fall 2019, participants were recruited via a flyer shown to students in EDUC 220 and EDUC 222 by their instructors. Three participants were from EDUC 220, and the remaining 20 participants were from EDUC 222. EDUC 222 students received course credit for participation in this research. Informed consent was received from all participants. All participants in both courses were entered in a draw for a chance to win one of five $50 awards.

In Spring 2020, participants were 52 undergraduate students, 33 females and 19 males, enrolled in EDUC 220. Ages ranged from 18 to 29 years (M = 20, SD = 2.2). In the total spring sample of 52, 27% of participants were non-native English speakers and 73% were native English speakers. EDUC 220 students received course credit for participation in this research (and had the same instructor as EDUC 222 students in Fall 2019). Students had the option to opt-out of their data being using in this research – no one opted out.

3.2. Research Design

This study has one independent variable at two levels: Goal Setting (GS) and Learning Diary (LD). The main difference between the two groups was the structure and content of the weekly template they filled out to plan their studying.

Data were collected over two terms, Fall 2019 and Spring 2020. The reason data collection is delineated by time is there were unforeseen circumstances in Spring 2020 – a global pandemic and switch to remote learning – that may have impacted students' goal setting and overall grades in Spring 2020. Spring 2020 students could choose to use a pass/fail system rather than receiving a letter grade. For Research Question 5, which deals with academic grades, data from Fall and Spring were analyzed separately.

In Fall 2019, each participant in the class was randomly assigned to either the GS or the LD group. In Spring 2020, entire tutorial groups formed by an unknown method applied by the Registrar's office were randomly assigned to either the GS or LD group.

3.2.1. Goal Setting Group

Students in the Goal Setting (GS) group used the **ACE IT** goal template each week, to create a study goal for their Education course. This structured goal template, developed for this study, is described in section 3.4 Materials. It identified content areas for **Action**, **Content**, **Evaluation/Efficacy**, **Importance**, and **Timeframe**.

Students used a provided Study Strategy Library, described in section 3.4 Materials, to choose a study strategy as their **Action** for that week. They then filled out the remainder of the goal template and summarized their complete goal. Students were told to work on the goal throughout the week. In the next week, before creating a new goal, students completed a goal reflection by responding to seven questions about their goal achievement in the past week and what helped or hindered them in accomplishing their goal. They then created a new goal for the upcoming week.

3.2.2. Learning Diary Group

Students in the Learning Diary (LD) group created a plan for their studying each week with little prompting as described in section 3.4 Materials. Students used the provided Study Strategy Library to choose a study strategy they would use that week, and indicated the Education course in which they would use it. Students were instructed to write notes about their studying for the week ahead. While they did receive an example of

types of information students might include when planning their studying, they did not receive a structured goal template. Students were to study and use the strategy they wrote about in their learning diary throughout the week. The next week, before creating their new learning plan, students responded to an open-ended reflection asking how well they studied using their study strategy and the plan from the past week. They then chose a new study strategy and wrote about their studying plan for the upcoming week.

The reason the Learning Diary group participated in study planning for the week ahead using the Study Strategy Library was to create as similar a situation as possible to the Goal Setting group except for the specific goal setting template. Students were asked to plan their studying rather than asked to complete an unrelated writing task each week to equate engagement. Also, asking students to write their study plan via an unguided note template allows for content analysis of their plans, to determine where they included important goal setting features without the guidance of a structured goal template.

3.3. Rationale for a Mixed Methods Research Design

Combining qualitative and quantitative data increases the scope and type of information that can be gathered in research (Morse, 2012). In this study, quantitative data gathered includes students' academic grades and their scores on pre/post questionnaires. Qualitative data is added to the study by analyzing student text in the structured goal template and unstructured learning diary. A mix of qualitative and quantitative data are collected via end-of-study student surveys on their perceptions of the Goal Setting task/Learning Diary task.

Responses to semi-structured survey questions gathered as qualitative data from participants fits well with quantitative data in mixed-method design (Morse, 2012). Data can be analyzed qualitatively, by conducting content analysis of the items, and/or quantitatively, by transforming features of the text to numerical data (Morse, 2012).

Research Question 2 in this study "How do students fill out and use a structured goal setting template?" and Research Question 7 "How many elements of a structured goal template do students include in an unguided learning diary?" are answered using

qualitative data, specifically, text students wrote when creating their goal or plan for the week. As outlined in Chapter 2, it is important to investigate whether students provide important goal elements when simply instructed (minimal guidance) to create a goal, or whether this needs to be prompted via a guided template. Analyzing students' written plans and goals can help answer this question. Chapter 4 details the data analysis process for each research question.

3.4. Materials

3.4.1. Study Strategy Library

Study skills can be seen as essential for learning; they make student learning more efficient and effective through the use of specific cognitive skills and processes (Gettinger & Seibert, 2002). Selecting and using study strategies aligns with phases of the self-regulated learning process (Butler & Winne, 1995). According to Fisher and Frey (2017), study skills are being discussed and investigated less frequently now than in previous decades. It is important to introduce and encourage the use of study skills so students can effectively use them and improve their academic outcomes.

A Study Strategy Library comprised of 11 study strategies was provided to all participants in this study. The study strategies selected are some of the most common mentioned in introductory educational psychology textbooks and in university student learning resource centres. They are also relevant for the course in which students would set goals. Each study strategy was presented in the same format: the name of the study technique, an introduction ("What is it"), a research-backed explanation of "Why it works," and a description of "How to use it." The 11 study strategies were grouped into four categories and are listed below. A full version of the Study Strategy Library as students saw it presented online is shown in Appendix **A**.

Study Strategy Library Categories and *Study Techniques*:

Reading Comprehension/Note-Taking

1. *Creating Compact Notes*
2. *Highlighting/Underlining*
3. *Self-questioning*

Review and Exam Prep

4. *Creating Practice Questions (Retrieval Practice, Self-testing)*
5. *Creating and Using Flash Cards (Rehearsal, Retrieval Practice, Self-testing)*
6. *Spaced Practice*

Elaboration/Organization of Information

7. *Synthesizing Information*
8. *Self-explanation*
9. *Summarization*

Note-taking in Lectures and Getting Help

10. *Effective Note-taking in Lectures*
11. *Visiting Professor or TA Office Hours*

The Study Strategy Library (SSL) was available online to both the Learning Diary group and Goal Setting group because the purpose of the research is to compare students who use a structured goal template with students who are not provided with the structured template. If only the Goal Setting group used the Study Strategy Library, it would be a confound considering those who completed a learning diary would be missing this element. Thus, all students were provided with the Study Strategy Library so they could benefit from using recommended study techniques in their studying.

Another reason students were asked to choose a study strategy only from the list of 11 presented in the Study Strategy Library was because students in the Goal Setting condition were asked if they achieved their goals each week. Keeping the study techniques students could use to a limited list of 11 helped to reduce variance in performance that could arise if students were using a multitude of different studying

strategies, or using similar techniques but giving them different names, while attempting to achieve their weekly goals.

Finally, it would be interesting if both groups, GS and LD, performed similarly in academic outcomes, and reported in the end-of-study surveys that they enjoyed using the study strategy library more than planning their studying and reflecting on their studying behaviour at the end of each week. In such a situation, it may be that simply providing students with a resource of study techniques and how to use them is most beneficial to their studying attitudes and habits.

3.4.2. Goal Template with Empirical Support

A goal template was created for students in the Goal Setting group to complete at the beginning of each week to set their weekly goal. A template was provided rather than allowing participants to free-write their goal because students rarely include important goal elements without guidance (Webster et al., 2012) and the use of goal prompts is beneficial in goal setting research (e.g., Morisano et al., 2010). The purpose of this structured goal template was to include elements that have been shown to be effective in past research. The goal template was presented in Limesurvey software with blank boxes for students to type in each section when creating their goal. For each section, an example was given to students for how to fill in the goal item.

The **ACE IT** goal template (Appendix C) created for this research contains five sections: **A**ction, **C**ontent, **E**valuation/Efficacy, **I**mportance, and **T**imeframe. Students were given training and instructions on how to fill out the template. See Appendix B for a copy of the Goal Setting Training students received the first time they created a goal with the ACE IT goal template. Appendix C contains the goal template as students used it in subsequent weeks to create their weekly goal. Table 3.1 lists elements of the structured ACE IT goal template.
For each element, the table shows the instructions provided to students and the evidence-based rationale (not provided to students) for including this item in the goal template.

Students were instructed “Use this ACE IT goal template to complete your goal each week. Make sure to complete all text fields.”

Table 3.1. ACE IT goal template and empirical supports

Element	Instructions provided to students	Empirical Support for this template element
A (ACTION)	Go to the study strategy library and choose from one of the study strategies listed. The study technique I will use this week is: _____	Almost all the research in goal setting asks students to indicate a specific action they will take when creating their goal. Goals impact performance because they direct students toward specific goal-relevant actions rather than actions that may not result in goal achievement (Locke & Latham, 2002) Thus, it is important to indicate a specific action in goal setting. Students could choose one of eleven study strategies presented in the SSL as their goal action. Choosing an action helps students create task-based process goals rather than performance goals. Research indicates task-based process goals are better for academic achievement (Clark et al., 2017).
C (CONTENT)	Indicate the course and the specific topic you will create a goal for (e.g., DNA replication; ADHD; The Big Bang Theory, etc.). My goal for this week is for the course: _____ The topic I want to focus on is: _____	Setting specific, clearly defined goals leads to higher performance than telling people to do their best (Locke & Latham, 2002). Choosing specific content to study for that week allows students to focus their studying and makes it more likely they will be successful in achieving their goal.
E (EVALUATION/ EFFICACY)	**This element consists of several questions related to how students will evaluate their achieved goal, what obstacles they might face and how to overcome them, and asks students about their confidence in achieving the goal they create.**	
	How will you know when you have achieved this goal? What is your desired outcome? I will know I have achieved this goal when I am able to: _____	When a goal is specific about content and standards, the desired result becomes clear and unambiguous to students, and leads to higher performance (Locke & Latham, 2020).
	Write out any obstacles you might face when trying to achieve the goal for this week: _____	Goal progress is aided by detailed implementation plans (Gollwitzer, 1999; Koestner, Lekes, Powers, & Chicoine, 2002; Locke et al., 1981) that describe the path to a goal, which can help in overcoming challenges (Gollwitzer &

Element	Instructions provided to students	Empirical Support for this template element
	How will you overcome your obstacle(s)? _____	Brandstatter, 1997).
	How confident are you in your ability to achieve this goal in the coming week? Very confident 5…4…3…2…1 Not at all confident	Self-efficacy, or a student's belief in their own ability to accomplish a task, is an important factor that can greatly impact academic performance (Klomegah, 2007; Latham & Locke, 1991). Self-efficacy can also affect how committed someone will be to a goal (Locke & Latham, 2002).
I (Importance)	**In the Importance element, students are asked to indicate how the goal they create is related to either their educational or personal values. They are then asked about their ideal future, and how achieving this particular goal will benefit their future. Finally, students are asked to rate their commitment to the goal they just created.**	
	Indicate why this goal important to you. How is the goal related to your educational or personal values? _____	Research by Chase et al. (2013) found that undergraduate students who had goal setting training along with values training had higher end of term GPA than students who received only goal setting training. This may support the idea that goals students set for themselves, which have personal value to them, result in higher achievement than goals or objectives that may be set for students and have little value to them. In addition, how important a goal is to a person affects how committed they will be to achieve that goal (Locke & Latham, 2002). The following question was included in the template as part of the Importance element:
	What is your ideal future, and how will achieving this goal benefit your future? _____	It has been suggested that the very process of representing the future consequences of a goal might provide a cognitive source of motivation (Bandura, 1977; Schunk, 1991). Based on Morisano et al.'s (2010) finding that the number of words students used to describe their ideal future when setting goals predicted increased GPA, it is important to include in any goal setting template a section for students to outline their desired future based on a goal they set for themselves, to help them reflect and gain clarity about how their specific goal can contribute to their anticipated result.
	Rate your commitment to this goal:	Goal commitment is an important component of goal success (Koestner et al.,

Element	Instructions provided to students	Empirical Support for this template element
	100% committed…….0% committed	2002; Ryan, Sheldon, Kasser, & Deci, 1996). Goals lead to high performance when individuals are committed towards achieving their goals (Locke & Latham).
T (Timeframe)	This goal should be completed within a week. Indicate when and how often you will work on this goal in the coming seven days. Estimate how many hours completing this goal will take: _____ What day(s) and time(s) will you work on this goal? _____	Goals that have a shorter duration and short-term deadline are more effective goals for self-regulated learning (Webster, Miller, & Hadwin, 2012).
Summary of ACE IT goal		
	Use the following text box to summarize your overall, detailed, goal for this week: _____	Students are asked to summarize their overall goal, and this completes the goal template.

3.4.3. Learning Diary

The complete learning diary is presented in Appendix D with the full instructions that were provided to participants. The learning diary asks students to choose a Study Strategy from the SSL, indicate the course in which they will use it, and make general notes about their studying for the week ahead. As prefill text in a notes field, students were shown an example of the kind of information that might be included in a study plan, including timeframe, content, the study strategy chosen, and the final desired outcome. Students were given the following instructions when completing their learning diary:

> *Choose a study strategy to use for one of your courses this week. Click on this link study strategy library to identify one of the study strategies listed there.*
>
> *Study Strategy I chose this week:*
>
> _____
>
> *Course I will use it in:*
>
> _____
>
> *Notes about my studying for the week ahead:*

Write about your studying plan for the week ahead, including the study strategy you chose. As an example, a student might include the following kind of information in study notes: time spent studying, days on which you will study, the study strategy you chose to use, the content you study, and what you want to be able to achieve after studying.

According to McCardle et al. (2017) and Webster et al. (2012), providing topics to describe about their goals, as this instruction does, appears to have no benefit in creating effective goals. Therefore, while this instruction would invite participants to record information of value to my research, I did not expect it would influence effects I investigated.

3.4.4. Weekly Reflection

One week after completing their structured goal or learning diary, students were asked to complete a reflection before continuing on to set a new goal/plan for the week ahead.

Students in the Goal Setting group were reminded of the goal they had set the previous week when they were sent the links to complete their goal reflection and new goal for the week ahead. Students then responded to seven reflection questions. The Weekly Goal Reflection questions are listed below. The questions aim to determine first whether students were achieving their weekly goals. Depending on their response to the first question (Yes, Somewhat, Undecided, or No), students were asked what might have helped or hindered them in goal achievement. The purpose of these questions was to address research question 4, "What affects students' successes and failures at goal attainment when using a goal template?" Students are given some suggested reasons why they may have been able to achieve or why they may not have been able to achieve their goal from the past week. Following this are some questions asking whether goal setting affected students' motivation or confidence when studying. Finally, students are asked two open-ended questions asking if there is anything else they want to share about their goal setting and achievement. (See also in Appendix F).

Table 3.2. Weekly Goal Reflection

<table>
<tr><td>Q1</td><td colspan="4">Did you achieve your goal from last week?

Yes – I achieved my goal for the week.
Somewhat – I was partly successful in achieving my goal for the week.
Undecided – I am not sure if I achieved my goal for the week.
No – I did not achieve my goal for the week</td></tr>
<tr><td></td><td>If Yes</td><td>If Somewhat</td><td>If Undecided</td><td>If No</td></tr>
<tr><td></td><td>What <u>helped</u> you achieve your goal for the week?
(Check all factors that had a major effect on your goal):</td><td>Respond to the questions below:</td><td>Respond to the questions below:</td><td>What made it <u>harder</u> for you to achieve your goal for the week?
(Check all factors that had a major effect on your goal):</td></tr>
<tr><td></td><td>☐ The course content in my goal was easy for me to study/learn
☐ The study strategy I chose was easy to use and effective
☐ I had enough time this week to work on my goal
☐ I had other obligations outside of academics, but this goal was higher priority for me
☐ I was very committed to the goal I set for the past week
☐ Other: _____</td><td>a) The course content I was working on this week in my goal was easy to study/learn:
1 Strongly Agree…..Strongly Disagree 5

b) The study strategy I chose this week was easy to use:
1 Strongly Agree…. Strongly Disagree 5

c) I had enough time this week to work on my goal
1 Strongly Agree…. Strongly Disagree 5

d) I was very committed to the goal I set for the past week
1 Strongly Agree…. Strongly Disagree 5</td><td>a) The course content I was working on this week in my goal was easy to study/learn:
1 Strongly Agree…..Strongly Disagree 5

b) The study strategy I chose this week was easy to use:
1 Strongly Agree…. Strongly Disagree 5

c) I had enough time this week to work on my goal
1 Strongly Agree…. Strongly Disagree 5

d) I was very committed to the goal I set for the past week
1 Strongly Agree…. Strongly Disagree 5</td><td>☐ The course content in my goal was difficult for me to study/learn
☐ The study strategy I chose was difficult to use or didn’t work for me
☐ I ran out of time to work on this goal
☐ I had other obligations outside of academics and this goal was lower priority for me
☐ I was not very committed to the goal I set for the past week
☐ Other: _____</td></tr>
<tr><td>Q2</td><td colspan="4">Setting a goal and making a plan for my learning using the ACE IT goal template motivated me to put more effort towards my goal:
1 Strongly Agree……. Strongly Disagree 5</td></tr>
</table>

Q3	Setting a goal and making a plan for my learning motivated me to put more effort towards *all my studying*, not just the content noted in my goal. 1 Strongly Agree……. Strongly Disagree 5
Q4	After this week, I am more confident I can set and achieve my goals 1 Strongly Agree……. Strongly Disagree 5
Q5	Are there any factors that could have made it easier for you to achieve your goal this week? [text box]
Q6	Any other comments about the goal you set and your achievement in the past week? [text box]

Students in the Learning Diary group were reminded of the learning plan they had set the previous week when they were sent the links to complete their reflection and new learning diary for the week ahead. Students were asked to reflect "If a friend asked you about using the strategy and how well it worked for you, what would you say?" (See Appendix G for Weekly Learning Diary Reflection).

3.5. Measures

3.5.1. Demographic Questionnaire

A demographic questionnaire (Appendix H) asked participants to identify their sex, major, and age. They also were asked to indicate the number of years of schooling they had in English, and whether English is their first language. Students were asked what year they were in, number of credit hours completed, current GPA, and how many hours they work or volunteer outside of academics.

3.5.2. Self-Regulated Learning (SRL) Questionnaire

Because the goal setting in this research was situated in a SRL theoretical framework, select subscales were chosen from the Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich, Smith, Garcia, & McKeachie, 1991). The subscales relevant to this study were *Rehearsal*, *Elaboration*, *Organization, Critical Thinking*, and *Metacognitive Self-Regulation* from the *Cognitive and Metacognitive Strategies* component and *Time and Study Environment* and *Effort Regulation* from the *Resource Management Strategies*. The subscales chosen are related to SRL and to the study strategies presented to students in the Study Strategy Library when creating their learning plan or goal. Students were told to think of their Education course (EDUC 220 or EDUC 222) when responding to the items in the questionnaire (see Appendix I). Students filled out this questionnaire twice – once at the beginning of the study before engaging in any goal or plan creation, and once at the end of the intervention.

The purpose of this SRL questionnaire was to investigate whether participants' self-reported SRL skills changed after engaging in a four-week goal setting/learning diary

intervention. Self-report instruments can measure students' general aptitudes and tendencies to use certain self-regulated learning skills (Pintrich, 2004).

3.5.3. Student Perceptions of the Goal Setting Task

After the Goal Setting intervention was complete, students completed a questionnaire (Appendix J) asking about their perceptions of the ACE IT goal setting template and Study Strategy Library, and how these might have affected their studying and goal setting skills. The purpose of this questionnaire was to gather qualitative and quantitative data about which aspects of the ACE IT structured goal template students found useful, and which were not so beneficial in their opinion.

3.5.4. Student Perceptions of the Learning Diary Task

After the learning diary intervention was complete, students completed a questionnaire (Appendix K) asking about their perceptions of the learning diary and Study Strategy Library, and how these might have affected their studying skills. Students were also asked "Were you aware of another condition in this study?" to determine whether some students might have had an idea of a more structured goal template.

3.5.5. Study Strategy Library Ratings

Before starting the GS and LD tasks, students were asked to examine each of the 11 study strategies in the Study Strategy Library, and for each one asked "How confident are you in your ability to use this study technique?" Students rated their confidence on a slider containing five options, from 'Very Confident' to 'Not at all confident.' At the end of the intervention, students again rated their confidence in using the 11 study strategies. The purpose of this rating before and after the intervention was to determine whether students' confidence in study strategies changed after using them weekly for four weeks when creating a learning diary or structured goal.

3.6. Procedure

3.6.1. Part 1: Consent and Training

In Fall 2019, participants were sent via email a consent form to sign before participation in the intervention. In Spring 2020, participants were sent a letter to opt-out of their data being used in this research after data collection was complete. No one opted out. All other procedures were the same.

All communication occurred online. There was no in-person contact during this research. Students were randomly assigned to either the Goal Setting group or Learning Diary group. The researcher sent participants all the pre-intervention materials via email (the Demographic Questionnaire, the SRL Questionnaire, and the Study Strategy Library Ratings). These items were the same for all and participants had one week to complete them.

Once students completed the pre-intervention measures, they were sent group-specific items and Week 1 of the intervention began. Materials were sent to participants on Saturday of each week, to be completed by Tuesday at 12:00 pm.

In Week 1, students were emailed instructions to access the goal setting template/learning diary presented online using LimeSurvey software. Students were given a unique code to enter in all study materials so I could match their response across questionnaires. GS participants saw the Goal Setting training first (Appendix B) and then filled out their Week 1 Goal template (Appendix C). LD participants saw learning diary training (Appendix E) and completed their Week 1 Learning Plan (Appendix D). Students were instructed to work on their goal/learning plan for the upcoming week.

Students had three days to complete these tasks. The deadline was Tuesday at 12:00 pm, and if they had not completed by Monday night they were sent a reminder email. If participants had still not completed their task by Tuesday 12:00 pm, they were sent a final reminder email to complete before Wednesday 12:00 pm, and work towards achieving the goal/plan that week.

3.6.2. Part 2: Planning and Reflecting

Week 2: On the following Saturday, participants in both groups were sent email to complete their Week 2 tasks. In the GS group, each participant was reminded of the goal they had sent the previous week (pasted in the email), and were sent a link to the reflection questions for Goal 1 (Appendix F) and ACE IT template (Appendix C) to create Goal 2.

In the LD group participants were also reminded of their previous learning plan via email, and were sent a link to complete their reflection (Appendix G) and Week 2 learning diary (Appendix D). Tasks were due by the next Tuesday at 12:00 pm, and reminder emails were sent to those who may have delayed in submitting their tasks.

Week 3: The procedure was the same as Week 2. On Saturday participants were reminded of their previous week's goal/plan, and sent links to reflect on how well those went. They then worked on a new goal/plan for Week 3, to be submitted by Tuesday so they could work on achieving it during the rest of the week.

Week 4: The procedure was the same as Week 3. On Saturday participants were reminded of their previous week's goal/plan, and sent links to reflect on how well those went. They then worked on a new goal/plan for Week 4, to be submitted by Tuesday so they could work on achieving it during the rest of the week.

Week 5: On Saturday of the fifth week, participants were sent an email reminder of their Week 4 goal/plan along with a link to write their Week 4 reflection. Their second task was to again complete confidence ratings for each strategy in the Study Strategy Library. Once these were submitted, participants were emailed their final tasks: complete the Student Perceptions of the Goal Setting/Learning Diary Task (depending on their group), and fill out the Self-Regulated Learning Skills questionnaire (called Learning Skills Questionnaire so as not to prime students to the content of the questionnaire).

Chapter 4. Results

A structured goal template was offered to students and weekly reflections were collected to factors influencing student goal achievement, and subsequent academic performance. A comparison group was asked to create personally designed learning plans, following up on past research investigating whether students are able to create quality goals without specific guidance. All students' self-regulated learning skills were assessed using a self-report survey before and after the interventions, and final grades were collected in the education course for which they were creating a goal. A study strategy library with detailed explanations of empirically based study tactics was provided to students in both groups, and their perceptions and use of this tool were gathered as well. Each of the seven research questions under investigation and their results follow. One set of data, students' final grades in Spring 2020, were collected after the COVID19 pandemic, and are analyzed in section 4.5. These final grades may have been impacted in unknown ways due to the pandemic.

For each statistical analysis, assumptions were examined and, if violations were observed, they are noted in that section.

4.1. Research Question 1: What are students' attitudes toward planning their studying?

A mixed methods approach was used to examine responses to the Student Perceptions of the Goal Setting Task Questionnaire or the Learning Diary Task Questionnaire across Fall 2019 and Spring 2020. Content analysis was used for the open-ended text responses. I identified themes/ideas in participant responses and assigned each theme a code. A theme was counted if it was present in a text response. If a person mentioned multiple themes, each theme was counted once. There were no occasions in which a person repeated a theme in their response.

Two co-raters, myself and a colleague with a PhD in Educational Psychology, coded each text response independently. The very few discrepancies were discussed, and a final agreement was reached for codes applied to each response.

4.1.1. Goal Setting Group

Listed below are the three open-ended questions asked of Goal Setting students, and response themes that emerged among the 34 participants.

1. How did using the goal template each week impact your goal setting skills?

Table 4.1. How did using the goal template each week impact your goal setting skills?

Themes	Frequency (themes found in written responses from 34 participants)	Percentage (of total response themes)*
Helpful		
Helped me understand what I would be studying; made my study goals specific/organized.	14	27%
Helped me choose study strategies/techniques to use.	8	15%
Taught me a new method of studying/setting goals	8	15%
Made me more accountable (e.g., forced me to set a goal and achieve it)	6	12%
Helped me use my study time better.	6	12%
Motivating/Gave me a sense of accomplishment.	3	6%
Made me more likely to achieve my goal because it was incorporated into the course.	1	2%
Did not impact positively or negatively		
Using a goal template did not impact my goal setting skills	5	10%
Not Helpful		
Took too much time - just another thing to do. I already study well.	1	2%

*Percentages may sum to greater than 100% due to rounding and multiple themes assigned to a single participant's response.

One comment ("they helped a fair amount") did not fit these themes and was not included in the table.

Overall, 88% of comments indicated the ACE IT goal setting template was helpful for students' goal setting. 10% of responses were neutral and indicated students did not think the ACE-IT goal-template impacted their goal setting, and about 2% of comments indicated that the goal template was not helpful for goal setting.

The most popular response (27%) to the question "How did using the goal template each week impact your goal setting skills?" expressed appreciation that the tool helped students focus on what they would study that week. It helped them be specific and organized, outlining clearly what content they needed to study. 15% of responses indicated the goal setting template helped them use a new method of studying/goal setting (e.g., "Helped break down the process in order to create/achieve the goal"). Another 15% of responses focused more on the study techniques provided (e.g., "It helped me decide upon what techniques to use and see which ones I preferred").

12% of responses indicated that using the goal setting template made them accountable (e.g., "it forced me to set a goal and follow it") and another 12% of responses reported the goal setting template helped them use their study time more efficiently (e.g. "it created a schedule for studying"; "It forced me to be more intentional with my time and what I wanted to accomplish each week, which also helped break down my workload…").

10% of responses reported the template did not affect their goal setting skills (e.g., "I frequently set very simple goals for myself while studying and in other elements of my life so this did not significantly impact my goal setting skills"). One person (2%) mentioned they were more likely to achieve their studying goals because it was incorporated into the course.

6% of responses indicated it was motivating to use a goal-template, which provided a sense of accomplishment (e.g., "The fact that it allowed me to set a goal meant that I had something to achieve while studying. That itself gave me a small boost

of determination"). One person indicated that the goal setting template was not helpful because they already study well, and it was just another task to complete.

Figure 4.1 shows a visual representation of all the different ways participants described the ACE IT template positively impacting their goal setting.

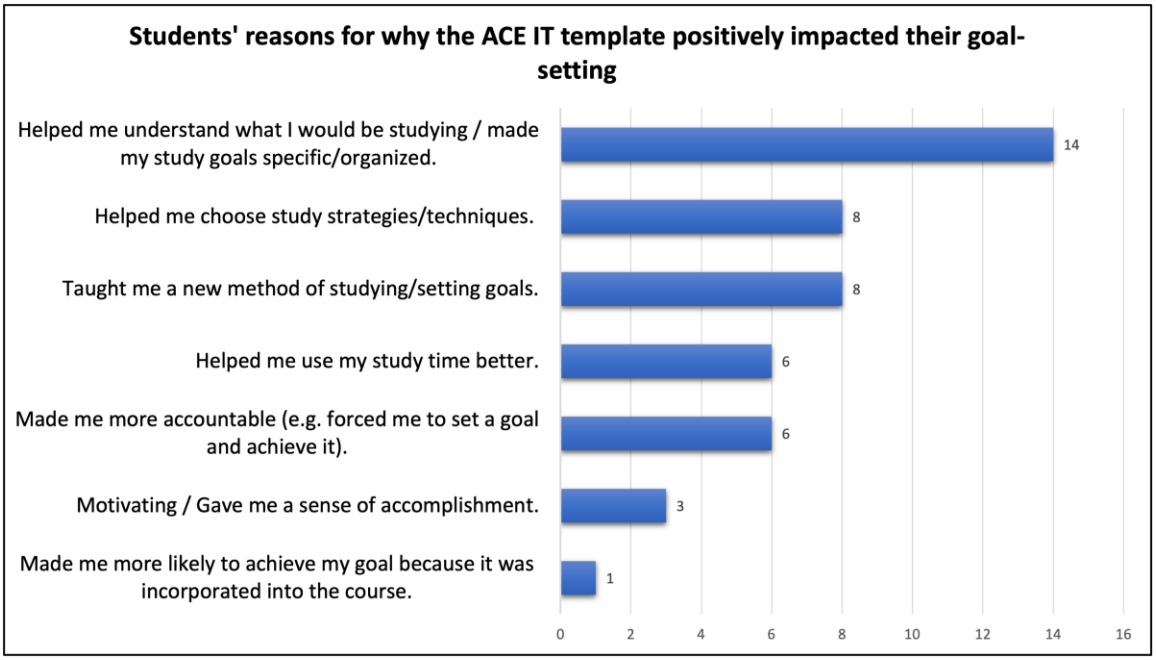


Figure 4.1. Students' reasons for how the ACE IT template positively impacted their goal setting

2. How did using the goal template each week affect your studying?

Table 4.2. How did using the goal template each week affect your studying?

Themes	Frequency (themes found in written responses from 34 participants)	Percentage (of total responses)*
Helpful		
Made me more accountable (e.g., forced me to set a goal; made it easier to get started with studying).	9	21%
Made me study every week (consistent studying/scheduled).	9	21%
Tried new study tactics/ study methods.	7	16%
Made me more aware of what I was studying and why.	7	16%
Motivating, gave me a sense of accomplishment.	2	5%
Increased my understanding of what I was studying.	3	7%
Made me prioritize studying for this course.	1	2%
Did not impact positively or negatively		
Using a goal template did not impact my studying	3	7%
Not Helpful		
Took too much time - just another thing to do. I already study well.	1	2%
Made me disappointed because I could not accomplish my goals.	1	2%

*Percentages may sum to less than or greater than 100% due to rounding and multiple themes assigned to a single response

Overall, 88% of comments were about how the ACE IT goal setting template was helpful for students' studying. Approximately 7% of responses were neutral and students did not think the ACE-IT goal template impacted their studying. There were about 4% of comments reflecting that the goal template was not helpful for those students' studying.

For the question "How did using the goal template each week affect your studying?" there were two most popular responses. One (21% of response themes) was students felt the goal-template made them more accountable with their studying, or

helped them get started and more likely to achieve the goal (e.g., “I found I was more on top of my studying and readings when I used the goal template because it held me accountable which was very helpful”). Another 21% of responses reflected that the goal template helped students be consistent, scheduled, and/or efficient with their studying time (e.g., “The goal template helped me improve my studying by quite a lot. I've started to study on a more regular basis now”; “I believe I was able to study more efficiently and use my times wisely as I have planned out my studying schedules”).

16% of responses focused on the study strategies (e.g., “It really pushed me to try new ways to study, and at the end of the day, I did find some new techniques that I will be using for my future classes!). A similar number of response themes (16%) were that the goal template helped to make them more aware of what they were studying and why (e.g., “Using goal template made me more aware of the material that I needed to study each week”).

7% of responses were that using the goal template helped students increase their understanding of what they were studying (e.g., “It helped me focus on the main parts of the content and I was able to understand the material”) and 5% of students found the goal template motivating for their studying (e.g., “mostly it affected my motivation and reminded me that I had the responsibility to accomplish it”). One student felt the goal template made them prioritize studying in the course for which they were creating the goal.

7% said the goal-template did not affect their studying in any way. Two people found the goal template hindered their studying; one (2%) because they already study well and felt it took too much time, and another (2%) because they felt disappointed when they could not accomplish the goal they had set.

Figure 4.2 shows a visual representation of all the different ways participants described the ACE IT template as positively impacting their studying.

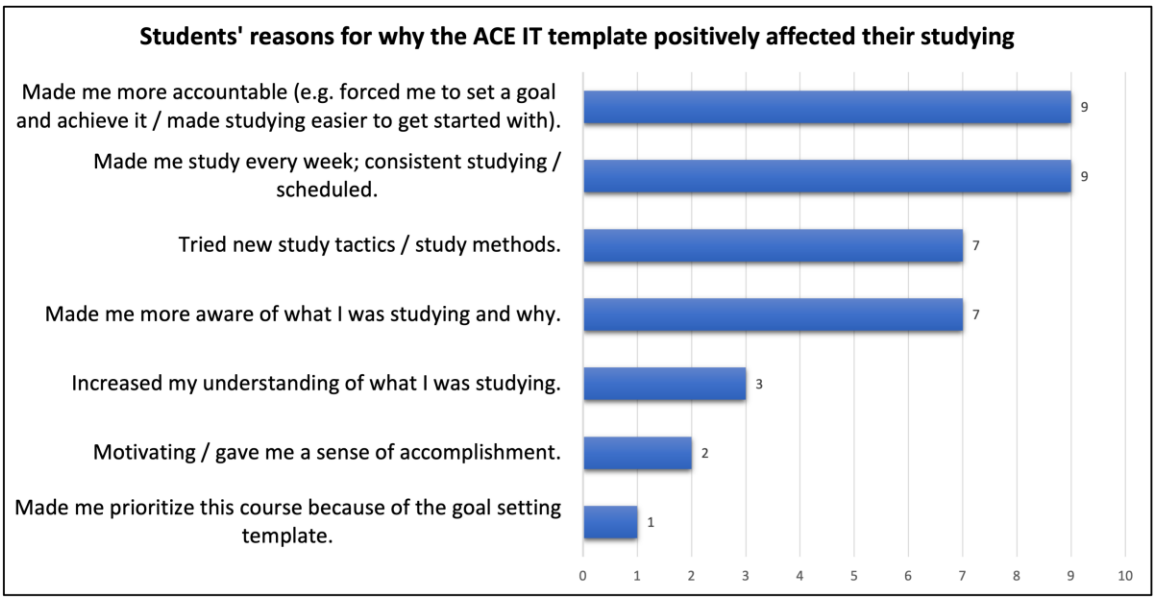


Figure 4.2. Students' reasons for why the ACE IT template helped their studying

3. How did using the goal template each week influence your motivation?

Table 4.3. How did using the goal template each week influence your motivation?

Themes	Frequency (themes found in written responses from 34 participants)	Percentage (of total responses)*
Helpful		
Made me more accountable to accomplish it, check it off (accountability).	10	21%
Having a schedule of what to study, when (an organized plan) was motivating.	7	15%
Increased my motivation (no reason given).	7	15%
Helped me stay on task / use my time wisely.	7	15%
Wanted to see how the study strategies could benefit me.	4	9%
Did not impact positively or negatively		
Did not influence my motivation.	10	21%
Increased my motivation at first, but once midterms came around my motivation decreased again.	1	2%
Not Helpful		
Took time I could have spent studying.	1	3%

*Percentages may sum to greater than 100% due to rounding and multiple themes assigned to a single response

There were two comments that did not fit these themes and were not included in the table: “It influenced my motivation a lot,” and “I was much more motivated each week.”

Figure 4.3 shows a visual representation of all the different ways participants described the ACE IT template affected their motivation.

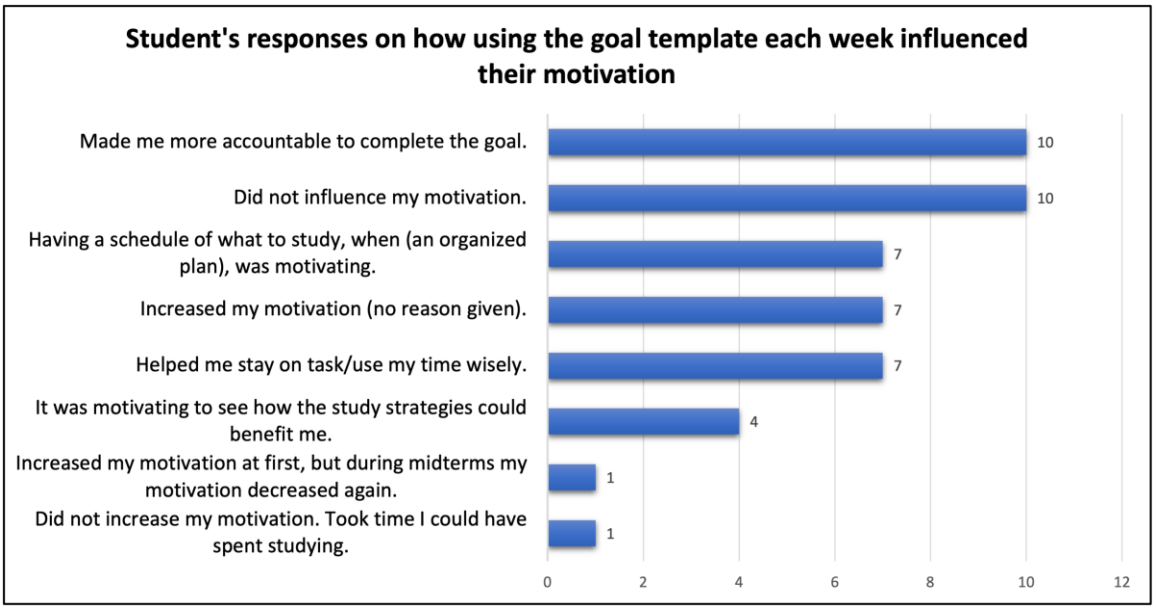


Figure 4.3. Students' responses on how the ACE IT goal template influenced their motivation

For the question "How did using the goal template each week influence your motivation?" there were two most popular responses. 21% of students reported that the goal template made them more accountable to complete the goal (e.g., "Achieving a goal felt really good, compared to not achieving a goal or having nothing to work towards. When there are no marks but you don't want to fall behind, it is good to set your own goals and achieve them, which I realized through my own personal motivation"). An equal percentage of responses (21%) were that the goal-template did not influence students' motivation.

15% of responses about the goal-template reflected it was motivating to have an organized plan (e.g., "It influenced my motivation because I had a certain time and day set out for studying so it motivated me when I knew what I was studying and when"). 15% of responses also reported that the goal template did increase motivation, but no specific reason was given by the students regarding how or why it increased motivation. Another 15% of responses were that the goal-template was motivating in that it helped the students stay on task and use their time wisely.

9% of responses focused on the Study Strategy Library – it was motivating for students to discover how the study strategies could benefit them (e.g., "It motivated me because I was excited to see if these study methods would really work for me!").

Finally, one person reported that the goal-template increased his motivation at first, "but once midterms came around my motivation decreased again." One student did not find the goal-template helpful and wrote "I delayed filling out the template because I did not want to spend the time that could otherwise be spent studying on completing the template."

Students' perceptions of the ACE IT template:

Further analysis of students' perceptions of the ACE IT template in the Goal Setting group specifically was done using the Likert responses to the Student Perceptions of the Goal Setting Task Questionnaire. Table 4.4 displays students' responses to various questions about the ACE IT template, and these data are also represented in Figure 4.4 with data collapsed to three columns: Agree/Strongly Agree, Neither Agree nor Disagree, and Disagree/Strongly Disagree, with the y-axis representing the number of students with that response.

Two questions which asked for open-ended responses are presented after Figure 4.4. Further analysis of the first question in the questionnaire, "The ACE IT template was helpful," considering students' final course grades, concludes this section's analysis of Student Perceptions of the Goal Setting Task Questionnaire.

Table 4.4. Student responses to the Perceptions of the Goal Setting Task Questionnaire (n=35)

	Strongly Agree	**Agree**	**Neither Agree nor Disagree**	**Disagree**	**Strongly Disagree**
The ACE IT template was helpful	6	21	5	3	0
Learning how to set goals using the ACE IT template was worthwhile.	10	16	4	4	1
Writing about why my goal was important in the goal template motivated me to achieve the goal.	10	11	6	4	4
Writing about potential obstacles and how I would overcome them helped me to achieve my goals.	5	16	8	4	2
All parts of the ACE IT template were relevant to my goal setting.	9	16	8	0	2
Using the ACE IT template for one goal a week helped motivate me to study harder for my other courses.	5	13	8	5	4

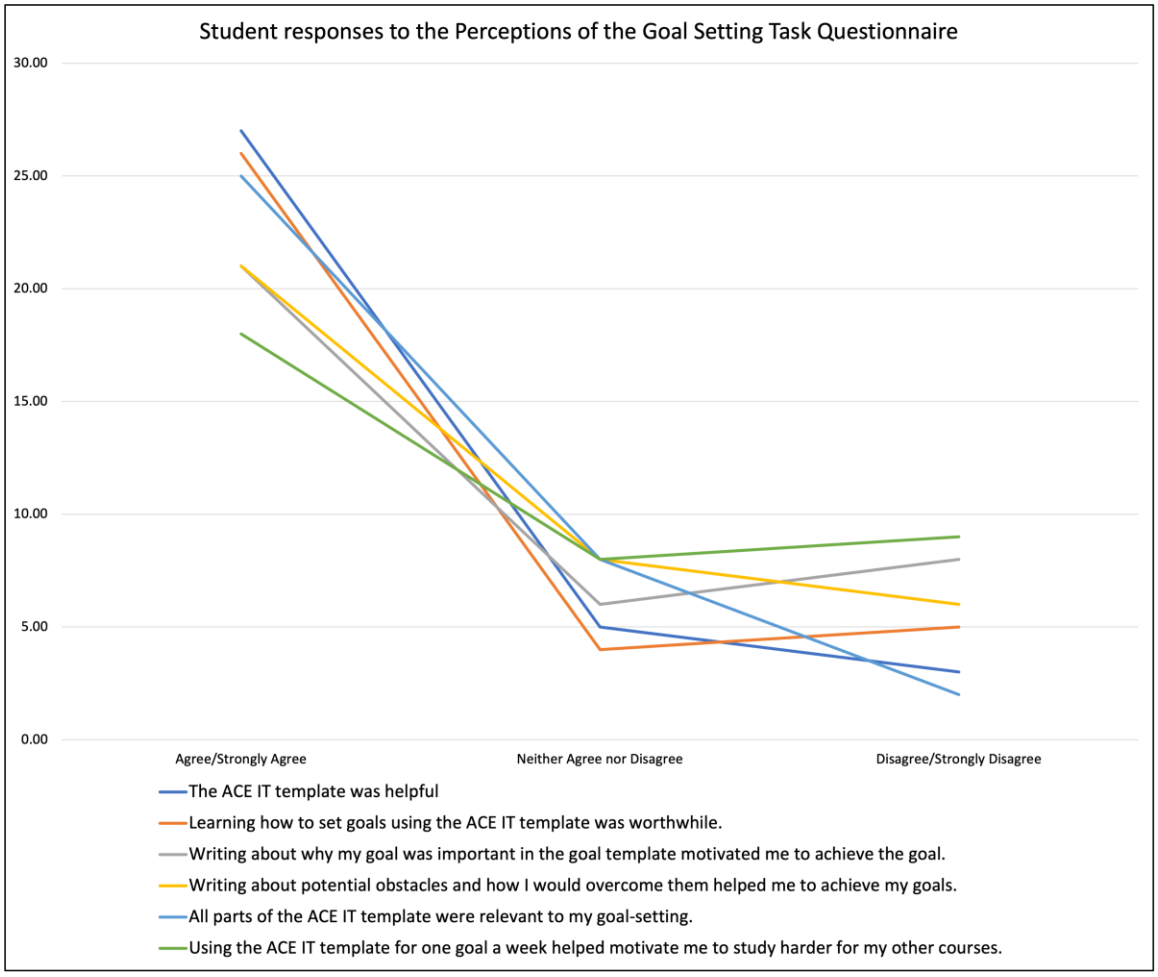


Figure 4.4. Student agreement levels to various questions about the ACE IT goal template.

As evident in Table 4.4 and Figure 4.4, most students chose "Agree" or "Strongly Agree" in response to the prompts about the ACE IT template. The two prompts which resulted in the most "Disagree" or "Strongly Disagree" selections were the ones which asked about motivation to complete the goal or motivation to study harder for other courses. Students were less likely to agree with these.

Students in the Goal Setting group (n=35) were asked, "If any parts of the ACE IT template – Action, Content, Evaluation/Efficacy, Importance, and Timeframe– were not relevant to you, please explain why."

Responses to this question fit into one of five categories:

1) All parts were relevant (74% of students (*n*=26) wrote a version of this)

2) The template did not affect my studying and therefore none of the parts were relevant (approx. 6% of responses, *n*=2)

3) Relating the goal to my future was not relevant (approx. 6% of responses, *n*=2)

4) Describing the importance of my goal was not relevant (11%, *n*=4) of responses – reporting a variety of reasons: found it repetitive; sometimes there is no importance for me; it is for school, so I assume it's important already), and

5) Content. "I tend to change the content I study as I'm going through the study session (1 person wrote this).

Additionally, students in the Goal Setting group were asked: "Would you continue to use the ACE IT goal setting template in your studying? Please supply a brief explanation."

Students responded either 'Yes' (49%), 'Maybe/Partly' (14%), or 'No' (37%). Select explanations provided by those who responded Yes (n=17) were:

> *"Yes because it challenged me to expand me viewpoint and techniques of studying! I always just viewed studying as taking notes and reviewing them, but with both the ACE IT and Study Strategy Library, my view has changed to a more diverse and bigger way of studying."*
>
> *"I will continue to use the ACE IT goal setting template especially when preparing for exams. This will help me think about how much time I need to dedicate to each subject and keep me accountable to my studies."*
>
> *"Yes, I looked forward to maintaining these habits because, I have been successful in my school semester this far."*
>
> *"I would definitely continue to use the ACE IT goal setting template in my studying because it outlines a perfect way to effectively plan out a goal for each week. Instead of simply coming up with goals and potentially never working towards it, structuring a solid plan to achieve your goal and considering the obstacles or importance behind the goal will help you be more motivated to push yourself and work harder."*
>
> *"I think so because I do find myself studying more than usual for all of my courses. Usually I find a specific day to studying everything, now I'm more inclined to break up my study so I study at least something for each week."*

The following are some explanations provided by students who responded that they might use the ACE IT template or partly use it (n=5):

> *"I think I will but altered a bit to fit my studying habits a bit more. I already started by writing in my weekly planner a checklist of what I want to accomplish each day, which I got inspired from this goal setting activity."*
>
> *"If I need motivation, then I will continue to use ACE IT. However, if I feel like I can continue studying without having motivation, I will not use it. I think I won't use it every week but for times when I do need motivation, I will use it."*
>
> *"I think I would continue to use but now that I'm familiar with it I wouldn't write everything down just really brief notes."*

Some explanations by those who responded No (n=13) were:

> *"Not really, the methods that I enjoy using and work for me are already methods that I was able to test throughout this study."*
>
> *"No I would not, unfortunately. Goal setting does not really work for me."*
>
> *"I wouldn't continue to use the template because I somehow don't want to rely on it. Rather, I should acknowledge my responsibility as a student that I need to accomplish my studying on time and be organized."*
>
> *"I don't think so, because although it was partially useful, I don't usually make goals ahead of time. I prefer that if I have time to do something, I'll just do it then."*
>
> *"No, it takes too long to do."*

A more in-depth analysis was done with the first prompt to students, "The ACE IT template was helpful," by adding in students' final course grade distribution from Fall 2019 and Spring 2020 Goal Setting groups in relation to their agreement to the question prompt. Figure 4.5 displays the proportion of each grade band corresponding to level of agreement. One student with a P (Pass) grade was removed from the chart because it is not known what letter grade the student would have received.

The statement "The ACE IT template was helpful" was chosen for this analysis because it would be interesting to find out if those students who achieved higher final grades in the class were also those who were most likely to find the structured goal template helpful for their studying.

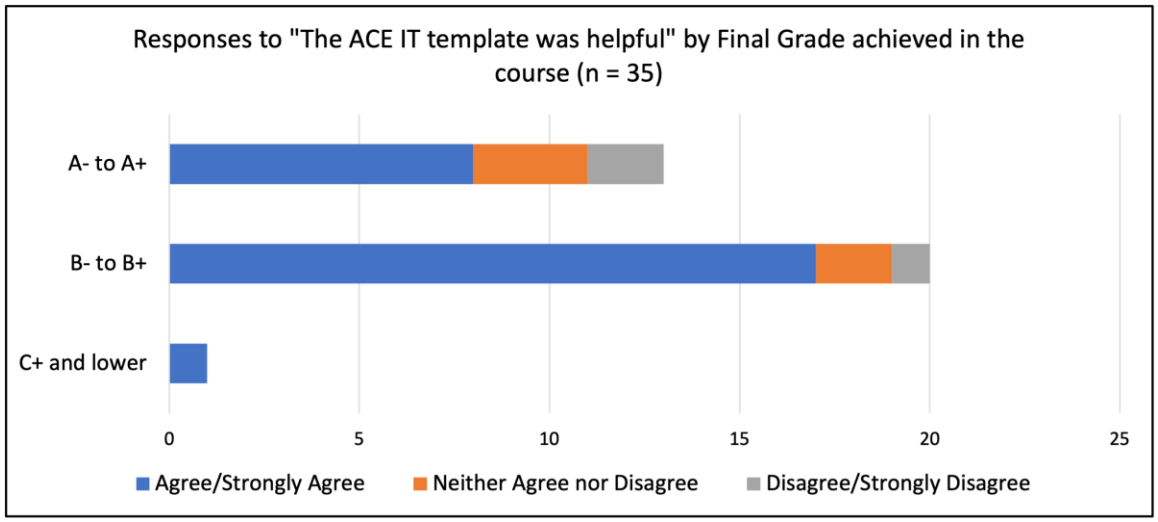


Figure 4.5. The proportion of each grade band corresponding to level of agreement.

Over 77% of responses to the prompt "*The ACE IT template was helpful*" were "Agree" or "Strongly Agree." 14% of respondents selected "Neither Agree nor Disagree," and approximately 9% of students disagreed with the statement. To determine whether there was any statistically detectable difference in responses based on final grade achieved, the grade data were grouped and given codes, e.g., a grade of C+ or lower = 1, B- to B+ = 2, and A- to A+ = 3. The student with a P grade was excluded from analysis because it cannot be known what their grade would be. A Spearman's rank-order correlation was calculated to determine the strength and direction of association between students' final course grade and their ratings, with the agreement ratings being coded as: Strongly Disagree = -2, Disagree = -1, Neither Agree nor Disagree = 0, Agree = 1, and Strongly Agree = 2. There was a statistically detectable positive correlation between students' grades and their level of agreement that the ACE IT goal setting template was helpful, ($r_s(32) = .384$, $p = .025$).

Spearman's rank correlation was used rather than a Pearson correlation because it is not assumed that the gap between each letter grade (e.g., A, B, C) is an equal interval and that students' final grades (which were originally percentages converted to letter grades in their transcript, are continuous variables). Similarly, it is not assumed that the

gap between Strongly Agree/Agree and Neither Agree nor Disagree is equal to the difference between Neither Agree nor Disagree and Disagree/Strongly Disagree.

4.1.2. Learning Diary Group

Listed below are the three open-ended questions asked of Learning Diary students, and response themes that emerged from the 41 participants.

1. How did filling out the learning diary each week impact your studying?

Table 4.5. How did filling out the learning diary each week impact your studying?

Themes	Frequency	Percentage (of total responses)*
Helpful		
Made me aware of/use (new) study strategies.	21	27%
Kept me accountable/focused on my studying.	16	22%
Allowed me to reflect on my studying habits.	16	22%
Gave me a chance to plan my studying for the week ahead.	14	19%
Gave me more motivation in my studying.	3	4%
Did not impact positively or negatively		
It didn't affect my studying.	3	4%
Not Helpful		
It hindered my studying to have to use the learning diary.	1	1%

*Percentages may sum to less than or greater than 100% due to rounding and multiple themes assigned to a single response

The majority of responses (27%) to the question "How did filling out the learning diary each week impact your studying?" reflected students' interest in being able to try different study strategies from the Study Strategy Library. This was followed by reporting that filling out the learning diary helped keep them accountable and focused with their studying (22%). The weekly plan and reflection gave students an opportunity to reflect on their studying habits (22%) and students also appreciated the chance to plan and organize their studying using the learning diary (19%).

4% of responses showed the learning diary gave students motivation in their studying (e.g., “I think the idea of having a pre-set plan ahead makes me more motivated to study”). 4% of students said the learning diary did not affect their studying, and one student (1%) reported the learning diary hindered his studying (“It slightly hindered my studying knowing that I had to study via a different method than what I have honed and enjoyed doing over the years in schooling”).

Figure 4.6 shows a visual representation of all the different ways that participants in the LD group described how the earning diary affected their studying.

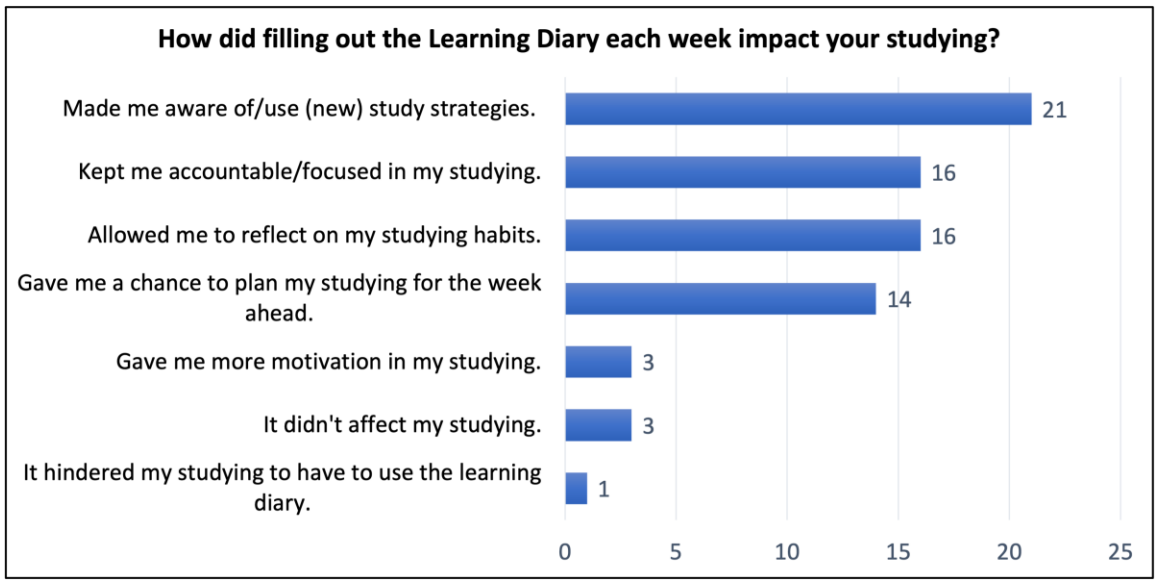


Figure 4.6. Students’ responses to how using the learning diary impacted their studying

2. How did filling out the learning diary each week impact your motivation?

Table 4.6. How did filling out the learning diary each week impact your motivation?

Themes	Frequency	Percentage (of total responses)*
Helpful		
Made me motivated to study/complete what I filled out/accomplish my plan.	21	40%
Motivated me to try new/effective study strategies.	6	11%
Gave me a place to start with planning my studying.	5	9%
It was motivating to have regular check-ins (i.e.. Create weekly plans).	5	9%
It was motivating to reflect on my studying.	4	8%
It motivated me to study hard for my other classes.	1	2%
Did not impact positively or negatively		
It didn't affect my motivation.	11	21%

*Percentages may sum to greater than 100% due to rounding and multiple themes assigned to a single response

When asked how the learning diary impacted their motivation, most students (40%) responded that it helped motivate them to study or accomplish the plan they had created (e.g., "It helped my motivation a lot. The learning diary forced me to stay on top of things"). This was followed by 21% of students reporting that the learning diary did not affect their motivation. 11% of responses focused on the Study Strategy Library, reflecting that it was motivating to try new study strategies (e.g., "It motivated me to try more effective learning strategies") and 9% of responses reflected that it was motivating to have regular check-ins (e.g. "Filling out the learning diary positively impacted my motivation. I liked having the regular check-ins as reminders to focus on my study habits."). 9% of the time students found it motivating that the learning diary provided a way to get started with planning their studying, and 8% of responses said it was motivating to reflect on one's studying at the end of each week. One person felt using the learning diary helped motivate them to study hard for their other classes as well ("It increased my motivation to study hard for all my classes and make study plans for my

other classes. I procrastinated less and actually stayed on top of my assignments and studying.").

Figure 4.7 shows a visual representation of all the different ways that participants in the LD group described how the learning diary affected their motivation.

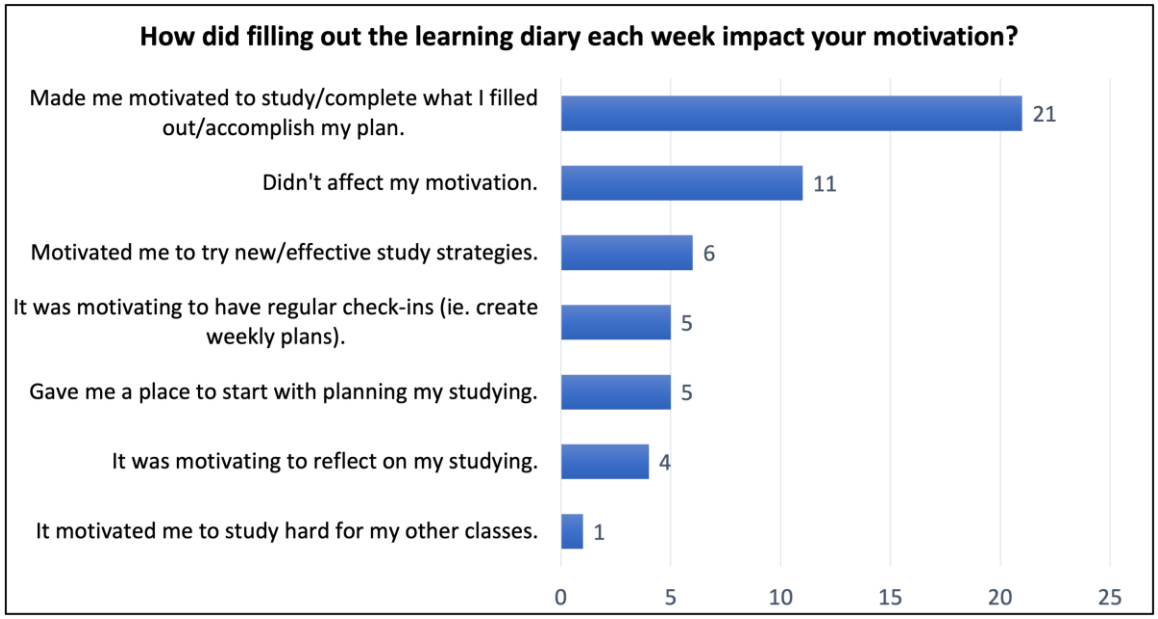


Figure 4.7. Students' responses to how using the learning diary impacted their motivation

Students' perceptions of the Learning Diary:

To maintain comparability with the analysis of Goal Setting students' Likert responses, analysis of students' perceptions of the learning diary template specifically was done using the Likert responses to the Student Perceptions of the Learning Diary Task Questionnaire (Table 4.7 and Figure 4.8).

Table 4.7. Student response to the Student Perceptions of the Learning Diary Task Questionnaire (n=41)

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
The learning diary was helpful.	10	24	6	1	0
Using the learning diary has been a worthwhile use of my time.	11	19	8	3	0
Using the learning diary each week helped motivate me to study harder for my other courses, which I didn't use a learning diary for.	7	15	11	5	3

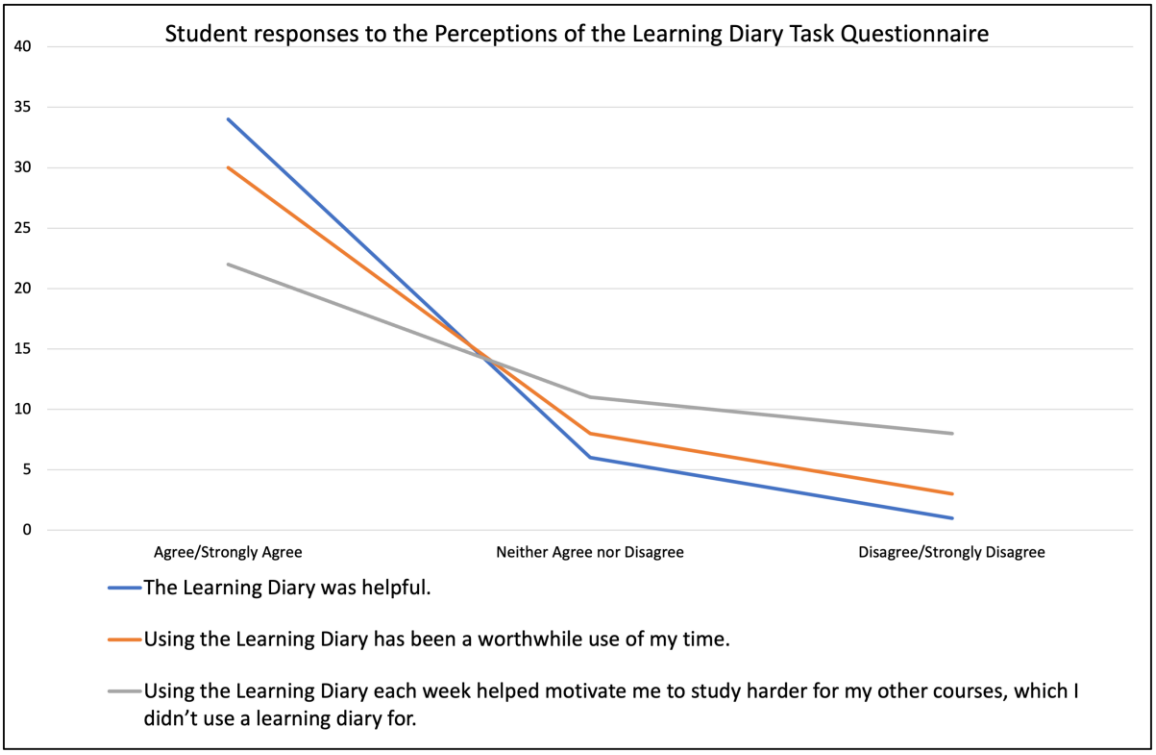


Figure 4.8. Student agreement levels to various questions about the Learning Diary.

Students in the LD group were asked, "Would you continue to use the learning diary in your studying? Please supply a brief explanation."

Students responded either ‘Yes’ (46%), ‘Maybe/Partly’ (15%), or ‘No’ (39%). For those who responded Yes (n=19), here are some explanations they provided:

> *“Of course, I can evaluate my study plan, ensure what kind of study goals and skills would be appropriate.”*
>
> *“Yes I would, I think taking 5-10 minutes out of your day to think of the week ahead in terms of studying is extremely helpful and beneficial so I have no reason not to continue using some sort of Learning Diary method.”*
>
> *“I would continue to use the Learning Diary in my studying by setting goals for each class and reviewing them.”*
>
> *“Yes I would as it kept me more accountable for the work I had to do each week. It also helped motivate me to do the work as I had set a personal goal for myself every week to get some work done. Overall I found it very helpful to do a diary every week just to keep me on track for the weeks I used it for.”*

For those who responded that they might use the ACE IT template or partly use it (n=6), here are some explanations they provided:

> *“Not a weekly learning diary but setting a goal to use a certain strategy for a study period is what I'm taking from this.”*
>
> *“I would if I had one accessible to me. I can sometimes become overwhelmed and disorganized which I feel hinders my studying abilities. This semester I have found myself making more lists and studying structures and doing better in my courses.”*
>
> *“I would like to try. It was a good way for me to stay on top of things, however, it could at times be a little time-consuming.”*

For those who responded No (n=16), here are some explanations they provided:

> *“No, I found it time consuming to reflect on. I would rather have a series of the strategies to refer to if needed but not reflecting each week.”*
>
> *“I would not use the Learning Diary because I find that the study strategy library was more beneficial for my academics.”*
>
> *“No, because switching methods and noting down my habits as well as how I think each strategy works takes up too much time with little payoff especially when I know my study method. There is no need to waste time in my schedule when it could be used for studying rather than keeping track of how my learning is progressing. Time thinking of how I'm learning distracts me from learning.”*

From all the "No" responses, (n=16), 25% of them said they would still like to use the Study Strategies (from the SSL), but the learning diary itself did not work for them.

4.1.3. Comparing Goal Setting and Learning Diary responses

Following is a comparison between the GS and LD groups based on the similar themes found in students' open-ended responses to the respective questions given to each group. I reworded some of the themes found in students' open-ended responses to better match and compare themes between GS and LD, and converted response frequencies to percentages:

1) How did using the goal template each week affect your studying? / How did filling out the learning diary each week impact your studying?

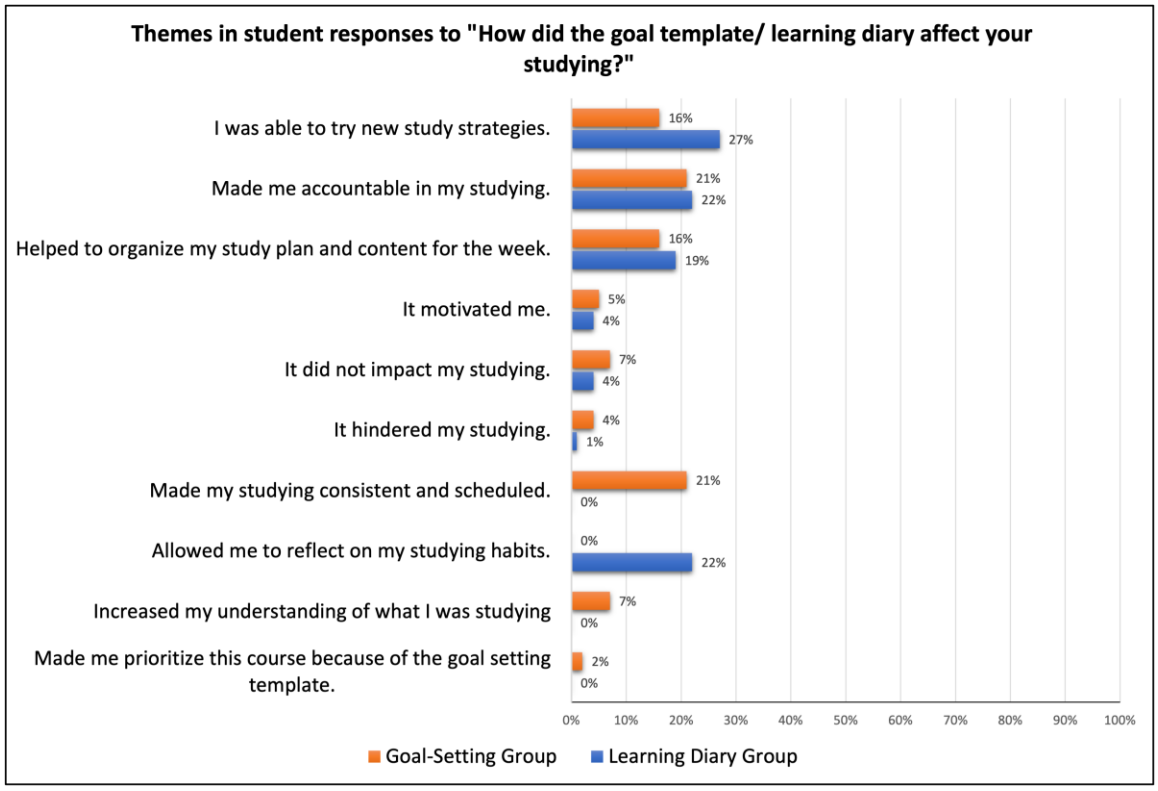


Figure 4.9. The percentage of each theme arising from student responses across the LD and GS groups to "How did the goal template/learning diary affect your studying?"

From Figure 4.9, about one-fifth of students in both groups appreciated the Study Strategy Library which suggested new study strategies, though this was a stronger theme among the LD students (27%) than GS students (16%). Even though the ACE IT goal template was meant to help students organize their studying for the week ahead, a similar percentage of LD students (19%) and GS students (16%) felt that their interventions helped them organize their studying for the week ahead. About a fifth of students in both groups felt more accountable in their studying with the use of the provided templates (LD = 22%, GS = 21%). No LD students mentioned their studying becoming consistent and scheduled with their provided template, however this was a theme among students who used the ACE IT template (21%) to put in specific days, times, and duration in which they would complete their goal. No GS students mentioned reflection in their open-ended responses, however this was a notable theme among the LD group (22%), who reported the learning diary allowed them to reflect on their studying habits.

A conventional approach to investigating differences between groups to the questions "How did using the goal template/learning diary affect your studying?" and "How did the goal template/learning diary impact your motivation?" is to calculate a multivariate Hotelling T^2 comparing the groups. Another approach is to calculate a binary logistic regression predicting group membership using students' responses to these questions as predictors of group membership. This approach generates a statistic, like the Hotelling T^2, identifying whether groups are statistically detectably different based on their responses and the percent of variance accounted for due to group membership. An advantage of using logistic regression not available in the Hotelling T^2 method is generating a measure of importance of responses provided by logistic regression coefficients.

A standard binary logistical regression was used to model the binary variable of Group condition (using GS – Goal Setting – as the reference category) using as predictor variables the various themes students wrote about when responding to the question 'How did using the goal template each week affect your studying? / How did filling out the learning diary each week impact your studying?" Based on a classification threshold predicted probability of target group membership as .5, results of the logistic analysis

indicated that the two-predictor model with the themes "I was able to try new study strategies" and "It made me accountable in my studying" provided a statistically detectable prediction of group membership, X^2 (10, N = 76) = 48.865, $p < .001$. The Nagelkerke pseudo R^2 indicated that the model accounted for approximately 63% of the total variance. Classification success for the cases (themes students identified) based on a classification cutoff value of .500 for predicting membership in the Goal Setting group was moderately high, with an overall prediction success rate of 79% and correct prediction rates of 91% for Goal Setting group participants and 68% for Learning Diary (LD) group participants.

Table 4.8 presents the partial regression coefficients, the Wald test, the odds ratio [Exp(*B*)], and the 95% confidence intervals (CI) for odds ratios for each predictor.

Table 4.8. Binary Logistic Regression Results for "How did the goal template/learning diary affect your studying?"

Model	*b*	*SE-b*	Wald	df	Exp(*B*)	95% CI Exp (*B*)
Allowed me to reflect on my studying habits	21.967	9146.942	.000	1	3.469E+9	.000
Made me prioritize this course because of the goal setting template	-18.916	40192.970	.000	1	.000	.000
Increased my understanding of what I was studying	-20.425	22462.443	.000	1	.000	.000
Made my studying consistent and scheduled	-20.941	11969.763	.000	1	.000	.000
It hindered my studying	1.593	1.640	.943	1	4.920	.198-122.543
It did not impact my studying	1.881	1.423	1.748	1	6.560	.403-106.653
It motivated me	2.579	1.571	2.696	1	13.181	.607-286.360
Helped to organize my study plan and content for the week	1.627	1.032	2.488	1	5.088	.674-38.424
Made me accountable in my studying*	1.889	.958	3.889	1	6.611	1.012-43.198
I was able to try new study strategies*	2.127	1.022	4.329	1	8.390	1.131-62.225

Note. The dependent variable was group condition (GS or LD) with Goal Setting as the reference category and Learning Diary as the target category; Nagelkerke $R^2 = .634$.
* $p < .05$.

The purpose of the binary logistical regression was to use the themes participants provided as predictors of group membership – which themes correspond more to the Goal

Setting or Learning Diary groups? When given a pattern of responses for an individual, there is a 79% chance that you can predict whether the individual is from the GS group or LD group. There are two themes that by themselves make a statistically detectable contribution to group membership, which are "I was able to try new study strategies" and "It made me accountable in my studying." Thus, knowing the response to these two themes, makes group identification easier. About three out of four times, knowing how a student responded to the question, it is possible to predict correctly what group an student was in during the intervention. There is about a 4/6 chance of guessing correctly for the Learning Diary group and more than a 5/6 chance in the Goal Setting group, when both predictors are present.

2) How did using the goal template each week influence your motivation? / How did filling out the learning diary each week impact your motivation?

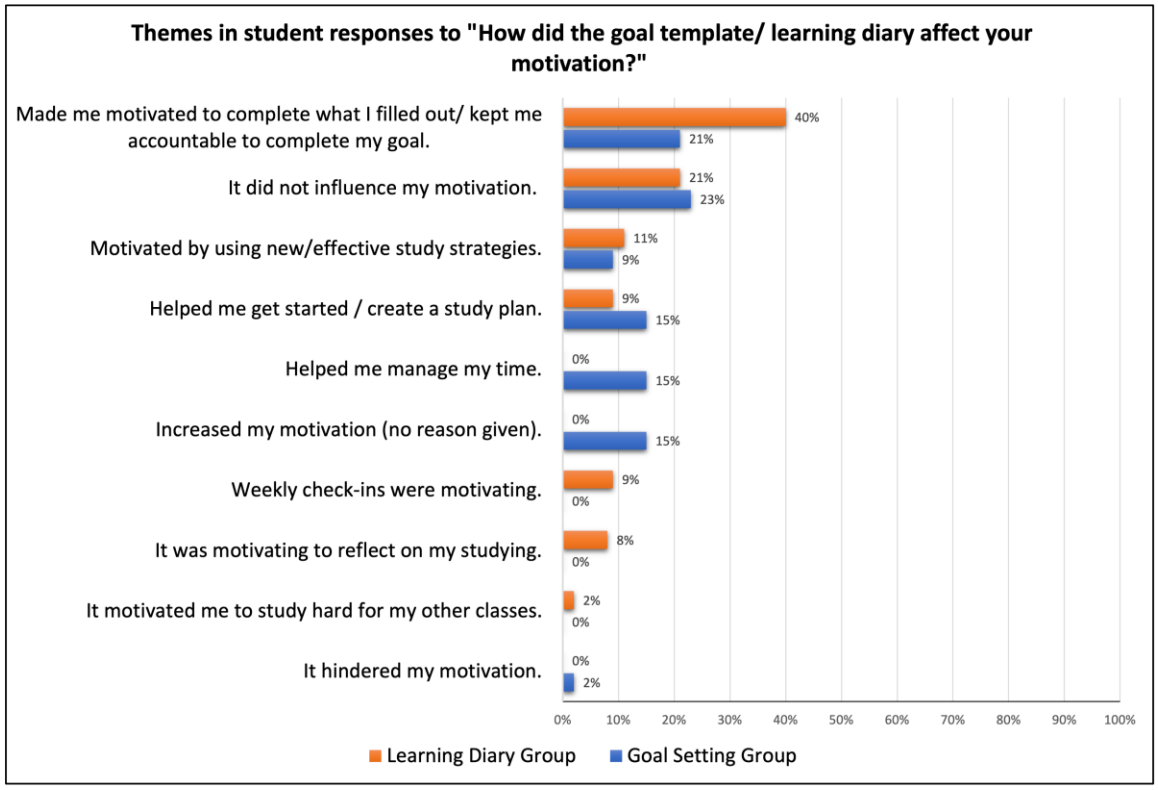


Figure 4.10. The percentage of each theme arising from student responses across the LD and GS groups to "How did the goal template/ learning diary affect your motivation?"

Motivation was not defined specifically when asking students this question. This is because the question was meant to allow students to interpret motivation in their own way. This allows the greatest opportunity for variance in student responses when open-ended responses were categorized into themes.

From Figure 4.10, approximately 75% of participants in each group provided a reason why the intervention was positively motivating to them. A smaller portion of students reported the Learning Plan (21%) / Goal Template (23%) did not affect their motivation, or hindered their motivation (Goal Setting group – 2%).

What both groups found motivating about the provided study templates was that they helped with accountability. It was motivating to fill out a plan and complete it (LD = 40%, GS = 21%). Some students in noth groups felt it helped them when getting started with their studying and planning their studying (GS = 15%, LD = 9%), and some students appreciated trying new, beneficial study strategies (LD = 11%, GS = 9%).

No LD students mentioned time management as a motivating factor from participating in creating their learning plans, although this was mentioned by 15% of the GS group who used the ACE IT template to put in specific days, times, and duration in which they would complete their goal. No GS students mentioned reflection in their open-ended responses, however this was slightly present among the LD group (8%), who reported it was motivating to reflect on their studying habits. The LD group also mentioned that the weekly check-ins to create a new plan were motivating (9%).

A standard binary logistical regression was used to model the binary variable of Group condition using GS – Goal Setting – as the reference category. The predictor variables in this analysis were the various themes students wrote about when responding to the question ‘How did using the goal template each week influence your motivation? / How did filling out the learning diary each week impact your motivation?” Based on a classification threshold that predicted probability of target group membership as .5, results of the logistic analysis indicated that the two-predictor model with the themes “I was motivated to try new/effective study strategies” and “It made me motivated to stay accountable/complete what I filled out” provided a statistically detectable prediction of

group membership, X^2 (10, N = 76) = 46.413, p < .001. The Nagelkerke pseudo R^2 indicated that the model accounted for approximately 61% of the total variance. Classification success for the cases (themes students identified) based on a classification cutoff value of .500 for predicting membership in the Goal Setting group was moderate high, with an overall prediction success rate of 78% and correct prediction rates of 54% for Goal Setting group participants and 98% for Learning Diary (LD) group participants.

Table 4.9 presents the partial regression coefficients, the Wald test, the odds ratio [Exp(*B*)], and the 95% confidence intervals (CI) for odds ratios for each predictor.

Table 4.9. Binary Logistic Regression Results for "How did the goal template/ learning diary affect your motivation?"

Model	*b*	*SE-b*	Wald	df	Exp(*B*)	95% CI Exp (*B*)
It hindered my motivation	-21.298	40192.970	.000	1	.000	.000
It motivated me to study hard for my other classes	22.081	40192.969	.000	1	3.888E+9	.000
It was motivating to reflect on my studying	20.784	18538.094	.000	1	1.062E+9	.000
Weekly check-ins were motivating	20.469	15840.250	.000	1	775499412	.000
Increased my motivation (no reason given)	-40.168	14679.151	.000	1	.000	.000
Helped me manage my time	-40.152	14597.985	.000	1	.000	.000
Helped me get started/create a study plan	-.957	1.115	.737	1	.384	.043-3.414
Motivated by using new/effective study strategies	20.139	8123.176	.000	1	557742335	.000
It did not influence my motivation	.974	1.324	.541	1	2.647	.198-35.475
Made me motivated to complete what I filled out/kept me accountable to complete my goal	1.951	1.279	2.327	1	7.037	.573-86.362

Note. The dependent variable was group condition (GS or LD) with Goal Setting as the reference category and Learning Diary as the target category; Nagelkerke R^2 = .611.

No themes by themselves made a statistically detectable contribution, although the theme about the goal template / learning diary keeping students motivated to stay accountable in completing their goal/study plan potentially makes the most impact at p = .127. From the results of this logistic regression, there is an overall prediction success

rate of 78%. When given a pattern of responses, there is a 98% chance of predicting correctly that the individual with those responses is in the LD group. There is a 54% chance of predicting correctly that the individual with those responses is in the GS group.

4.2. Research Question 2: How do students fill out and use a structured goal setting template?

A rubric was created to score students' self-set goals when using the ACE IT goal template. This analysis was completed for those students from the Goal Setting group across Fall 2019 (n = 12) and Spring 2020 (n = 25), who followed the structured ACE IT template. A scoring scheme described in Table 4.10 was developed for each item in the goal template, and two co-raters (myself and a colleague) coded each item independently. Any discrepancies were discussed, and a final agreement was reached for each text response. The purpose of this research question was to see whether participants were able to follow the goal template structure and input the appropriate information, as this was unreliable in the past (McCardle et al., 2017; Webster et al., 2012).

Table 4.10. Scoring scheme for ACE IT goal template

Criteria	To receive a 1 score, students included…	To receive a 0 score…
Study Strategy	A study strategy from the SSL	Did not include a study strategy from the SSL
Topic	A topic title/ chapter title to study	Contains no topic specificity.
Evaluation	A standard to judge learning (to be able to do something cognitively)	No standards set. OR, the standard is completing a task.
Obstacle	A relevant obstacle to their goal.	No obstacles included. OR a generic, irrelevant obstacle.
Overcoming obstacle	A plan to overcome their obstacle.	No plans included, or a plan not relevant to their obstacle.
Confidence	A confidence rating from Not at all Confident to Very Confident.	N/A. All students chose a confidence rating.
Importance	Why this specific goal is important to them personally	Students did not connect this goal to any personal importance
Future	How this goal is connected to their future plans (education or career related).	Students did not relate their goal to any future plans.
Commitment	A commitment score from 1 to 100.	A commitment score of 0. If a student is indicating 0% commitment, they should be creating a different goal.
Time	A specific number of hours for the goal.	No number of hours given for the goal.
Day	Specific days during which they will work on this goal.	No specific days were chosen to work on the goal.

Goals were categorized during data analysis as Complete goals (all components of the goal template completed accurately), Mostly Complete goals (1 missing/vague element in the goal template), Partially Complete goals (2 missing/vague elements in the goal template), or Incomplete goals (3 or more missing/incomplete elements in the goal template). Each student's goal in each of Weeks 1-4 for Fall 2019 (Table 4.11) and Spring 2020 (Table 4.12) was assigned a code.

In past literature, goals that had the characteristics of a Complete goal were called Exemplar, goals with Mostly Complete characteristics were Excellent goals, and Partially

Complete goals were categorized as Good (Beckman et al., 2021). Incomplete goals are akin to Weak or Basic goals in past research (Beckman et al., 2021).

Table 4.11. Fall 2019 Participants' Goals through Weeks 1 – 4

Participant #	Week 1	Week 2	Week 3	Week 4
100	Complete	Complete	Complete	Complete
101	Partially Complete	Complete	Mostly Complete	Mostly Complete
102	Complete	Complete	Partially Complete	Incomplete
103	Complete	Complete	Complete	Mostly Complete
104	Complete	Complete	Complete	Partially Complete
105	Mostly Complete	Complete	Partially Complete	Complete
106	Complete	Partially Complete	Partially Complete	Incomplete
107	Mostly Complete	Complete	Mostly Complete	Mostly Complete
108	Complete	Complete	Complete	Partially Complete
109	Complete	Complete	Mostly Complete	Partially Complete
110	Complete	Complete	Complete	Complete
111	Mostly Complete	Complete	Partially Complete	Mostly Complete

For Fall 2019 students, in Week 1 there were some incomplete items for the Importance and Future elements. In Week 2, only one person had incomplete items on the ACE IT goal template, which were the "future" component, and they rated their commitment to this goal as 0, so this was counted as an incomplete element as well, that they were creating a goal to which they were 0% committed. Most of the missing items in Week 3 of the Fall 2019 group were no specific time indicated to work on the goal, and there were some incompletes / vague responses for the "importance" and "future" items. Most of the missing items in Week 4 of the Fall 2019 group were lack of topic specificity. Students were writing that they must study "topics related to the exam" or "Studying for the midterm," and not any specific topics for the week. There were also some 0's for evaluation, in that students did not set standards that were measurable in any way or could be assessed to see whether they had achieved their goal. A couple of the missing elements were in the importance and future relevance components.

There do not appear to be clear trends or patterns in participants' accuracy of goal completion throughout the four weeks, although it is apparent that in the fourth week, lack of topic specificity was present due to participants making goals to study everything for the midterm, rather than identifying specific topics.

Table 4.12. Spring 2020 Participants' Goal Codes through Weeks 1 – 4

Participant #	Week 1	Week 2	Week 3	Week 4
401	Complete	Mostly Complete	Complete	Mostly Complete
402	Mostly Complete	Complete	Complete	Mostly Complete
403	Mostly Complete	Mostly Complete	Partially Complete	Partially Complete
404	Complete	Complete	Mostly Complete	Partially Complete
405	Complete	Partially Complete	Mostly Complete	Complete
406	Complete	Complete	Mostly Complete	Partially Complete
407	Complete	Mostly Complete	Complete	Mostly Complete
408	Complete	Complete	Complete	Complete
409	Complete	Complete	Mostly Complete	Mostly Complete
410	Complete	Mostly Complete	Complete	Complete
411	Complete	Partially Complete	Mostly Complete	Incomplete
412	Complete	Complete	Partially Complete	Complete
413	Complete	Mostly Complete	Complete	Complete
414	Complete	Mostly Complete	Complete	Complete
415	Complete	Complete	Complete	Complete
416	Complete	Partially Complete	Complete	Complete
417	Complete	Complete	Complete	Complete
418	Complete	Mostly Complete	Complete	Complete
419	Complete	Complete	Complete	Complete
420	Mostly Complete	Incomplete	Mostly Complete	Mostly Complete
421	Complete	Partially Complete	Complete	Mostly Complete
422	Complete	Mostly Complete	Mostly Complete	Partially Complete
423	Complete	Complete	Complete	Complete
424	Mostly Complete	Partially Complete	Mostly Complete	Incomplete
425	Partially Complete	Partially Complete	Incomplete	Incomplete

During Spring 2020, most students did not have issues following the ACE IT goal template in Week 1. In Week 2, many students missed correctly filling out the "importance" component of the goal template. In Week 3, students had difficulty setting a standard by which they could assess their achievement of their goal (Evaluation), and some did not identify how their goal was related to their educational or personal values (Importance). In Week 4, students were lacking topic specificity, the importance component, and the evaluation component of the ACE IT goal template.

For more information about the frequency of each of the study strategies students chose, see Figure 4.18 in section 4.3.

Goal Quality and Academic Performance

From Tables 4.11 and 4.12, each student's goal quality was converted to a number, (i.e., Complete = 4, Mostly Complete = 3, Partially Complete = 2, Incomplete = 1), and an average goal quality score was calculated for each student over the four weeks. Skewness and kurtosis values for these variables were within usually accepted ranges of approximately ±1. These goal qualities were then compared to students' final grades in their Education course, to determine if there was any correlation between the quality of goals a student tends to set throughout the four weeks, and their academic performance in the course.

Two participants from the Fall 2019 group were removed from analysis because they were missing GPA scores. One participant from the Spring 2020 group was removed because they elected P/F grading rather than a numerical score.

A Pearson correlation coefficient was computed to assess the linear relationship between students' goal quality score and their final grade in the course. There was a positive correlation between the two variables, $r(32) = .415$, $p < .05$. Thus, those students with higher goal quality ended up with higher grades in the course for which they were instructed to create the goals.

4.3. Research Question 3: What affects students' successes and failures at goal attainment when using a goal template?

This research question was answered by examining the combined Fall 2019 and Spring 2020 data from goal setting reflections about the preceding week. Students in the GS group completed these reflections at the start of each subsequent goal setting session. Table 4.13 shows students' responses from the Goal Setting group across Fall 2019 and Spring 2020 (n = 37) from Week 1- 4 to the question "Did you achieve your goal from last week?" The data is also represented in Figure 4.11. It is important to note that 6 participants in the Goal Setting group did not complete the reflection in Week 4, so it is unclear what their goal achievement was in the last week.

Table 4.13. Responses to: "Did you achieve your goal from last week?"

	Week 1	Week 2	Week 3	Week 4	Total
Yes. I achieved my goal for the week	17	18	23	23	81
Somewhat. I was partly successful in achieving my goal for the week.	16	13	9	3	41
Undecided. I am not sure if I achieved my goal for the week.	1	1	3	1	6
No. I did not achieve my goal for the week	3	5	2	4	14

Note: *n*=37 for Weeks 1-3, *n*=31 for Week 4 due to some students not completing the reflection

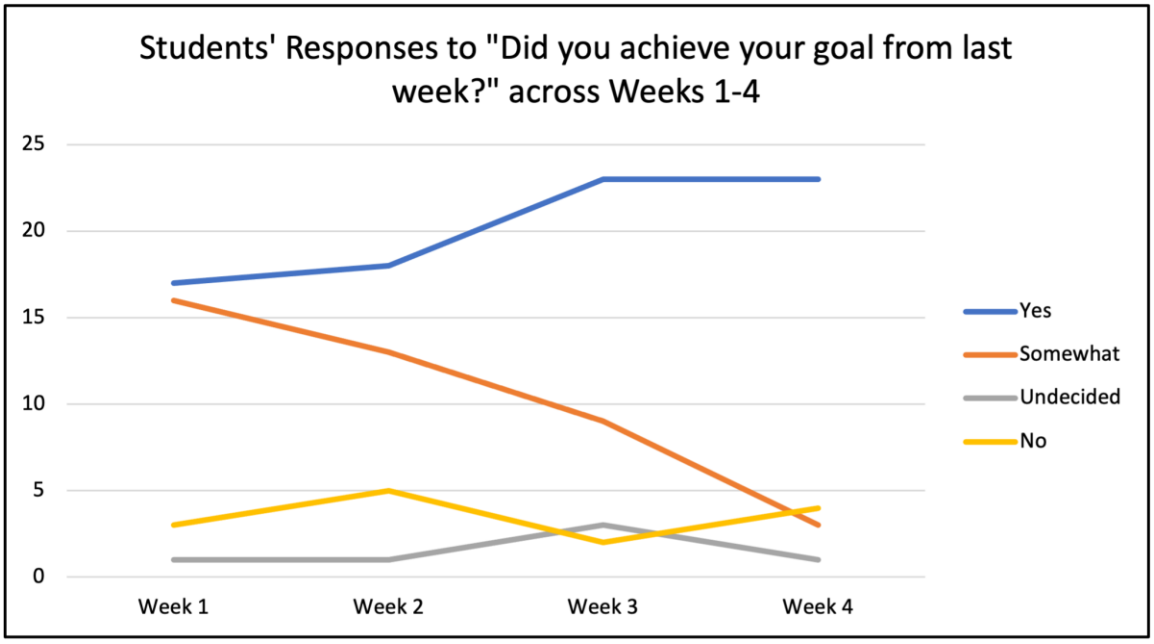


Figure 4.11. Student responses about their goal achievement across Weeks 1-4

For participants who answered "**Yes**. I achieved my goal for the week," Figure 4.12 displays the frequency, aggregated over weeks, of each reason people chose when responding to the item "**What <u>helped</u> you achieve your goal for the week?"** Participants could choose more than one reason.

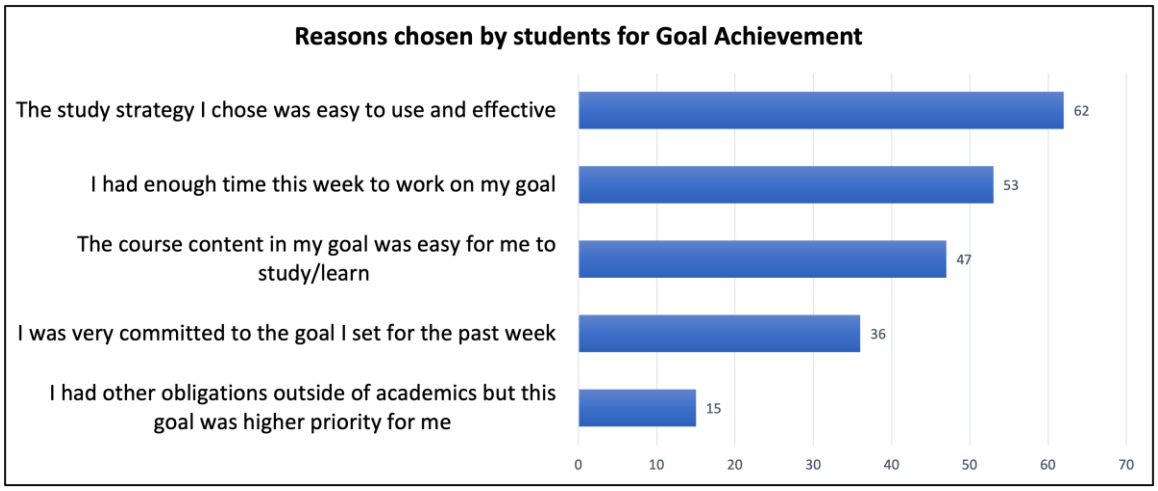


Figure 4.12. Reasons chosen by students for successful goal achievement.

When participants reported what helped them achieve their goals, the most popular selection was "The study strategy I chose was easy to use and effective," (chosen 62 times by students) followed closely by "I had enough time this week to work on my goal" (selected 53 times by students). The least popular selection was "I had other obligations outside of academics but this goal was higher priority for me" (selected 15 times by students). No participants indicated an "other" reason.

For participants who answered "**No**. I did not achieve my goal for the week," when reflecting on Weeks 1-4, Figure 4.13 displays the frequency of each reason people chose when responding to the item "**What made it harder for you to achieve your goal for the week?"** (Participants could choose more than one reason).

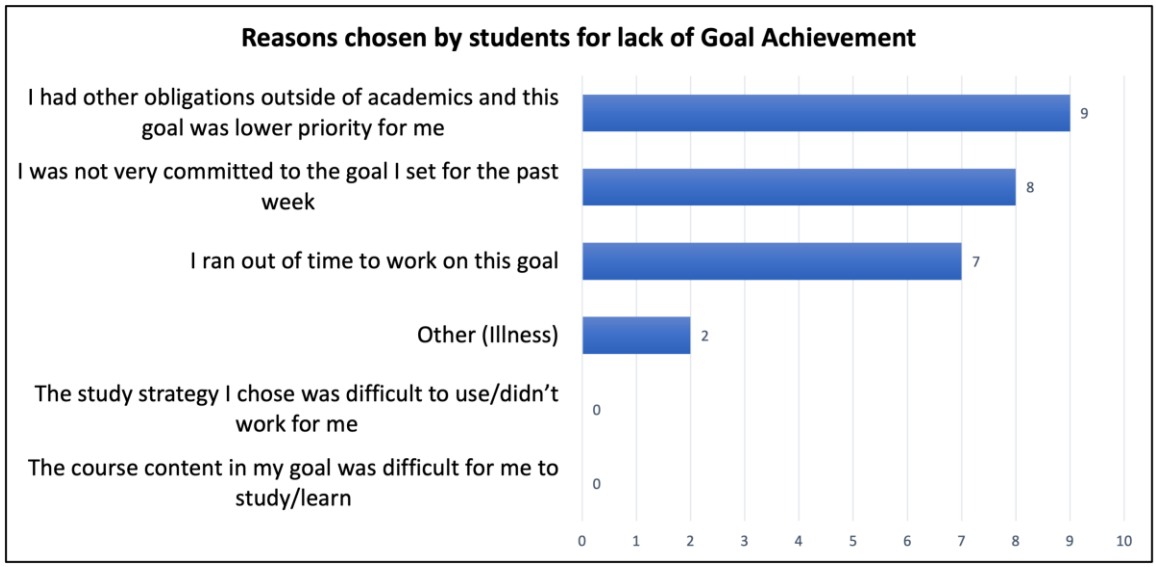
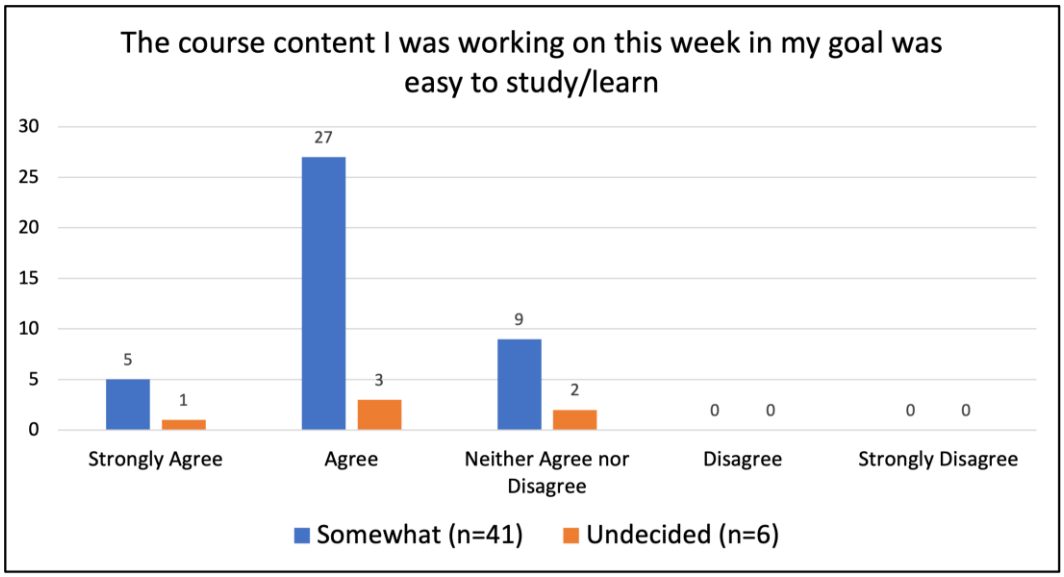


Figure 4.13. Reasons chosen by students for lack of goal achievement.

When participants reported what made it harder for them to achieve their goals, the most popular selection was "I had other obligations outside of academics and this goal was lower priority for me," (chosen 9 times by students) followed closely by "I was not very committed to the goal I set for the past week" (selected 8 times by students), and "I ran out of time to work on this goal" (selected 7 times). "Other" was selected twice with the student indicating illness as the reason. Thus, the most popular reasons were related to lack of time or more pressing commitments. The two options related to difficulty in studying the content or using the study strategy were not selected at all.

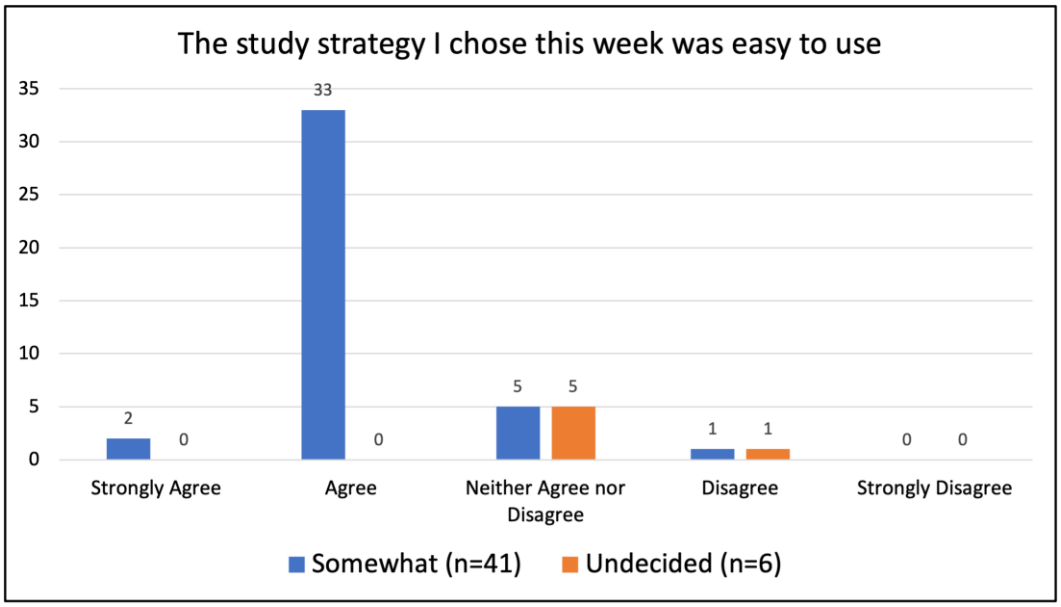
Those participants who answered "**Somewhat**. I was partly successful in achieving my goal for the week," and "**Undecided**. I am not sure if I achieved my goal for the week," were asked to answer four Likert questions to explore potential reasons for partly achieving their goal. The frequency of responses to each question is shown in Figures 4.14a-d.

a)



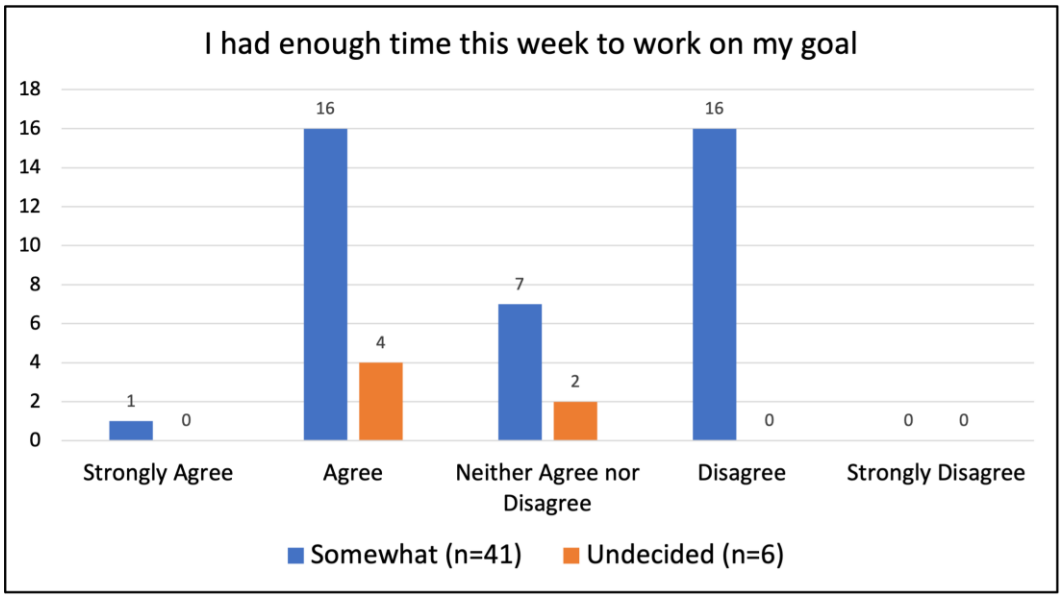
Most students who reported achieving their goals somewhat or were undecided, agreed that the content they were working on with their goals was easy to study/learn.

b)



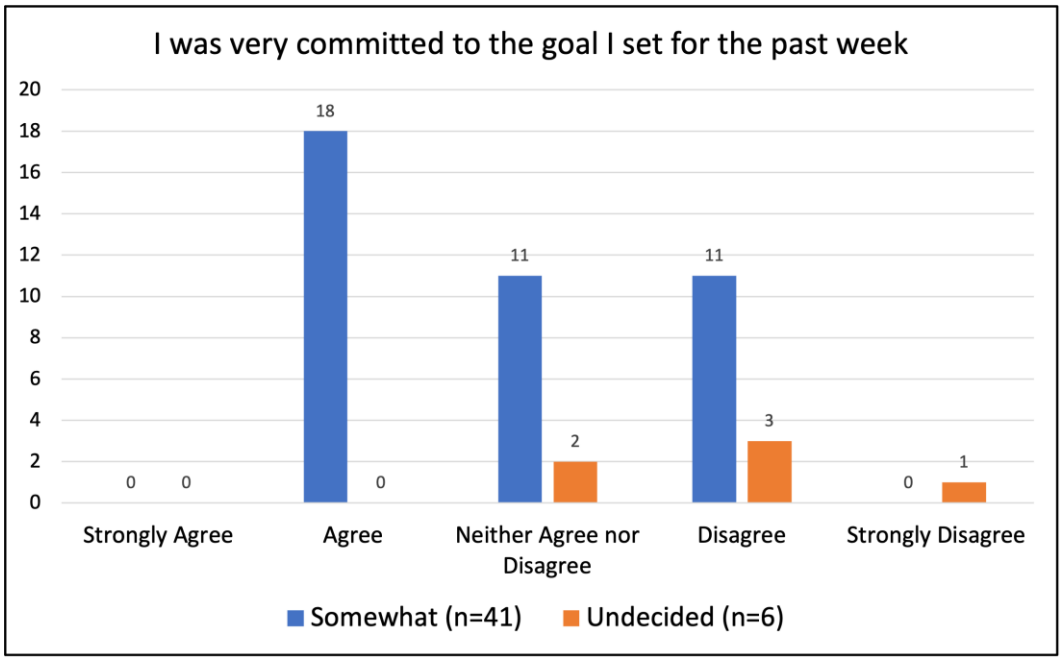
Most students who reported achieving their goals somewhat thought that the study strategy they chose was easy to use. Those who were undecided remained neutral regarding whether the study strategy they chose was easy to use.

c)



For those who somewhat achieved their goal, an equal number believed they either had enough time to work on their goal, or did not have enough time to work on their goal. Those who were undecided believed they had enough time to work on their goals or were neutral.

d)

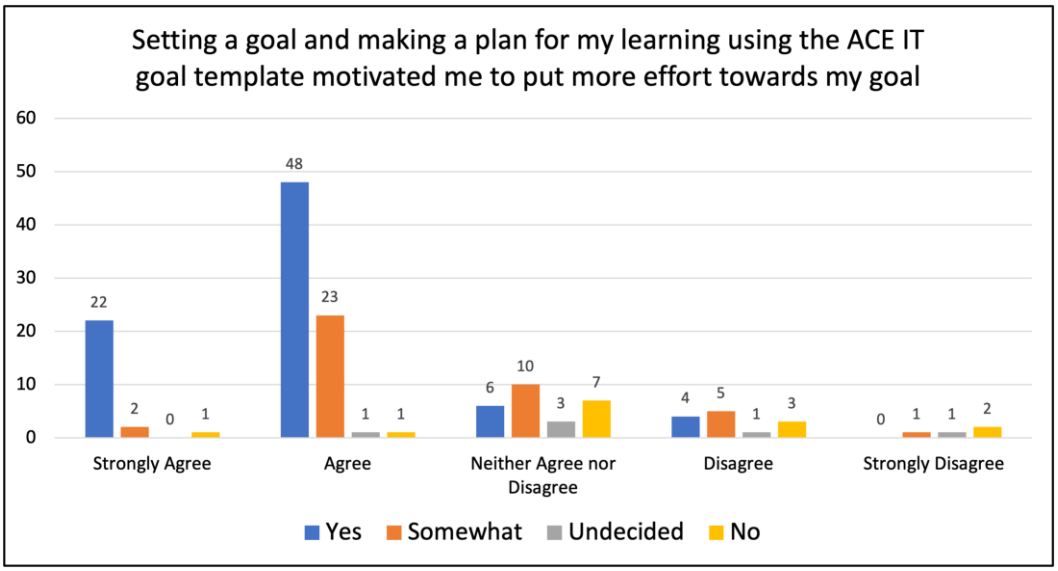


Most students who somewhat achieved their goal reported being committed to the goal they set. Many were also neutral or were not committed to the goal they set. Those who were undecided were mostly not committed to the goals they had set for themselves.

Figure 4.14. Responses by students who Somewhat achieved their goal or were Undecided about goal achievement

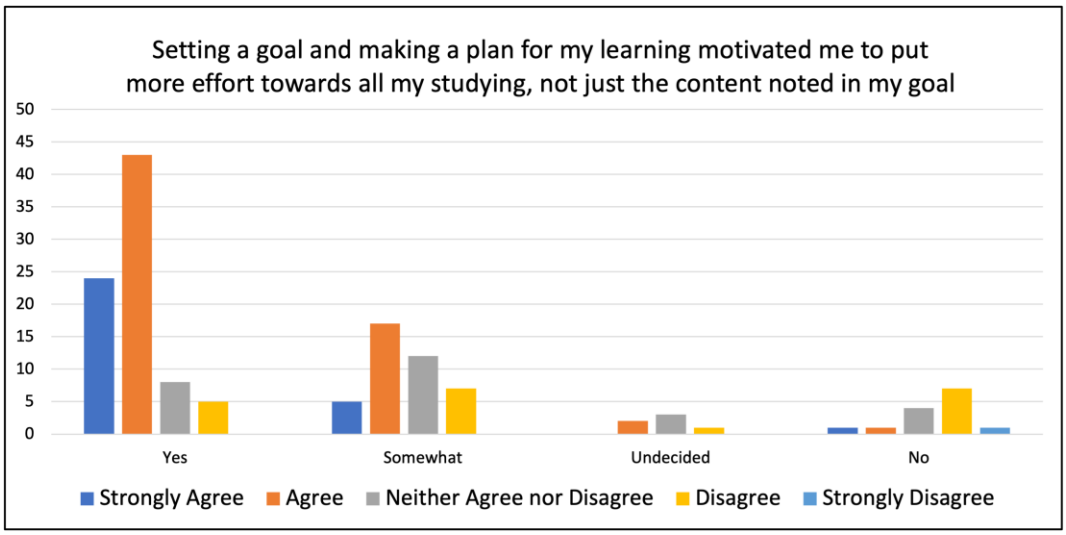
All participants in the Goal Setting group were then asked five questions about goal setting and studying. Their responses to three of the questions are summarized below (Figures 4.15a-c) based on their initial answer to "Did you achieve your goal from last week?" again aggregated over four weeks of goal setting and reflection:

a)



Those who did achieve their goals mainly agreed with the statement that using the ACE IT goal template motivated them in putting effort towards achieving their goal. Those who did not achieve their goals believed using the ACE IT goal template did not really motivate them to put more effort towards their goal, or they were neutral about the effect of the ACE IT goal template in motivating them.

b)



c)

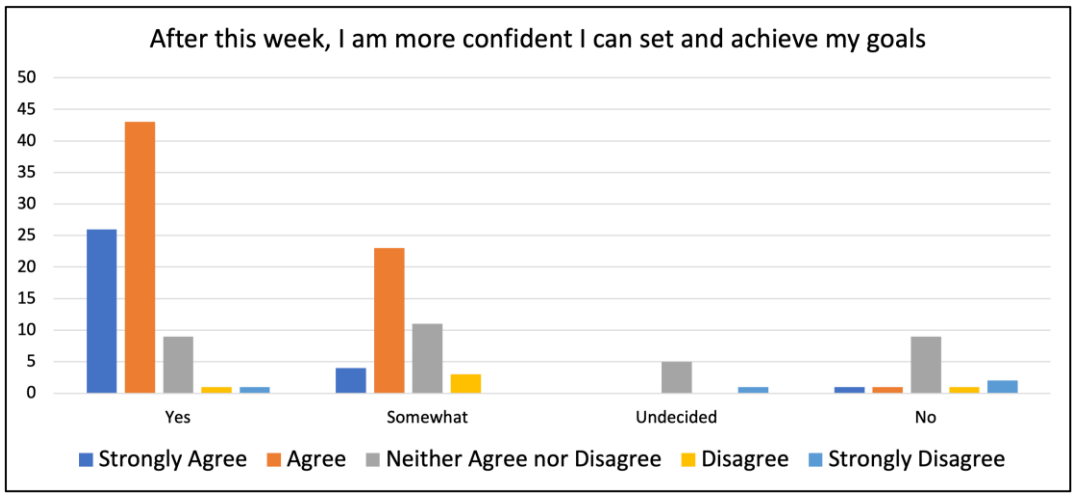


Figure 4.15. Goal Setting students' responses to Likert questions about their effort, motivation, and confidence in goal setting

Goal Setting students were then asked an open-ended question about their goal achievement, "Are there any factors that could have made it easier for you to achieve your goal this week?" Most of the students indicated n/a in response to this question, but for those who did include a response, I have summarized them below, grouped by how the students answered the initial goal achievement question:

Yes. I achieved my goal for the week (n = 81):

- More time would have made goal achievement easier (difficulty managing other exams, courses, work, etc.). (27 responses)
- If there were fewer distractions while studying. (4 responses)
- Illness made it difficult to achieve my goal. (4 responses)
- Instructional-related factors (e.g., prof. didn't post slides ahead of time). (3 responses)
- More motivation would have helped. (2 responses)
- Misc.: "I misinterpreted how long it would take to achieve my goal and completely understand each concept. I should have looked over what I was trying to learn more closely before setting a goal time for each study session." (1 response)

Somewhat. I was partly successful in achieving my goal for the week (n = 41):

- More time would have made goal achievement easier (difficulty managing midterms, other courses, work, etc.). (22 responses)
- More motivation would have helped. (7 responses)
- Better goal setting technique (e.g., "I should have spread out my studying instead of scheduling it all for one time," "setting a more rigorous schedule," "self-explanation would've been easier for me if I already had my notes written out," "trying to minimize highlighting things, focusing more on the most important informations."). (6 responses)
- If there were fewer distractions while studying. (2 responses)
- Instructional-related factors (e.g., prof. didn't post slides ahead of time). (1 response)

Undecided. I am not sure if I achieved my goal for the week (n = 6):

- More time/better time management. (3 responses)
- "Motivating myself more." (1 response)

No. I did not achieve my goal for the week (n = 14):

- Better time management/more time. (9 responses)
- More motivation. (2 responses)
- Illness made it difficult to achieve my goal. (1 response)

From the responses provided by students, the majority of factors students identified that would have made it easier for them to achieve their goals included: having more time, or scheduling/managing their time efficiently; more motivation and lack of distractions; and lack of illness all would've made goal achievement more likely. Some students (mostly those in the Somewhat – I partly achieved my goal group), mentioned that better goal setting technique would've made goal achievement easier. They wanted to do a better job with scheduling their studying and with using the study strategies provided. One student wrote, "I misinterpreted how long it would take to achieve my goal and completely understand each concept. I should have looked over what I was trying to learn more closely before setting a goal time for each study session." A few students mentioned instructional related factors as limiting their goal achievement, e.g., "having

the professor cover more of the readings in lecture," and "If there are more information from the class that are related to the terminology from the readings would be helpful."

Finally, Goal Setting students were asked, "Any other comments about the goal you set and your achievement in the past week?" There was a lot of variability in student responses to this prompt. All responses which relate to the research question (What affects students' successes and failures at goal attainment when using a goal template?) are categorized according to themes provided below.

Yes. I achieved my goal for the week (n = 81):

- The goal template was partly useful to me, e.g.:

"I normally take concise notes already but setting the goal in advance was good motivation towards completing my work."

"I think putting specific time for myself doesn't work well for me. its better for me to make a list of things that needs to be done that day so I could do them in any order or time I can and still be focused and get the job done."

"I am very particular about how I take notes so it was a little challenging to adjust and use a whole new concept, but I liked the change and challenge, and I found it was easy to organize my notes using the Cornell Note Taking System."

"Even though I have achieved the goal that I had set, I think I was a little stressed about the plan I had made. Not everything went through the plan because sometimes, things happen without a plan, then the scheduled plan would have to be all changed. However, I was able to review regularly and have a process in learning by studying whenever I had time."

"I should have incorporated more material to study for last week."

- The study strategy I chose worked for me, e.g.:

"I was proud to finish the flashcards and they definitely helped me to review and study, and I felt good about my midterm!"

"I found it really helpful to study using notes, and this is a technique that I will continue using throughout this course, too. Note taking makes it easier to absorb the information, as I write them into my notebook."

"I found it really helpful to use this technique and applying it to my studying. I also enjoyed this content, so I definitely think that was a contributing factor as well."

"It helped me a lot because I was able to test my knowledge after studying, and going through the cards repeatedly made it easier to remember the answers." [Flash cards]

"I think it was a good study technique because after creating the flash cards, I was able to carry them around everywhere and review the concepts I have went through and by repeating them over and over, it made me easier to understand"

"I am going to try to see my TA and prof more often, and for future classes!"

- The ACE IT template worked for me, e.g.:

"I really liked the strategy of setting a goal because it helped me want to achieve it instead of procrastinating."

"I liked that I had to include a time to complete my goal in, as this created a schedule and something I couldn't procrastinate on. It is easier to do something if you write it down so you won't forget."

"I would like to continue to use this method for other courses; it was very helpful."

"I will definitely continue to use and recommend the study strategy to conquer my other goals because it prevented me from getting overwhelmed and doing any last-minute cramming. Achieving my goal has given me the confidence to continue pushing myself and staying focused during the busy times at school."

"It was good I wrote down my goal because it held me accountable and I then remembered to do it and did not procrastinate."

"This goal helped me make progress towards procrastinating less"

"Accomplishing this goal has given me the confidence in setting more goals to achieve in the future"

"This goal was very useful because it helped me organize all my work and made it easier to understand the material."

"Setting a goal for each week truly seemed to help me study better. I also have figured out what a good goal is, compared to an unrealistic goal."

- I was distracted while trying to achieve my goal, e.g.:

"I found the study technique I had chosen didn't work as well as I thought it would. I made sure I stuck to it, and it was helpful once I did, but it was very easy to get distracted during breaks and extend the breaks to a longer period of time before going back to studying."

"It is hard to commit to a goal with many other tests and factors going on"

"I wish I had more time to work on this goal."

Somewhat. I was partly successful in achieving my goal for the week (n = 41):

- I was not completely motivated

"I feel that my biggest challenge in completing these goals is that I have far more challenging classes that demand more of my attention than my EDUC 222 class. It makes it easy for me to put this class aside since I don't feel as challenged as I do in my other classes, and I don't get as many assignments in this class."

"Setting goals through the program is helpful but I tent to find myself falling back into previous habits without constant reminders."

"I believe I need to take into account the possibility that schedules are bound to change"

"I think with a bit more of time and positivity this is actually a very easy way to keep up with weekly studying."

"I did study at first but as the week went on it became a more daunting task making me not want to go above and beyond"

"I would like to start my goals earlier in the week instead of later."

"I am very disappointed at my ability and I am surprised to how easily distracted I can be"

"I would like to practice being more consistent as I still find myself procrastinating."

"I find that I was just passively reading through the material as I wasn't able to concentrate."

"I forgot about the goal at the beginning and was focused on other academic tasks"

- The study strategy I chose somewhat worked for me, e.g.:

"I found the technique harder to use than I initially expected. I pride myself on my note-taking skills, but trying to narrow information down to 5-7 words proved to be difficult! But it was good to challenge myself with a new technique!"

"I found this study technique [self-questioning] more difficult to use, as I had mentioned as a worry in my goal setting. I think the fact that this week was the beginning of midterms put a lot of external stress on my studying and I viewed some of my other course work as more urgent or important, so I didn't invest as much time as I would have liked to ideally to really learn to use this technique properly."

"I was still able to study, but I did not have enough time to focus on the specific technique I wanted to learn last week."

"I am sure that I will be using this study strategy many times in the future, but I think going through the highlighted parts again and marking the very important parts out of highlighted parts would be an effective way as it minimizes times to review."

- The ACE IT template worked for me, e.g.:

"Very effective, helped me become an active learner."

- The goal template was partly useful to me, e.g.:

"My goals was to study Bronfenbrenner's ecobiological method of development using the compact notes method, however, when I created this goal, the content to study for chapter 3 was not yet posted and therefore I did not realize that Bronfenbrenner's theory was not a topic to be studied this week. Although I was not able to utilize the compact note method to study Bronfenbrenner in particular, I was still successful in using the method for my notes this week on the rest of the chapter content."

Undecided. I am not sure if I achieved my goal for the week (n = 6): There was just one comment in this group, "It helped me on some readings. However, we didn't have many readings this past week."

No. I did not achieve my goal for the week (n = 14): There were four comments in this group.

- Timing/Motivation issues

"I really want to keep myself organized and be committed to the goal. But, particularly this week, I have been preparing a midterm for my other course, therefore, I couldn't aced my goal last week. My apology!"

"Following the schedule was somewhat hard mostly because I didn't expect for my week to go the way it did."

"It was a lot harder to schedule a time to sit and read my book than I had anticipated."

"Made me realize that I have more work to do on myself in order to work better academically"

Summarizing all the reports by students, factors that affected students' **success** at goal attainment when using the ACE IT goal template included:

- The study strategies were effective at helping students learn and study the course content.
- Creating a goal provided motivation to achieve and avoid procrastination or last-minute cramming.
- Goal setting helped organize what material should be studied each week.

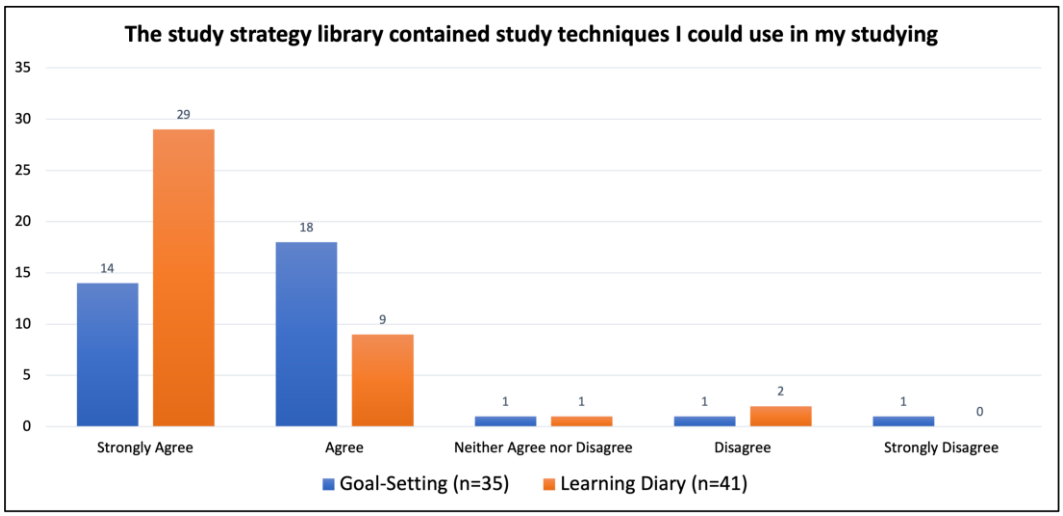
Factors reported to affect students' **failure** at complete goal attainment when using the ACE IT goal template included:

- At times it was difficult to adjust to a new way of studying (using the ACE IT template) and use the provided study strategies.
- Specifying a specific time of day/week to work on a goal, when normally the student would just work on the task as time permitted.
- It was hard to commit to the ACE IT goal due to other courses and exams at the same time.
- Consistency and staying motivated affected students' goal achievement.

4.4. Research Question 4: How do students use and perceive a library of study strategies when creating weekly study plans?

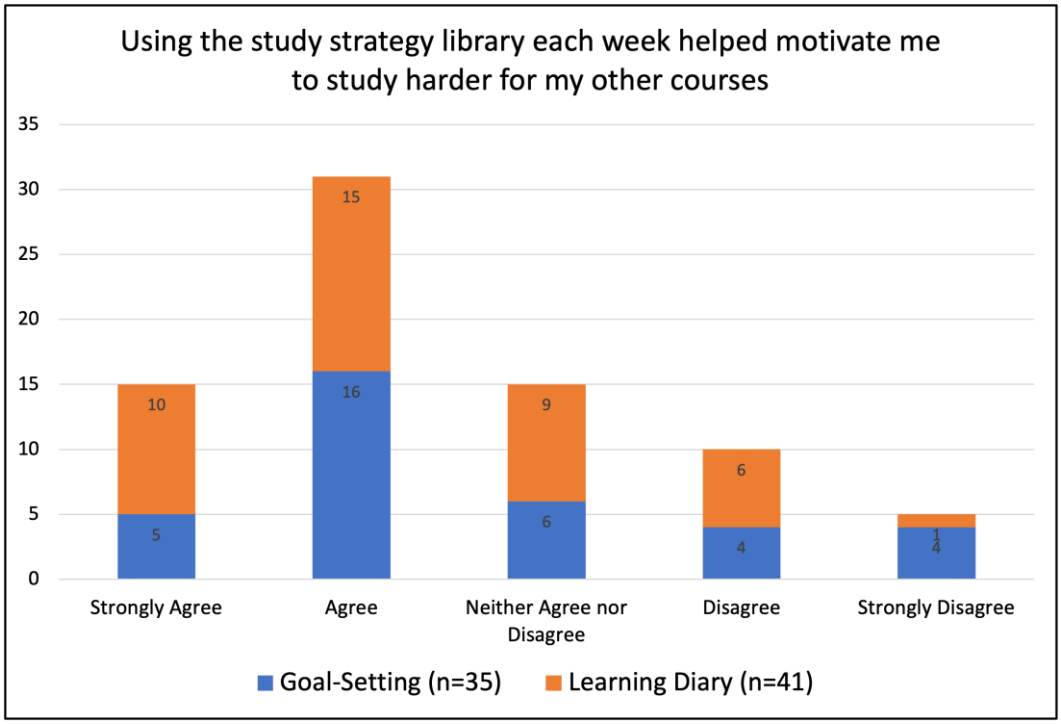
Participants in both groups used the Study Strategy Library. Their responses to questions from the *Perceptions of Goal Setting Questionnaire* and the *Perceptions of Learning Diary Questionnaire* pertaining to the Study Strategy Library (SSL) are displayed in the figures below (Fig. 4.16a-c).

a)



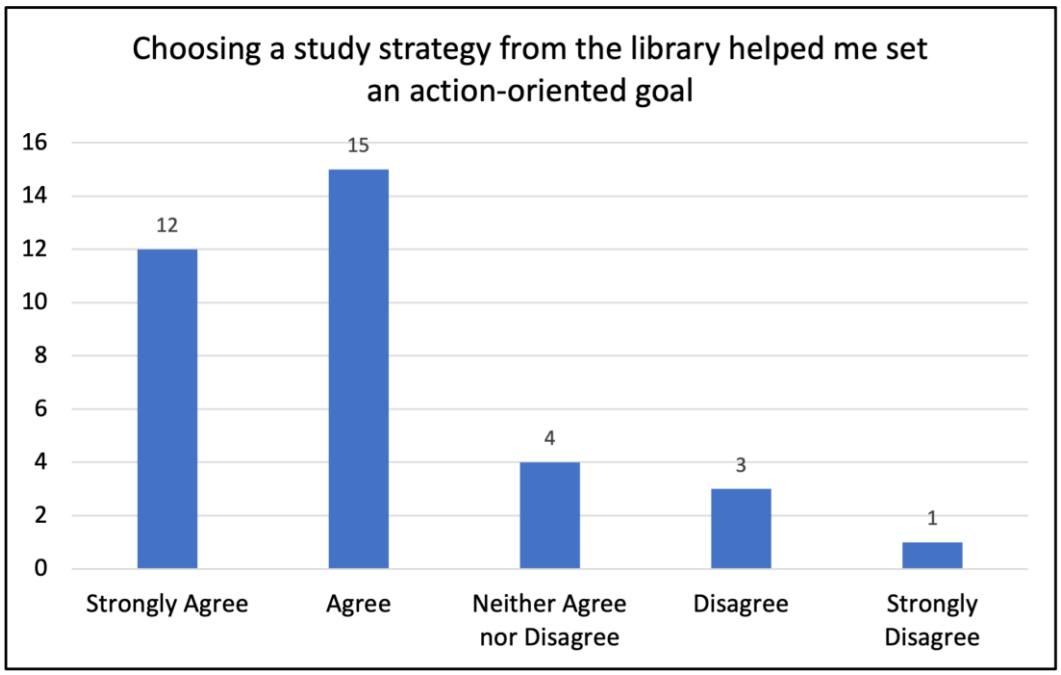
Overall there was a positive reaction to the study techniques provided in the SSL, in both the Goal Setting and Learning Diary groups.

b)



The purpose of this question was to investigate potential carry-over effects from using the study strategies from the SSL. Did using these strategies help motivate students when studying for their other courses? Overall, the students seemed to report some carry-over of motivation, but the responses were not overwhelmingly positive as was the case with the previous question.

c)



Only the Goal Setting group answered this additional question. In goal setting, it is important to have an actionable goal so students know what specific action to take and will be able to evaluate goal achievement. The SSL was presented to students to encourage creating actionable goals. Thus, I wanted to determine whether students found using a strategy from the SSL helpful in setting their goal.

Figure 4.16. Goal Setting and Learning Diary students' perceptions of the Study Strategy Library (SSL)

All participants were then asked: *Would you continue to use the Study Strategy Library in your studying? Please supply a brief explanation.* Students responded Yes, No, or explained that they would use some of the strategies (Fig. 4.17).

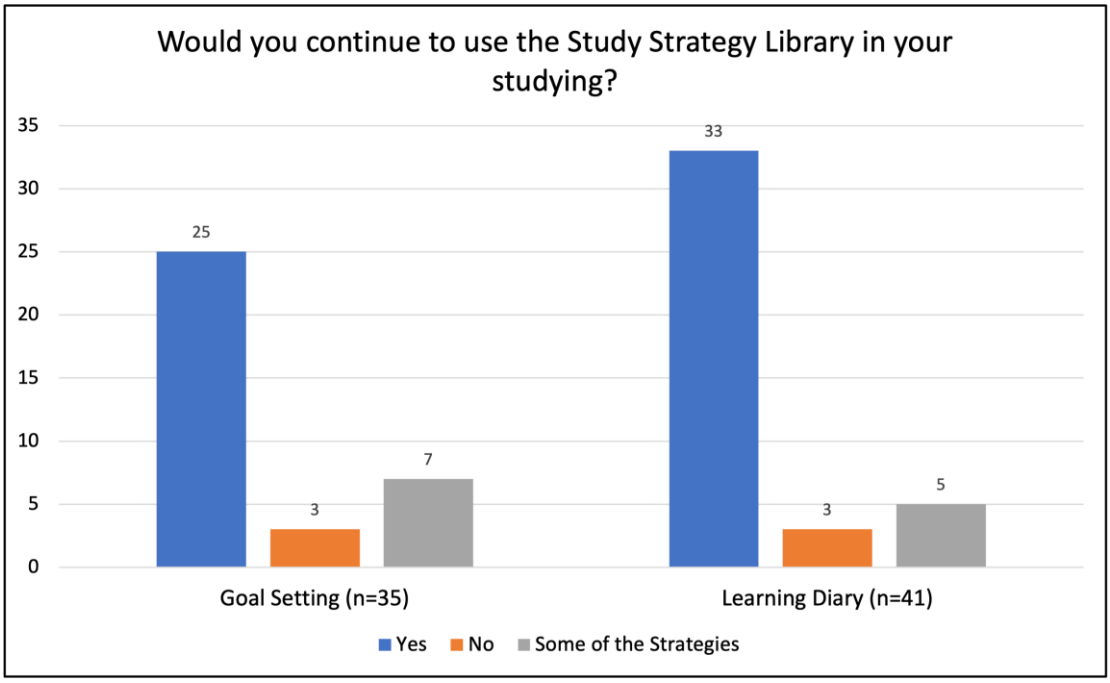


Figure 4.17. Student responses to "Would you continue to use the Study Strategy Library in your studying" by group.

Goal Setting Group:

Those who responded *Yes* explained that they were interested in further exploring some of the study techniques they didn't know about before, could use different study strategies for different content and situations, and that the SSL helps them avoid procrastinating and motivates them in studying course content. Those who responded that they would be open to using *some of the strategies* in the SSL explained that some of the strategies did not work for them, some seemed to be particularly beneficial so they would continue to use those, and they would like to focus on the ones they have already learned and continue striving to use those effectively. Those who responded *No* wrote that they have their own preferred study methods.

Learning Diary Group:

Those who responded *Yes* explained that the SSL helped them realize how they could study effectively; they were interested in further exploring some of the study techniques they hadn't tried before; they would use it if they felt stuck while studying or were

studying for a new type of exam. Those who responded that they would be open to using *some of the strategies* in the SSL explained that they would continue to use certain techniques they have found effective. Those who said they wouldn't use the SSL wrote that they are now familiar with all the study strategies, or have their own, and have specific favourites that they will continue using without needing the SSL.

Overall, both groups had very positive reactions towards the Study Strategy Library, e.g., "Yes. The study strategy library contains so many helpful strategies and I appreciate how it tells me why each one is effective. I will continue to use it in each of my courses…" "I would try to continue using the Study Strategy Library because it has become incredibly beneficial and helpful when it comes to studying. It provided new techniques to experiment with and see which study strategy worked out the best for me."

Frequency of Use – Study Strategy Library

A count was done of each Study Strategy selected by students to use when creating their weekly ACE IT goal or learning diary, across the four weeks. Figure 4.18 displays the frequency of use of each study technique by group. There were six situations in which students selected two strategies rather than one, e.g., "Highlighting and Summarization" or "Creating Compact Notes and Summarization." In these cases, both strategies were counted for the participant.

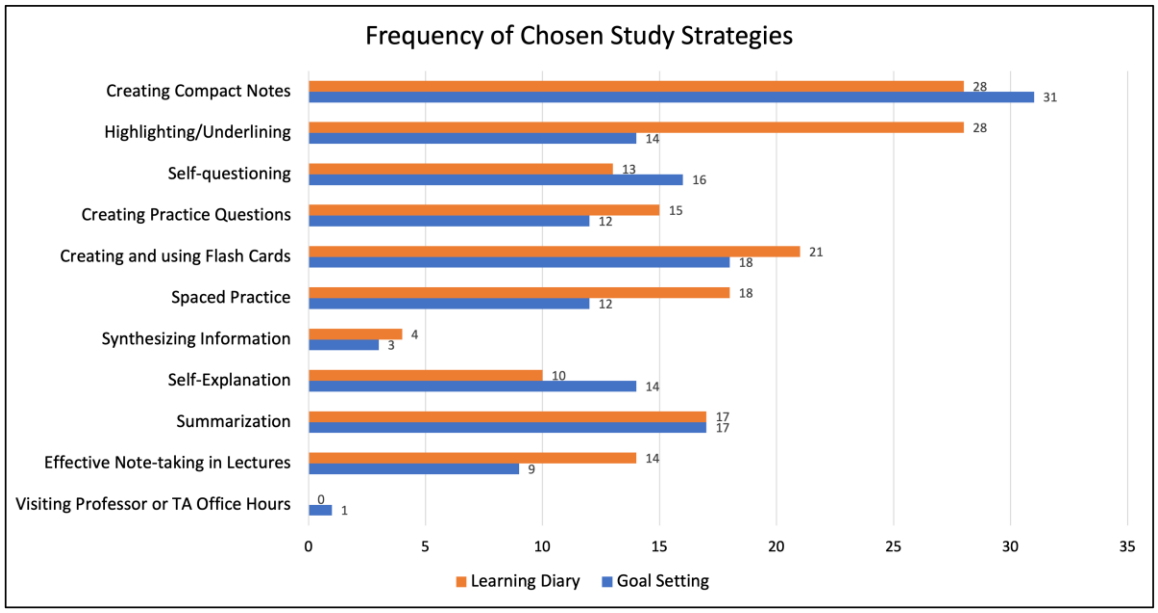


Figure 4.18. The frequency of use of each study strategy by group.

In the Goal Setting group, the two most chosen study strategies were *Creating Compact Notes* and *Highlighting/Underlining*. In the Learning Diary group, the two most chosen study strategies were *Creating Compact Notes* and *Creating and using Flash Cards*. The two least used strategies across both groups were *Synthesizing Information* and *Visiting Professor or TA Office Hours*.

Confidence Ratings – Study Strategy Library

Participants were asked to rate their confidence in each study technique at the beginning and end of the intervention "How confident are you in your ability to use this study technique?" The purpose of this analysis is to see if there is a statistically detectable difference between students' initial confidence ratings and their ratings after using the Study Strategy Library. Students rated their confidence on a slider containing five options, from 'Very Confident' (5) to 'Not at all confident' (1).

After pooling students across intervention groups, a paired samples *t*-test (using an alpha level of .05) compared confidence ratings in each study technique before the intervention and at the end of the study. There was a statistically detectable increase in students' confidence ratings in 8 of the 11 study techniques in the Study Strategy Library.

Creating Compact Notes: There was a statistically detectable increase in confidence ratings about the *Creating Compact Notes* study technique before creating ACE IT goals or writing in the learning diary ($M = 3.65$, $SD = 0.99$) compared to after participating in four weeks of study planning ($M = 3.92$, $SD = 0.95$), $t(73) = 2.24$, $p = .028$.

Highlighting/Underlining: There was a statistically detectable increase in confidence ratings about the *Highlighting/Underlining* study technique before creating ACE IT goals or writing in the learning diary ($M = 3.72$, $SD = 1.00$) compared to after participating in four weeks of study planning ($M = 4.00$, $SD = 1.14$), $t(73) = 2.74$, $p = .008$.

Self-questioning: There was a statistically detectable increase in confidence ratings about the *Self-questioning* study technique before creating ACE IT goals or writing in the learning diary ($M = 3.12$, $SD = 0.99$) compared to after participating in four weeks of study planning ($M = 3.51$, $SD = 1.00$), $t(73) = 2.89$, $p = .005$.

Creating Practice Questions: There was a statistically detectable increase in confidence ratings about the *Creating Practice Questions* study technique before creating ACE IT goals or writing in the learning diary ($M = 3.15$, $SD = 1.08$) compared to after participating in four weeks of study planning ($M = 3.53$, $SD = 0.89$), $t(73) = 2.98$, $p = .004$.

Creating and using Flash Cards: There was a statistically detectable increase in confidence ratings about the *Creating and using Flash Cards* study technique before creating ACE IT goals or writing in the learning diary ($M = 3.72$, $SD = 1.16$) compared to after participating in four weeks of study planning ($M = 4.00$, $SD = 1.05$), $t(73) = 2.67$, $p = .009$.

Spaced Practice: There was a statistically detectable increase in confidence ratings about the *Spaced Practice* study technique before creating ACE IT goals or writing in the learning diary ($M = 3.05$, $SD = 1.18$) compared to after participating in four weeks of study planning ($M = 3.55$, $SD = 1.04$), $t(73) = 3.95$, $p < .001$.

Synthesizing Information: There was a statistically detectable increase in confidence ratings about the *Synthesizing Information* study technique before creating ACE IT goals

or writing in the learning diary (M = 3.00, SD = 1.03) compared to after participating in four weeks of study planning (M = 3.51, SD = 0.89), $t(72) = 3.96$, $p < .001$.

Self-Explanation: There was a statistically detectable increase in confidence ratings about the *Self-Explanation* study technique before creating ACE IT goals or writing in the learning diary (M = 3.30, SD = 0.92) compared to after participating in four weeks of study planning (M = 3.67, SD = 0.88), $t(72) = 2.78$, $p = .007$.

Thus, for the above 8 study techniques, the results support the hypothesis that participating in the intervention and using the Study Strategy Library for four weeks helped increase students' confidence in using these study techniques.

In 3 of the 11 study techniques in the Study Strategy Library, there was not a statistically detectable increase in students' confidence ratings:

Summarization: There was not a statistically detectable increase in confidence ratings for the *Summarization* study technique before creating ACE IT goals or writing in the learning diary (M = 3.64, SD = 0.87) compared to after participating in four weeks of study planning (M = 3.78, SD = 0.85), $t(73) = 1.31$, p =.194.

Effective Note-taking in Lectures: There was not a statistically detectable increase in confidence ratings for the *Effective Note-taking in Lectures* study technique before creating ACE IT goals or writing in the learning diary (M = 3.77, SD = 1.04) compared to after participating in four weeks of study planning (M = 3.99, SD = 0.94), $t(73) = 1.45$, p = .138.

Visiting Professor or TA Office Hours: There was no increase in confidence ratings for the *Visiting Professor or TA Office Hours* study technique before creating ACE IT goals or writing in the learning diary (M = 2.84, SD = 1.03) compared to after participating in four weeks of study planning (M = 3.00, SD = 1.15), $t(73) = 1.27$, p = .208.

Thus, for these three study techniques, the null hypothesis is not rejected. The intervention could not be interpreted as affecting students' confidence in using these study strategies.

It is interesting to note that "Visiting Professor or TA Office Hours" had the lowest confidence ratings, both before and after the intervention.

To compare confidence ratings between the Learning Diary and Goal Setting groups, overall ratings were calculated for each student by summing their confidence ratings across strategies to develop an overall "SSL library" confidence level at Week 1 and at Week 5. Individual ratings were: 1=Not at all confident; 2 = Not confident; 3= Somewhat Confident; 4 = Confident; 5= Very Confident, so higher scores indicate more confidence in the study strategies. The average total confidence rating at Week 1 for the LD group was $M = 36.7$, $SD = 5.6$, and at Week 5 the average total confidence score was $M = 41.4$, $SD = 5.7$. For the GS group, the average total confidence rating at Week 1 was $M = 37.2$, $SD = 5.4$, and at Week 5 the average total confidence score was $M = 39.8$, $SD = 5.3$.

A multivariate profile analysis was considered to compare students' confidence ratings of each study strategy between the Goal Setting and Learning Diary groups, but the approach was eventually abandoned because the ratio of variables to participants was not conducive to a multivariate analysis and statistical power would be compromised. Also, students did not necessarily choose each of the eleven study strategies throughout the four weeks of the intervention. Because of this, a multivariate analysis across all the strategies, some of which may have not been chosen, and which were chosen at different rates across each participant, make multivariate analysis inappropriate.

The average of each group's ratings profile across strategies in Weeks 1 and 5 is presented in Fig. 4.19.

The groups, Goal Setting (GS) and Learning Diary (LD) were assessed using their total Study Strategy Library confidence scores before participating in the intervention (Week 1) and after the intervention was complete (Week 5). A repeated measures ANOVA was calculated with group as the independent variable and pre- and post-intervention Study Strategy Library (SSL) confidence ratings as the within-subjects outcome variable.

The main effects of group was $F(1, 74) = .098$, $p = 0.756$, $\eta^2 = .00132$. Study Strategy Library confidence ratings comparing pre-intervention to post-intervention generated $F(1, 74) = 22.155$, $p < .001$, $\eta^2 = .221$. Thus, there was not a statistically detectably different group effect, however there was a statistically detectable difference in overall combined scores between the pre-intervention study strategy confidence ratings and the post-intervention study strategy confidence ratings.

There was a statistically detectable Template X Time interaction, $F(1, 74) = 4.086$, $p = .047$, $\eta^2 = .0408$. Tests of simple effects using Bonferroni-corrected *t* tests revealed that students in both template interventions had comparable confidence ratings when initially scoring themselves on the study strategies, $F(1, 74) = 1.655$, $p = .202$. There was no statistically detectable difference between the two group's ratings after the intervention, $F(1, 74) = 1.561$, $p = .215$.

Study strategy ratings for the LD group statistically detectably increased from pre-intervention ($M = 34.81$, $SD = 1.25$) to post-intervention ($M = 41.39$, $SD = .86$), $F(1, 74) = 24.575$, $p < .001$. There was no statistically detectable change in pre- ($M = 37.17$, $SD = 1.35$), and post scores ($M = 39.8$, $SD = .94$) for the GS group, $F(1, 74) = 3.342$, $p = .072$.

The GS and LD groups had similar pre-intervention confidence ratings on study strategies in the SSL. After a four-week intervention, confidence ratings in the GS group stayed about the same, but ratings in the LD group statistically detectably increased.

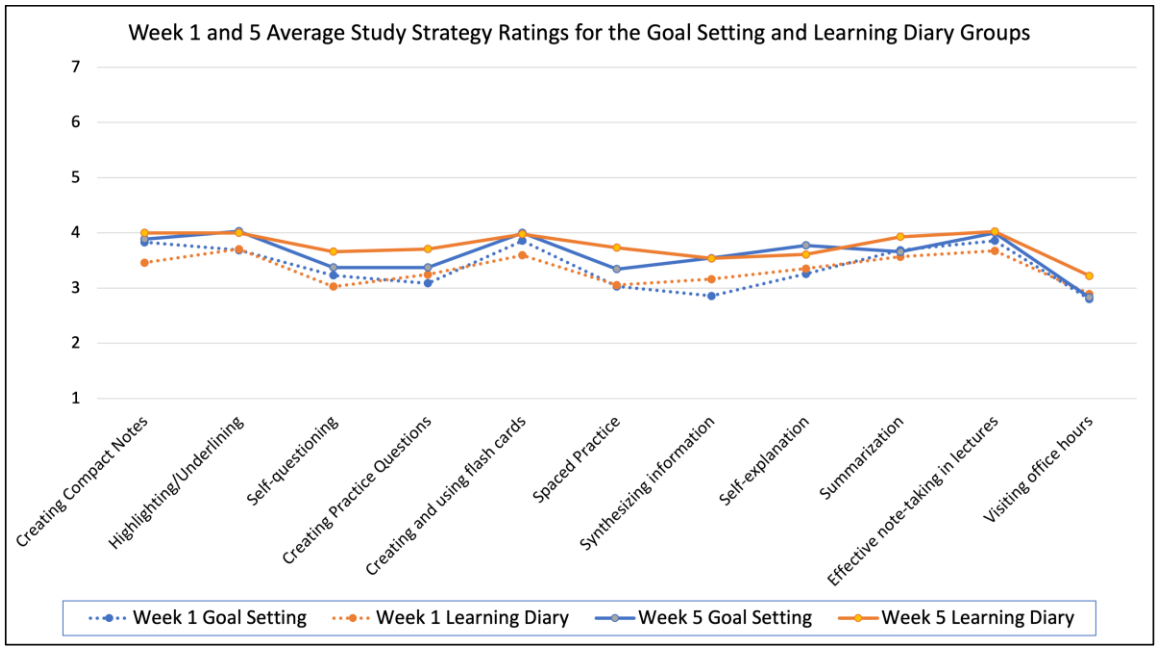


Figure 4.19. Each group's study strategy confidence ratings profile in Weeks 1 and 5

4.5. Research Question 5: When students have access to a library of study strategies, is there a difference in academic achievement between those who create structured goals and those who keep a learning diary?

Students' final grades in the Education course they had indicated for their goal setting/learning diary were converted from letter grades to their numerical equivalent (e.g., A+ = 4.33, A = 4.0, etc.). Two independent groups *t*-tests were performed, one for Fall 2019 data and one for Spring 2020 data.

Fall 2019 (n = 25):

Participants either set goals using a structured ACE IT goal setting template (GS), or created unguided learning plans (LD), and both groups worked to achieve their plans over a 4-week period. Students' final grades were collected to investigate differences in achievement between the GS and LD groups. Inspection of Q-Q plots revealed that students' grades were normally distributed for both groups and that there was homogeneity of variance as assessed by Levene's Test of Equality of Variances. The 12 participants who set goals, GS ($M = 3.42$, $SD = 0.47$) and the 13 participants who wrote

learning plans, LD (M = 3.74, SD = 0.53) did not show a statistically detectable difference in final grade, $t(23) = .378$, $p = .120$.

Spring 2020 (n = 49):

Three students were removed from analysis because they chose Pass/Fail grading due to the switch to remote instruction.

Participants either set goals using a structured ACE IT goal setting template (GS), or created unguided learning plans (LD), and both groups worked to achieve their plans over a 4-week period. Inspection of Q-Q plots revealed that students' grades were normally distributed for the GS group but not the LD group. However, because the t-test is robust to mild violations of normality, it was calculated and might be interpreted cautiously. There was homogeneity of variance as assessed by Levene's Test of Equality of Variances. The 24 participants who set goals, GS (M = 3.25, SD = 0.51) and the 25 participants who wrote learning plans, LD (M = 3.57, SD = 0.39) showed a statistically detectable difference in final grade performance, $t(47) = 2.48$, $p = .017$ favoring the LD group.

4.6. Research Question 6: After a four-week intervention, is there a difference in students' reports about self-regulated learning (SRL) skills between the Goal Setting group and the Learning Diary group? Does group participation affect change in reported SRL skills from initial ratings?

Students twice completed the Self-Regulated Learning Skills Questionnaire (Appendix I), adapted from the Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich, et al., 1991) – once at the beginning of the study before engaging in any goal or plan creation, and once at the end of the intervention. The items chosen for this research are related to self-regulated learning, goal setting, and the specific strategies presented to students in the Study Strategy Library.

Each week, Goal Setting (GS) students were tasked to write a goal as guided by specific goal prompts in the ACE IT template. Learning Diary (LD) students were asked to write generally about their studying plan.

The data collected before and after the intervention allow testing for three effects: treatment (i.e., GS vs. LD groups), time (pre-intervention vs. after four weeks of participation), and the interaction of treatment (group) by time (pre-post SRL ratings).

An average SRL score was calculated for each student as the sum of all item ratings divided by number of items for students who responded to the questionnaire in Week 1 and Week 5. Items could be scored from 1 to 7. Items that required reverse coding were converted so higher numbers reflect positive use of a study strategy. A repeated measures ANOVA was calculated with group as the independent variable and pre- and post-intervention SRL scores as the within-subjects outcome variable.

The main effects of group was $F(1, 72) = 3.118$, $p = 0.082$, $\eta^2 = .0415$. SRL ratings comparing pre-questionnaire to the post-questionnaire generated $F(1, 72) = 1.619$, $p = .207$, $\eta^2 = .0209$. Neither effect was statistically detectable using the conventional threshold of $p \leq .05$. There was not a statistically detectable difference in overall combined scores between the GS and LD groups.

I judge there was a statistically detectable Template X Time interaction, $F(1, 72) = 3.796$, $p = .055$, $\eta^2 = .049$ using a threshold just slightly beyond conventions. The interaction is presented in Figure 4.20. Tests of simple effects using Bonferroni-corrected *t* tests revealed that students in both template interventions had comparable SRL ratings on the initial questionnaire but students in the GS ($M = 4.41$, $SD = .11$) and LD ($M = 4.79$, $SD = .10$) groups had statistically detectably different SRL ratings in the post-intervention questionnaire $F(1, 72) = 6.912$, $p = .010$.

Additionally, SRL ratings for the GS group statistically detectably declined from pre-intervention ($M = 4.63$, $SD = .13$) to post-intervention ($M = 4.41$, $SD = .11$), $F(1, 72) = 4.797$, $p = .032$. There was no statistically detectable change in pre-post scores for the LD group, $F(1, 72) = .249$, $p = .62$. Both the GS and LD groups had comparable pre-

intervention ratings on items in the SRL questionnaire. After a four-week intervention, ratings in the LD group stayed about the same, but ratings in the GS group statistically detectably decreased (Figure 4.20).

Thus, participation in the Goal Setting group led to a reported decrease in the use of SRL skills. Participation in the Learning Diary group had no effect on self-regulated learning skills.

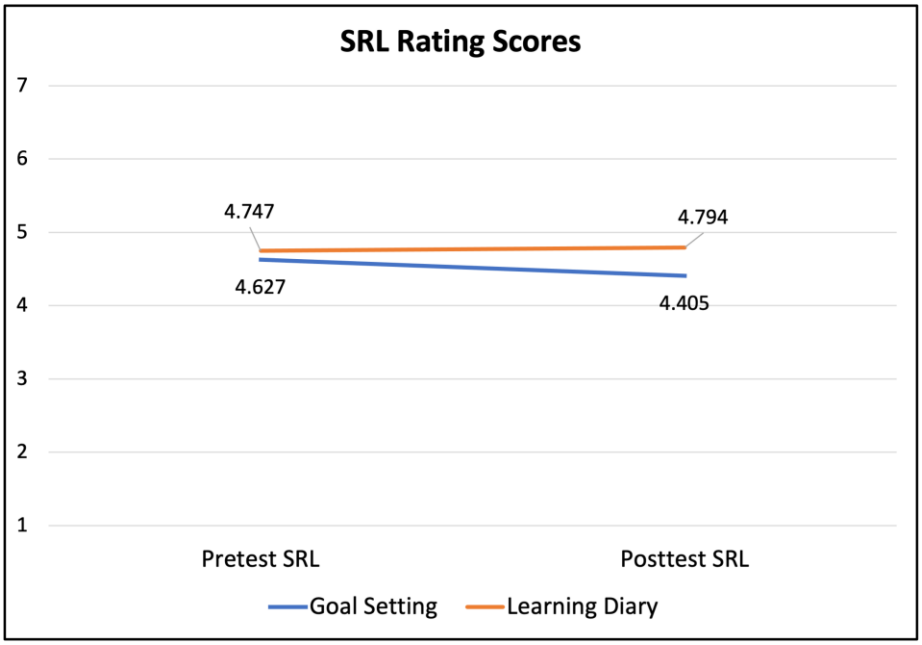


Figure 4.20. Pre- and Post-intervention student SRL confidence ratings, by group.

Revising subscales to be more sensitive to study interventions

To explore whether SRL items might vary in their ability to detect effects of the interventions, I conducted a close reading of the items on the SRL questionnaire to divide them into three categories: those most relevant to the Goal Setting group, those relevant to both the Goal Setting and Learning Diary groups, and those not relevant to either group. These groupings best categorized the items from the SRL questionnaire.

An example of an item from the SRL questionnaire I judged should be included in a new Goal Setting subscale is, “I often find that I don't spend very much time on this course because of other activities.” This as relevant to goal setting in this intervention

because the ACE IT goal template was designed to prompt students to organize study time by identifying obstacles to studying and specifying time to study/work on course content despite having other activities and commitments.

Each of the 46 items from the SRL questionnaire was categorized to identify it as related to one and only one of: the Goal Setting template (code 1), the Study Strategies from the Study Strategy Library (code 2), or, neither the GS template nor SSL (code 3). Proposed codes were discussed with my thesis supervisor and agreement was reached. All items from the Rehearsal, Elaboration, and Organization subscales of the SRL questionnaire were assigned code 2. Most items from the Critical Thinking and Metacognitive Self-Regulated Learning subscales were assigned code 2, although a few were assigned code 3 as they were not related to the SSL or GS template. Most items from the Time and Study Environment subscale and all of Effort Regulation subscale were assigned code 1 except a few assigned code 3.

Reliability of these new subscales was measured by Cronbach's alpha computed using SPSS statistical software. GS and LD groups were combined for pretest responses because it is assumed there is no difference between students in the groups before they experienced interventions. Subscale 1 related to the Goal Setting template consisted of 9 items ($\alpha = .822$), Subscale 2 related to Study Strategies from the SSL) consisted of 27 items ($\alpha = .860$), and Subscale 3 items not related to the GS template or SSL consisted of 7 items ($\alpha = .488$). Subscales 1 and 2 were considered reliable (George & Mallery, 2003). Subscale 3's poor reliability was expected as it was composed of "left over" items that don't have a single underlying characteristic.

Following the intervention, posttest reliability scores were calculated within each group. Within the GS group, Cronbach alpha for subscale 1 items related to the Goal Setting template was $\alpha = .418$, for subscale 2 items related to the Study Strategies from the SSL was $\alpha = .845$, and for subscale 3 items not related to the GS template or SSL was $\alpha = .476$. Within the LD group Cronbach alpha for subscale 1 items related to the Goal Setting template was $\alpha = .322$, for subscale 2 items related to the Study Strategies from

the SSL was α = .800, and for subscale 3 items not related to the GS template or SSL α = .579.

It is unclear what is causing the reliability of Subscale 1 items related to the Goal Setting template) to decrease substantially from pretest to posttest. As mentioned in Chapter 3, the original subscales are from the MSLQ, which has robust scale reliability (Pintrich et al., 1993). Re-categorizing items and experience with the goal setting and learning diary intervention affected internal consistency.

The following items from the selected MSLQ subscales were placed in Subscale 1 items related to the Goal Setting template:

- When I study for this class, I set goals for myself in order to direct my activities in each study period.
- I make good use of my study time for this course.
- I find it hard to stick to a study schedule.
- I make sure I keep up with the weekly readings and assignments for this course.
- I often find that I don't spend very much time on this course because of other activities.
- I often feel so lazy or bored when I study for this class that I quit before I finish what I planned to do.
- I work hard to do well in this class even if I don't like what we are doing.
- When course work is difficult, I give up or only study the easy parts.
- Even when course materials are dull and uninteresting, I manage to keep working until I finish.

A repeated measures ANOVA was calculated for each constructed subscale to investigate effects of the GS or LD group on students SRL ratings.

Subscale 1 - items related to the Goal Setting template.

Neither the main effect of type of template, $F(1, 72) = 1.374$, $p = 0.245$, $\eta^2 = .019$ or SRL Subscale 1 ratings from the pre-questionnaire to the post-questionnaire, $F(1, 72) = .003$, $p = .958$, $\eta^2 = .000$ were statistically detectable. Nor was there a statistically

detectable Template x Time interaction, $F(1, 72) = 2.679$, $p = .106$, $\eta^2 = .036$. The interaction is presented in Figure 4.21a.

Despite not observing statistically detectable effects at conventional *p*-levels, I used Bonferroni corrected *t*-tests to explore specific contrasts for statistically detectable simple effects because an omnibus test sometimes fails to signal those effects (Chen et al., 2018).

Tests of simple effects using Bonferroni-corrected *t*-tests revealed that students in both template interventions had comparable Subscale 1 ratings on the initial questionnaire, but in the post-intervention questionnaire, the students in the GS ($M = 4.64$, $SD = .11$) and LD ($M = 5.03$, $SD = .10$) groups had statistically detectably different Subscale 1 ratings $F(1, 72) = 6.585$, $p = .012$. Students in the LD group rated their SRL skills from Subscale 1 items related to the GS template higher than students in the GS group.

Subscale 2 - items related to the Study Strategies from the Study Strategy Library.

The main effects of type of template, $F(1, 72) = 2.989$, $p = 0.088$, $\eta^2 = .040$ was not statistically detectable using conventional standards. SRL The difference in Subscale 2 ratings from the pre-questionnaire to the post-questionnaire was statistically detectable, $F(1, 72) = 4.098$, $p < .047$, $\eta^2 = .053$. The Template x Time interaction, $F(1, 72) = 1.615$, $p = .208$, $\eta^2 = .021$ was not statistically detectable. The interaction is presented in Figure 4.21b.

Tests of simple effects using Bonferroni-corrected *t*-tests revealed that students in both interventions had comparable Subscale 2 ratings on the initial questionnaire, but the students in the GS ($M = 4.31$, $SD = .12$) and LD ($M = 4.66$, $SD = .11$) groups had statistically detectably different Subscale 2 ratings in the post-intervention questionnaire $F(1, 72) = 4.879$, $p < .05$. Both groups ratings decreased from pre- to post- ratings.

Subscale 3 – items not related to the GS template or Study Strategy Library.

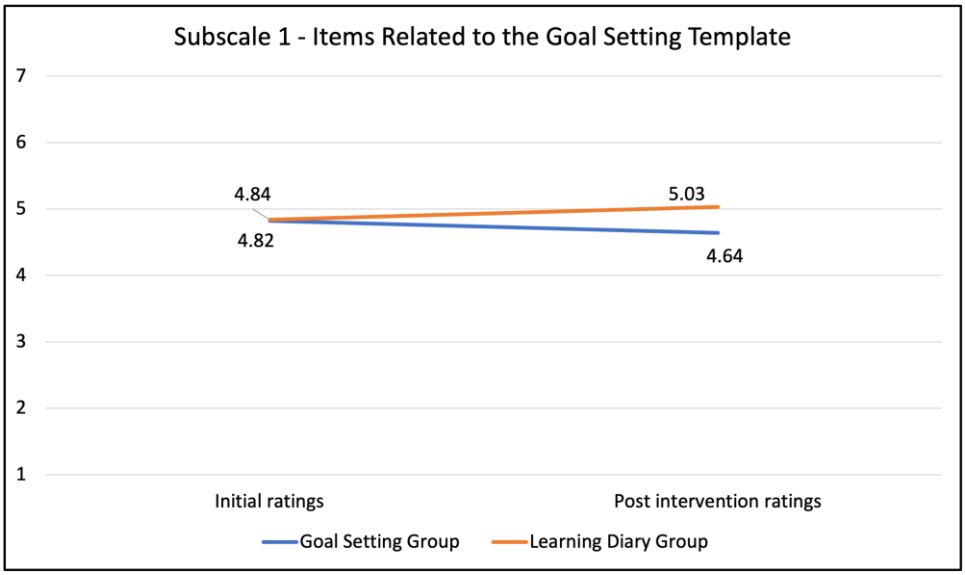
Despite low reliability in this scale, to explore for findings as were observed in the previous two subscales, I conducted the same analysis as above.

The main effects of type of template, $F(1, 72) = 2.791$, $p = 0.099$, $\eta^2 = .037$ and SRL Subscale 3 ratings from the pre-questionnaire to the post-questionnaire, $F(1, 72) = .001$, $p = .975$, $\eta^2 = .000$ were not statistically detectable. There was a statistically detectable Template x Time interaction, $F(1, 72) = 4.020$, $p < 0.05$, $\eta^2 = .053$. The interaction is presented in Figure 4.21c.

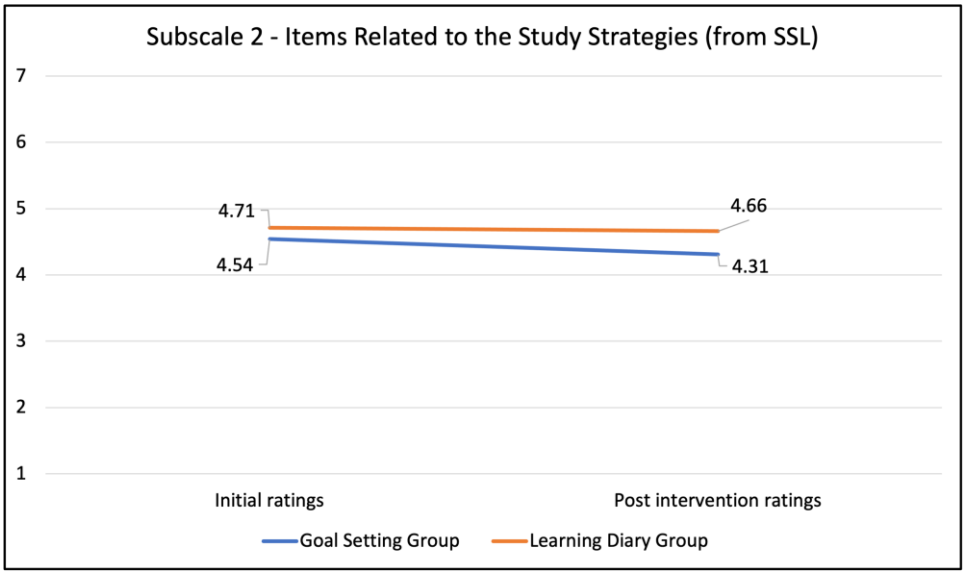
Tests of simple effects using Bonferroni-corrected *t*-tests revealed that students in both template interventions had comparable Subscale 3 ratings on the initial questionnaire but, on the post-intervention questionnaire, the students in the GS ($M = 4.48$, $SD = .13$) and LD ($M = 4.96$, $SD = .12$) groups had statistically detectably different Subscale 3 ratings $F(1, 72) = 7.134$, $p = .009$. Students in the LD group rated their SRL skills from Subscale 3 higher than students in the GS group. It is noteworthy that the reliability of the subscale in post-SRL ratings was low. Thus it is difficult to draw inferences from these results, as the observed variance could be measurement error and due to chance.

Figures 4.21a-c illustrate the difference in pre- and post-intervention ratings for each created Subscale for the Goal Setting and Learning Diary groups.

a)



b)



c)

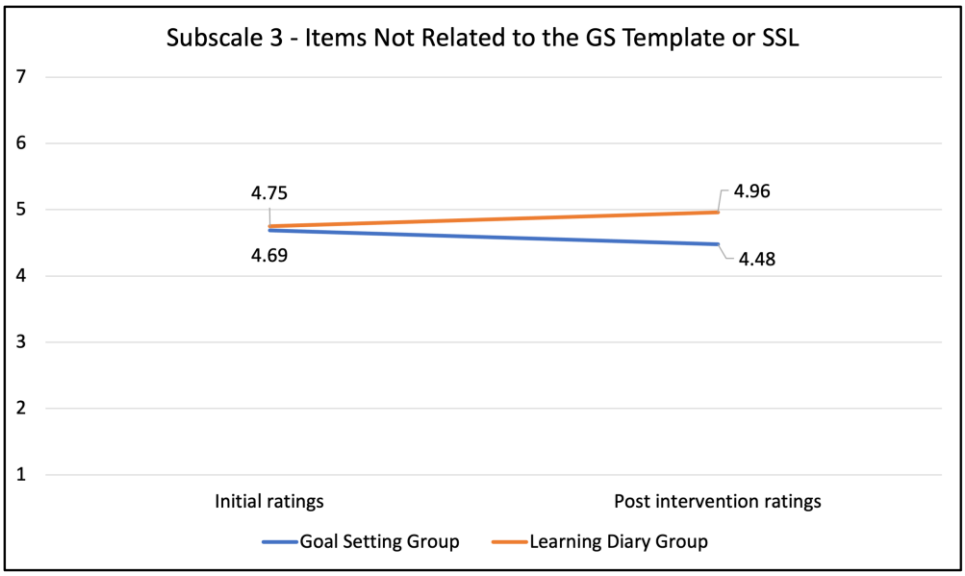


Figure 4.21. The difference in pre- and post-intervention ratings of Subscales 1, 2, and 3 for the Goal Setting and Learning Diary groups.

Fine-grained analysis investigating whether students' SRL ratings changed on specific study strategies they chose to create their weekly goals with was considered, however the group sizes were too small to be able to conduct this analysis for each study strategy.

4.7. Research Question 7: How many elements of a structured goal template do students include in an unguided learning diary? Can students create detailed goals without prompting?

There were five main elements in the ACE IT goal template: Action, Content, Evaluation/Efficacy, Importance, and Timeframe. These categories were broken down to create a rubric of goal elements that I and a co-rater used when evaluating students' learning diary entries across Weeks 1 to 4 in Fall 2019 and in Spring 2020. (See Table 4.14) Any discrepancies were discussed and a final agreement was reached for each learning diary entry. The proportion of ACE IT goal template items that were found present in learning diary entries can also be visualized in Figure 4.22.

Table 4.14. Rubric used to evaluate Learning Diary entries (n = 164) from Fall 2019 and Spring 2020 for essential goal elements.

Goal element and description	Present in LD	Absent in LD
Action (student indicates a concrete action to take – 'study,' or 'review' are not specific enough.)	154 (94%)	10 (6%)
Content (student indicates a specific topic to study. Entire chapters are not specific enough – e.g., 'Study Chapter 3.')	36 (22%)	128 (78%)
Evaluation (students have set a standard for themselves - a way to judge afterwards, whether they have achieved this goal or not.)	52 (32%)	112 (68%)
Efficacy (student includes a component about their confidence in being able to achieve their goal, **or** mentions an obstacle and how they might overcome it.)	12 (7%)	152 (93%)
Importance (student includes an element about why this goal is important to them, **or** how it might relate to their future, **or** how committed they are to this goal.)	9 (5%)	155 (95%)
Timeframe (student indicates what day **and/or** time they will work on the goal).	83 (51%)	81 (49%)

From Table 4.14 and Figure 4.22, the goal element present in most learning diary entries (94%) was the Action component. This can be attributed to students being asked to select a Study Strategy from the Study Strategy Library, and most students mentioned that study strategy as their Action when planning studying for the week. Timeframe was present in students' LD entries about 51% of the time; students indicated a time or day during which they would work on their study plan. About a third of the LD entries (32%) contained a statement by students about how they would judge for themselves whether they have accomplished their study plan for the week. Although most students included an Action in their study plan, only a fifth of students included in their study plan specific Content to act upon (22%). The two elements least present in students study plans were efficacy (7%) and importance (5%). Students rarely mentioned their self-efficacy in goal achievement, any obstacles they might face and/or overcome, why the study plan was important to them, their commitment to the goal, or how this studying plan relates to their future goals.

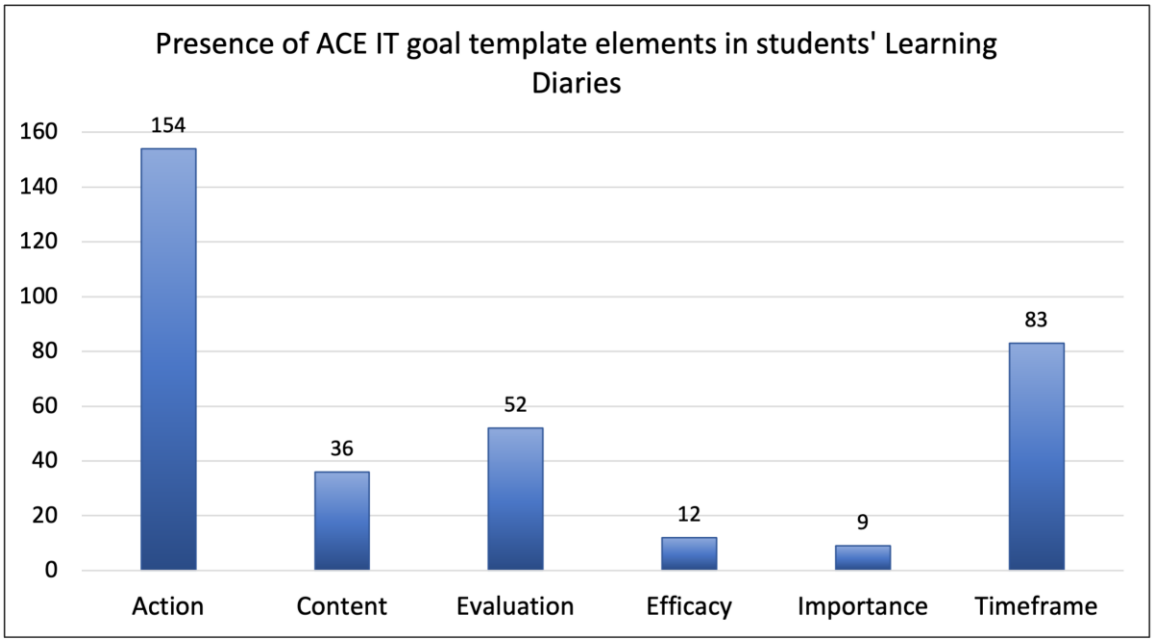


Figure 4.22. The frequency of each of the main elements from the ACE IT goal template found in students' Learning Diaries (*n*=164)

Chapter 5. Discussion

This research was designed to answer the following questions:

1. What are students' attitudes towards planning their studying for the week ahead (via a guided goal template or an unguided learning diary)?
2. How do students fill out and use a structured goal setting template?
3. What affects students' successes and failures at goal attainment when using a goal template?
4. How do students use and perceive a library of study strategies when creating weekly study plans?
5. Does academic achievement vary for students who have access to a library of study strategies when they are creating structured goals vs. keeping a learning diary?
6. Do self-reported SRL skills change in the goal setting group compared to the non-goal setting (learning diary) group?
7. How many elements of a structured goal template do students include in an unguided learning diary? Can students create a detailed goal without prompting?

In this chapter, I review findings related to each question, explain implications, note limitations, and identify opportunities for further research.

5.1. What are students' attitudes towards planning their studying for the week ahead (via a guided goal template or an unguided learning diary)?

Students' attitudes toward planning their studying were investigated by examining responses to the Student Perceptions of the Goal Setting Task questionnaire (guided goal template group) and the Student Perceptions of the Learning Diary Task questionnaire (unguided learning diary group). The questionnaires contained two types of questions: Likert response questions with levels of agreement as possible response options, and open-ended questions with text boxes for students to enter their responses. Thus, a mixed methods approach was used to determine student attitudes about planning their studying.

5.1.1. Goal Setting Group

The goal setting group provided mostly positive open-ended responses when asked how using the goal template each week impacted their goal setting skills, their overall studying, and their motivation. Common themes that emerged from open-ended responses about the positive aspects of the guided goal template were that it made their study goals organized, specific, and consistent, helped get them started with studying, and was a way to stay accountable with their studying. The one person who did not like using the goal template said it took too much time they could have otherwise spent studying. Overall, findings indicate that when asking students about their experience with the structured ACE IT goal template, students enjoyed having a structured way to organize their studying and determine what they would study, which helped them begin a study session. It was motivating to create a goal and kept them consistent and accountable to accomplish it.

Looking at responses to the Likert items, almost all students agreed or strongly agreed that the ACE IT template was helpful and worthwhile. When asked specifically if any parts of the template were not relevant, 75% of respondents said all parts were relevant. The two components students most frequently mentioned were not relevant, were "relating the goal to my future" (6%) and "describing the importance of my goal" (11%). As discussed later in section 5.2, these two sections of the ACE IT template were most often incorrectly filled out by students.

When students were asked to explain whether they would continue to use the ACE IT goal template in their studying, half of respondents said 'Yes,' because they found it valuable. However, over one-third of respondents said 'No.' Their reasons were that they already have preferred methods of studying, or they preferred not setting goals for their studying session.

A final analysis of students' responses to the Perceptions of the Goal Setting Task questionnaire compared students' agreement to the statement "The ACE IT template was helpful," to their final course grade in the course for which they set structured goals for four weeks. There was a statistically detectable positive correlation between students'

grades and their level of agreement that the ACE IT goal template was helpful. Students who performed better in the course were more likely to believe the goal template was helpful to their studying/goal setting.

Overall, findings indicate most students have positive perceptions of the ACE IT goal template and half said they would continue to use the goal template as they found it valuable. Those not preferring to use it cited specific aspects of the goal template ("future" and "importance") as irrelevant or believed completing the goal template each week takes too much time away from studying.

It thus seems students are open to using a guided goal setting template. Perhaps if students had the freedom to customize their template and to complete only sections they judged relevant and helpful to them, more might have positive reactions to it and continue using the template. Notably, students receiving higher final grades in their course were more likely to agree that the ACE IT goal template was helpful.

5.1.2. Learning Diary Group

The Learning Diary group provided positive open-ended responses when asked each week how using the learning diary impacted their studying. Common themes that emerged were it helped them plan their studying, kept them accountable, and allowed them to reflect on their studying. Most of the students said the learning diary kept them motivated to accomplish their plan, although about a fifth of respondents said it did not affect their motivation.

Looking at the students' responses to Likert items, almost all students agreed or strongly agreed the learning diary was helpful and worthwhile.

When students were asked whether they would continue to use the learning diary in their studying, almost half said 'Yes,' (46%) because they found it valuable to reflect and plan their studying. However, over one-third of respondents (39%) said 'No' because it would be time consuming (e.g., "Time thinking of how I'm learning distracts me from learning."). This finding is in line with the goal setting group. Some which students

preferred not to plan their studying because they didn't believe the time investment is worth it.

While it is understandable that students have limited time in which to study for all their courses, comments such as this one may reflect a lack of knowledge about the benefits of goal setting, metacognitive planning, and self-regulated learning overall. As past research has indicated (McCardle et al., 2017), students have difficulty setting goals and may not realize benefits it can have for studying and learning. It is important to encourage students to plan their studying, so they can begin to engage in a productive self-regulated learning process of planning, learning, reflection, and adaptation.

It is interesting that, although the ACE IT goal template requires much more involved completion and study planning on the part of the student than the simple learning diary, there was a similar ratio of students in each group who reported they would or would not continue using their respective tool: ACE IT goal template (Yes: 49%, No: 37%); learning diary (Yes: 46%, No: 39%). Assuming that students simply did not want to continue with the ACE IT goal template because it has so many components to fill out may not be warranted, as students also seem to reject a much simpler note form at a similar rate. Students who reported they would not continue planning their studying may just believe the extra time and mental effort is not worth it for them, regardless of how detailed or basic the goal structure is.

5.1.3. Comparing Goal Setting and Learning Diary responses

When the themes found in students' open-ended responses were compared between the Goal Setting and Learning Diary groups, there was no "stand out" theme. Participants in both groups appreciated being able to try new study strategies, experienced more accountability in their studying, and were more organized with their study plan. There wasn't too much variability across groups in the theme of responses, though students were presented with two completely different ways to plan their studying.

Two items that were dissimilar were that students in the GS group mentioned using the template helped keep their studying scheduled and consistent, a feature not mentioned by Learning Diary students. Perhaps because GS students were explicitly asked to create a timeframe for their goal, this helped them with consistent, scheduled studying. In contrast, Learning Diary students wrote about being able to reflect on their studying habits, and this was not mentioned by goal setting students. Goal setting students were asked at the end of each week whether they had achieved their goal, and to check off what made goal achievement difficult/helpful. However this may not have been as strong a prompt to reflect on studying compared to LD students who were asked generally about how well their study plan from the past week turned out.

5.2. How do students fill out and use a structured goal setting template?

Past research found using a structured goal form to guide students' goal setting was unsuccessful because students weren't reliably and accurately following the goal structure (McCardle et al., 2017; Webster et al., 2012). In this study, accuracy and completeness of students' responses to their ACE IT goals were coded by two raters using a rubric. Goals were then categorized as Complete goals (all components of the goal template completed accurately), Mostly Complete goals (1 missing/vague element in the goal template), Partially Complete goals (2 missing/vague elements in the goal template), or Incomplete goals (3 or more missing/incomplete elements in the goal template.

Across Fall 2019 and Spring 2020 among the goal setting students, Table 5.1 lists the relative percentages* and total numbers of each goal type across Weeks 1 to 4.

Table 5.1. Relative percentages* and total numbers of each goal type in Weeks 1 to 4.

	Week 1 (n = 37)	Week 2 (n = 37)	Week 3 (n = 37)	Week 4 (n = 37)	Total across Weeks 1-4 (n = 148)
Complete goals	28 (76%)	21 (57%)	19 (51%)	15 (41%)	83 (56%)
Mostly Complete goals	7 (19%)	8 (22%)	11 (30%)	10 (27%)	36 (24%)

Partially Complete goals	2 (5%)	7 (19%)	6 (16%)	7 (19%)	22 (15%)
Incomplete goals	0	1 (3%)	1 (3%)	5 (13%)	7 (5%)

*Percentage totals may add up to over 100 due to rounding.

As evident from Table 5.1, students started off creating mainly Complete goals in Week 1, though the quality of goals decreases as the goal setting continues to Week 4. Students transition from creating Complete Goals, to creating Mostly Complete or Partially Complete goals, missing one or two items in the ACE IT goal template. The number of incomplete goals among the 37 students increases as time progresses. Possible explanations for this trend include:

- Students felt using the ACE IT goal template each week was too repetitive so did not want to keep completing it accurately with full effort.
- Students became busy with the demands of their coursework and could not put adequate time into accurately and fully completing the ACE IT goal template. Results from Section 4.3 indicated that some students claimed one of the biggest obstacles leading to no goal achievement was lack of time.
- Toward Week 4, students had to prepare for midterms, and thus were creating study goals by writing "study everything for the midterm," which isn't a specific enough goal.
- Students did not complete the ACE IT template as accurately after the first week because they didn't find it helpful.

When examining the coding rubric to determine which specific items in the ACE IT goal template students were not completing, the most common items were the "importance," "evaluation," and "future" items.

For the "importance" item, students coded as 0 did not identify how their goal was related to their educational or personal values, though this is something past research has found valuable for goal attainment (Chase et al., 2013). Perhaps a future version of the ACE IT template could ask students to complete this section relating the importance of their goal to their personal or education values during the first week, rather than asking for this information every week. This way, students can be prompted to relate the goal to

their values, but do not have to repeatedly fill in these same values each week if it is resulting in lack of engagement with the goal.

For the "evaluation" item, some students had difficulty setting a standard by which they could assess their achievement of their goal. It is important to set a standard when creating a goal, because it allows students to reflect at the end of the week whether they did achieve their goal. A standard containing a specific action and content allows for students to be able to accurately assess whether they have achieved that standard. A limitation here is students were not explicitly taught how to develop a good standard for evaluating achievement of their goal. Specific training, for example, on how to use verbs from Bloom's taxonomy of cognitive learning objectives (Bloom & Krathwohl, 1956) to characterize mastery of knowledge, as well as reminders to include what content students want to evaluate, may have encouraged better evaluation ratings. Future research and goal setting instruction should consider including a detailed explanation of how to create high quality goal standards on which to evaluate one's goals.

For the "future" item, there weren't many 0's but the those that were present were students saying their goal did not align with their ideal future, or they didn't know how the goal would align with or benefit their ideal future.

In Week 4 for both Fall and Spring students, lack of topic specificity was present mostly because students were writing goals for "all lectures covered on the midterms, nothing specific" or "everything. I have a midterm this week." These responses to the "Topic" item are not specific enough and thus were coded as 0.

Similarly, some students lacked specificity in the "time" item because they would mention what days they would study, but not a specific time period of day or hour of the day.

Although studying the role of motivation in students' responses to the ACE IT goal template was out of the scope of this research, future research can involve coding students' responses to the Obstacle item of the ACE IT goal template from the lens of attribution theory. Do students attribute the obstacles they might face to external factors,

or internal factors? Future research can investigate the locus of causality to which students attribute their obstacles and how they can be overcome.

Summing up the findings to Research Question 2, contrary to previous research, students can complete a structured goal template by completing specific slots. This is evident from mostly Complete goals in Week 1. However, across four weeks of the intervention, goal quality decreased, possibly due to one of the explanations given above. Looking back at student responses when asked about the ACE IT goal template in Research Question 1, although students' goal quality decreased, they still found the ACE IT template helpful, motivating, and allowed for consistent and organized studying. When asked if any particular items were not helpful, the two items they mentioned were "importance" and "future." Thus, it may be that students did not find value in relating the importance of their immediate goals to personal values or their ideal future, and thus put less effort in completing these components of the structured goal template.

When students' goals were coded for quality and correlated with final course grades, higher goal quality predicted higher course grades. This is in line with previous research that higher goal quality relates to higher academic achievement (Webster, Miller, & Hadwin, 2012). There could be several factors underlying this correlation. Constructing higher quality goals might directly promote learning and achievement. Further research might explore how this could occur. Possibilities include selecting appropriate information to study what matters, selecting a productive strategy to use when operating on selected information, and having relevant standards to metacognitively monitor the products of those operations (e.g., COPES, Winne, 2004). Another possibility is that students who are more attentive to instructions or more motivated to succeed academically are more likely to exercise beneficial goal setting skills.

5.3. What affects students' successes and failures at goal attainment when using a goal template?

It is not enough to simply provide students with a structured, research-based goal template and ask them to create goals each week. Rather, it is imperative to ask students

to reflect on these goals each week, thereby encouraging self-regulated learning. Students in the Goal Setting group were asked each week to fill out a reflection survey, which first asked if they achieved their goal from the previous week. After answering either "Yes," "Somewhat," "No," or "Undecided," students were given specific follow-up questions to assess what was helpful to or hindered their achievement.

Most students reported achieving their goal each week. Students who achieved their goal attributed it to three main reasons: the study strategy they chose was easy to use and effective; they had enough time to work on their goal; or the course content they were working on was easy to learn. Students who did not achieve their goal that week reported a lack of time, other obligations with higher priority, or a lack of commitment to their goal. These reasons are in line with usual student complaints about lack of time and heavy coursework which affect their academic performance. Students who said they somewhat achieved their goal, or were undecided, believed their course content was easy to learn and their chosen study strategy was easy to use but they too lacked time and commitment to their goal.

When all the Goal Setting students were asked specifically if there were any factors that could have made goal achievement easier, students open-ended responses varied. The most common responses, summarized, are:

a) More time to achieve the goal
b) Fewer distractions while studying
c) More motivation
d) Better use of the goal setting template (e.g., "I should have spread out my studying," "I misunderstood how long it would take to achieve my goal")

Finally, students were asked to write any other comments they had about using the structured goal setting and their success or failure at goal attainment. Factors that help students succeed in goal attainment when using the goal template included:

- The study strategies were effective at helping students learn and study the course content.
- Creating a goal provided motivation to achieve and avoid procrastination or last-minute cramming.

- Goal setting helped organize what material should be studied each week.

Factors that contributed to students' lack of complete goal attainment when using the goal template included:

- At times it was difficult to adjust to a new way of studying (using the ACE IT template) and use the provided study strategies.
- Specifying a specific time of day/week to work on a goal, when normally the student would just work on the task as time permitted.
- It was hard to commit to the ACE IT goal due to other courses and exams at the same time.
- Consistency and staying motivated affected students' goal achievement.

Based on these findings, it can be concluded that guided goal setting is perceived by students to be helpful because it provides them with a way to schedule and organize their studying. Receiving a list of relevant study strategies they could use in their course was also seen by students as beneficial. It would be advantageous to provide students with reasons *why* it is helpful to commit a bit of time to planning their studying at the outset of a study session, or at other regular intervals. Students would benefit from instruction on how to become efficient self-regulated learners. They repeatedly mention a lack of time and motivation as barriers to goal achievement. Perhaps if students were taught the benefits of self-regulated learning, planning, monitoring, and making adaptations to one's own learning, they would find it easier to take time to plan their studying and improve goal and academic achievement.

5.4. How do students use and perceive a library of study strategies when creating weekly study plans?

All students in the research, whether completing the ACE IT goal template, or the learning diary, had access to a Study Strategy Library (SSL). It contained 11 study strategies, along with research backed reasons on why those strategies are beneficial, and how to use them during studying. I wanted to investigate how students would feel about

having access to such a resource, and how they would use it (see Appendix A for complete Study Strategy Library). Overall, most students agreed that the SSL contained study strategies they could use in their studying, and a fewer number agreed that it could help motivate them to study harder for their other courses. 71% of the Goal Setting group and 80% of the Learning Diary group said they would continue using the Study Strategy Library in their studies and found it beneficial.

When comparing the usage of each of the 11 study strategies from the list, the two most popular study strategies among the GS group were Creating Compact Notes and Highlighting/Underlining. In the LD group, the two most popular study strategies were Creating Compact Notes and Creating and using Flash Cards. The two least used strategies across both groups were Synthesizing Information and Visiting Professor or TA Office Hours. Perhaps students preferred to use strategies they were familiar with and had used before. Or, maybe the content of the EDUC course they were studying was best learned by highlighting, creating notes, and using flash cards. It may be that students felt less confident in synthesizing information, and maybe visiting Professor/TA office hours to help them succeed in their studying was not important.

Past research on goal setting has not implemented the use of a catalogue of study strategies provided to students to jump start their goal setting, studying, and self-regulating learning. Results from this study reveal that this could be a beneficial component to include, not only in research but in practice. Instructors can, at the start of the term, provide research-backed study strategies to students, along with instructions on how to use them. Prompts by the course instructor for students to use these strategies may help students' confidence when it comes to knowing how to study. Students can use action-based strategies rather than passive reading and reviewing to really work with the material and encode it.

Students were asked to rate their confidence in using each of the study strategies at the very beginning of the research and at the end of the four weeks after using the Study Strategy Library. Statistically detectable differences were found and students had higher post-intervention confidence ratings for 8 of the 11 study strategies: Creating

Compact Notes, Highlighting/Underlining, Self-questioning, Creating Practice Questions, Creating and using Flash Cards, Spaced Practice, Synthesizing Information, and Self-explanation. It is interesting that students gained confidence in Synthesizing Information, even though it was one of the least frequently used strategies.

The three strategies where no statistically detectable differences were found between initial and final confidence ratings were Summarization, Effective Note-taking in Lectures, and Visiting Professor or TA Office hours. Based on the confidence ratings, students were least confident in Visiting Professor or TA Office hours, before and after the intervention.

When comparing overall strategy confidence ratings between the GS and LD groups, students in the Learning Diary group had a statistically detectably greater increase in overall confidence rating from the beginning to end of the intervention, compared to students in the Goal Setting group. It may be that students in the goal setting group had the many components of the ACE IT template to focus on besides confidently using the provided study strategies. Learning Diary students could focus on using various study strategies and improve their confidence, whereas goal setting students were trying to become comfortable with the ACE IT template. An alternate explanation is perhaps the act of engaging in goal setting for the GS students made them feel a lack of confidence in their goal setting ability, and this carried over to the SSL as well.

5.5. When students have access to a library of study strategies, is there a difference in academic achievement between those who create structured goals and those who keep a learning diary?

Because students were assigned to create either ACE IT goals or Learning Diaries, final course grades in the education course for which students were planning their studying were compared to explore detectable differences in academic achievement. Due to the world pandemic causing a shift to remote instruction halfway through the Spring 2020 term, Fall 2019 and Spring 2020 grades were examined separately. In Fall

2019, there was no statistically detectable difference in students' final course grades, between the LD (M = 3.74, SD = 0.53) and GS (M = 3.42, SD = 0.47) groups.

In Spring 2020, participants who wrote in a learning diary had statistically detectably greater final course grades (M=3.57, SD=0.39) than participants who used the ACE IT goal template (M=3.25, SD=0.51), $t(47)=2.48$, $p < .05$.

The purpose of the ACE IT goal template was to encourage students to create specific, actionable goals at a regular schedule so they could keep up with their studying throughout the term and succeed in their course assessments. The guided ACE IT goal template was meant to enhance one component of students' self-regulated learning - goal setting and planning. However, from the Spring 2020 results, students in the Learning Diary group were achieving higher final grades than students in the Goal Setting group. It is unclear why exactly students in the ACE IT goal setting group achieved lower grades than those writing in the learning diary because, when asked about the ACE IT template, students were complimentary and most found it beneficial to their studying (see section 5.1). However, it may be that completing the ACE IT template weekly was burdensome to students, and though the intervention lasted throughout four weeks, it was not enough time for students to learn accurate and complete goal setting to continue using in their course when studying for the final exam. Future research might explore a guided *scaffolded* template, in which the specific ACE IT components are introduced, then gradually taken away over a period. This way students become familiar with the important elements they should include in a comprehensive studying goal and can continue to create specific goals even after their prompts are removed.

An alternate explanation could be that though GS students usually reported achieving their set weekly goals (see section 5.3), it was more likely for LD students to achieve their learning plan and study course content in a more productive way. Students who completed a learning diary were asked to write a reflection at the start of the next week, before creating their next learning plan. These reflections were open-ended, and students were not asked specifically if they achieved their plan from the previous week, thus the reflections were not coded. As an example, one student reflects, "Last week I

made a plan to use the strategy of summarization to help with my readings. I don't think I've completely mastered what it means to skim read, but I did find my time studying with the practice of summarizing what I read did help. It forced me to think about each paragraph I read, not just copy things down, but really ask myself, what is this paragraph saying and is this paragraph important?" It may be that overall, LD students were more productive with achieving their learning plans, and thus they were able to continue planning their studying in a general way, throughout the whole course.

There are no data available to investigate whether students did use any of the goal setting training from the intervention (i.e., the Study Strategy Library, the ACE IT goal template, or the learning diary prompts) after data collection was complete. Future research can investigate students' goal setting habits longitudinally; after experiencing a goal setting routine for four weeks, is there decay in students' continued use of any aspect of the goal setting techniques until the end of the term?

5.6. After a four-week intervention, is there a difference in students' reports about self-regulated learning (SRL) skills between the Goal Setting group and the Learning Diary group? Does group participation affect change in reported SRL skills from initial ratings?

All students completed the SRL skills questionnaire and then either participated in writing ACE IT goals or Learning Diaries over four weeks. Students completed the SRL questionnaire again at week 5 when the intervention was concluded. I wanted to investigate whether creating specific goals containing elements empirically found to be beneficial in goal setting would enhance students' SRL skills, when compared to a group who planned their studying with no instruction on empirically supported goal setting components.

There was no statistically detectable difference between students' pre- and post-SRL scores, and no difference between the GS and LD groups in combined SRL scores. Both the GS and LD groups had comparable pre-intervention ratings on items in the SRL questionnaire. However, the GS ($M = 4.41$, $SD = .11$) and LD ($M = 4.79$, $SD = .10$)

groups had statistically detectable differences in post-SRL ratings. GS students' SRL ratings became statistically detectably lower after participating in four weeks of goal setting. There was no statistically detectable change in pre-post scores for the LD group.

A possible reason that SRL scores changed for the GS group, but not for the LD group, could be that the LD group was given much less support during the intervention, thus it is more likely their self-regulated learning habits would not change too much by participating in an unguided learning diary for four weeks. In other words, people's perceptions of their SRL as measured by this questionnaire didn't change because of the intervention.

The GS group's SRL scores were expected to increase after participating in the intervention, as students are given instructions on how to plan and reflect on their studying, encouraging adaptation for the next goal setting session. However, SRL scores decreased. It may be that students' ratings of their SRL declined after the intervention because, by engaging in the ACE IT goal setting, students realized how to correctly use study strategies and engage in self-regulated learning, and they realized they are not doing these things in their studying. So, the post-intervention SRL ratings went down, as students had a better idea of what ideal self-regulated learning and studying looks like and were more critical in their ratings of themselves.

An additional analysis involved grouping the 46 items from the SRL questionnaire into three separate subscales, 1) related to the Goal Setting template, 2) related to the study strategies (from the Study Strategy Library), or, 3) not related to the GS template or SSL. The intent of this was to configure an instrument that might be more sensitive to possible effects from the intervention. For Subscale 1 (related to the Goal Setting template), students in the two groups had comparable ratings before the intervention but there was a difference in post-SRL ratings. Those who created learning diaries rated themselves as having higher SRL scores in those items related to goal setting than those who created ACE IT goals. It is difficult to draw valid conclusions from this finding because the post-reliability of the subscale was low. However, this is an interesting finding because, ideally, the SRL item ratings that are related to the ACE IT

goal template should become higher for the goal setting group once they participate in planning their studying via specific guided goals. It may be a similar reason as before, that after creating goals, students are more aware of what they might be lacking in goal setting, and thus are rating themselves lower after the intervention.

For Subscale 2 (related to the study strategy library), the SRL ratings for both groups decreased from the start to the end of the intervention. There was also a detectable difference in post-SRL ratings between the GS and LD groups. Although both groups had positive perceptions of the study strategy library, perhaps, similar to Subscale 1, after using the study strategies, students became more aware of how the study strategies should be used, and realized they were not as proficient in their abilities as reflected by their initial ratings. Thus, students became aware of the correct use of the study strategies, and are not yet confident in the specific SRL items that relate to the study strategies in the SSL.

For Subscale 3 (items not related to the GS template or SSL), the Learning Diary group's post-intervention ratings differed statistically detectably from the Goal Setting group's ratings. The ratings by the GS group decreased from their initial ratings, while the LD group had increased ratings compared to before the intervention. Similar explanations as above might apply here, though low reliability of the subscale here makes interpreting the results a challenge. Future research can investigate the use of relevant subscales with high reliability to be able to draw confident conclusions from the results.

5.7. How many elements of a 'structured goal template' do students include in an unguided learning diary? (i.e., can students create a detailed goal without prompting?)

Students' learning diary entries were coded according to a rubric containing the elements of the ACE IT goal template (Action, Content, Evaluation, Efficacy, Importance, and Timeframe) to determine which elements students would include in an unprompted learning plan. 94% of the learning diaries students created across the four weeks contained an Action. This can be attributed to students being provided with the

Study Strategy Library and being instructed to use one of the actionable strategies in their learning plan.

22% of the learning diaries included Content. There is a lack of topic specificity when students plan their studying, as they write that they will complete "the readings" or highlight "the textbook and notes," which do not indicate a specific topic or content they want to master and learn. Lack of topic specificity also makes it hard for students to then evaluate their learning to determine whether their goal has been achieved. Students should indicate a specific course topic to learn, and once they work on their goal, be able to evaluate their learning because they have been specific about their learning goal. Goal specificity encourages goal directed actions and enhances goal achievement (Latham & Locke, 1991).

32% of learning diaries contained an aspect of Evaluation. This means students wrote some standard, a reference point they would be able to evaluate whether they achieved their plan. Considering students were not prompted or trained at all in creating a standard for their learning, this is a substantial finding. One-third of the 164 learning diaries students created over four weeks in Fall 2019 and Spring 2020 included a standard for evaluating their learning. When students can evaluate their learning, they can decide what, if any, adaptations to make to their studying processes, which is an integral part of self-regulating learning (Winne & Hadwin, 2008).

7% of the learning diaries contained information about students' efficacy – a comment about student' confidence in being able to achieve the goal, or an obstacle and how the student might overcome it. Schippers et al. (2020) found that students who wrote in more detail their strategies and obstacles to attain their goal had greater academic performance. Students in the LD group rarely commented on their confidence in achieving their plan and did not usually mention obstacles they might have to face and overcome in completing their learning for the week.

5% of the learning diaries explained why the goal was important to the student, how it related to their future goals, or how committed they were to the goal. It is interesting that this element was present the least in the unprompted learning diaries.

When goal setting students were asked about specific components of the ACE IT template, the "importance" and "future" elements were the ones they named as being least relevant to them in their goal setting. Similarly, when students' ACE IT goals were coded, many times the "importance" and "future" elements were filled out inaccurately or were incomplete. Though past research found writing about one's ideal future predicted greater academic performance (Morisano et al., 2010), and creating personally meaningful goals led to higher GPA (Chase et al., 2013), it may be that students do not need to write out the goal's importance and its relation to students' future goals every time they set a learning goal. As mentioned previously, future research can include these two components solely at the outset of a goal setting intervention rather than asking students to write them out every week as they create their studying goal.

51% of the learning diaries contained a Timeframe (student indicated what day and/or time they would work on the goal). It is important for students to clearly indicate a specific time during which they can work on their goal because time management becomes difficult as other courses and personal obligations come up during the week. Including a timeframe also aids in creating more specific goals (Acee et al., 2012). Beckman et al. (2021) noted that a timeframe was least present in students' self-set goals, indicating a lack of checkpoints at which students can evaluate their learning. Thus, it is promising that students who wrote in the learning diary were able to, at least half the time, include a timeframe in their learning plans.

5.8. Limitations and Future Research

A common limitation to student self-reflections and self-reported skills is that self-reports can be different from students' actual behaviours (Jamieson-Noel & Winne, 2003). Students were asked to rate their confidence in their SRL skills before and after the intervention, and it is possible they could misjudge their confidence in their ability to use a specific skill. Similarly, students rated their confidence in the strategies from the Study Strategy Library. Finally, students wrote their own weekly reflections about their studying achievement. Self-report data could be strengthened by adding trace data as students engage in a learning session (Jamieson-Noel & Winne, 2003; Winne, 2020),

although, it may be difficult to gather such trace data when students are engaged in studying in a naturalistic setting on their own time throughout the week. Similarly, although I am asking students to write reflections, I don't know exactly what their cognitive processes are as they engage in goal setting and evaluating their studying each week.

Regarding students in the goal setting group, more training in using the ACE IT goal template may have been advantageous. For example, students were not explicitly taught how to write a good standard for evaluating their achievement of their goal. Specific training on how to use Bloom's taxonomy of verbs to evaluate mastery of knowledge, as well as reminders to include what content students want to evaluate, may have encouraged better evaluation entries and higher goal quality scores. An additional limitation is that students' goal setting abilities were not assessed before they participated in creating ACE IT goals. Future research could have students create an unguided goal, use the ACE IT goal template over four weeks, and then assess their unguided goals for the rest of the term, to determine any carry-over effects in that course or their other courses.

The students in the Learning Diary group did receive a prompt to write about their studying plan. Some may find this too similar to encouraging goal setting, and a limitation of the study. However, this research did not intend to compare a comprehensive goal setting template to no goal setting. I wanted to encourage the LD students to create an open-ended learning plan, so I could compare what elements of a typical goal students would include in an unguided plan.

When using the Study Strategy Library, it is hard to know how exactly students used the study strategies they chose each week. Were they implemented correctly? It is possible that the instructions provided in why and how to use the strategies were not sufficient. I considered a fine-grained analysis investigating whether students' SRL ratings changed on the specific study strategies they chose each week. However, I was limited by small sample sizes to be able to conduct this analysis for each study strategy.

An analysis outside the scope of this research but possible for the future is comparing students' goal quality with their goal achievement. If students set a Complete goal in Week 1, did they achieve their goal at the end of the week? What if students set a Partially Complete goal, how does that relate to their goal achievement? McCardle et al. (2017), describe this as comparing task performance across levels of goal quality, when goals are self-set. Also, goal difficulty was not assessed. According to goal setting theory, challenging goals can lead to higher commitment and achievement (Latham & Locke, 1991). Although I did ask students to write out an obstacle and a way to overcome it, which can be seen as identifying a challenge in their goal, goal difficulty was not specifically assessed. Future research can investigate this aspect of students' goals, and compare goal difficulty to other factors such as academic achievement.

Though students were given research-backed reasons on the benefits of the strategies in the Study Strategy Library, the benefits of setting goals and how it relates to self-regulated learning were not fully explained to study participants. Future research might incorporate this training, so students do not feel that spending time to create a study plan is a waste that could otherwise be used to study.

Another possible limitation is that goal quality coding is subjective. For example, McCardle et al. (2017) and Beckman et al. (2021) both used TASC elements, but Beckman et al., counted "well in advance" (p. 10) of submission deadline as a Timeframe, whereas I don't believe McCardle et al. (2017) would allow that as a Timeframe element, and our coding methods would not count this is a Timeframe element. There are inconsistencies when coding students' goal content in research studies. McCardle et al. (2017) did not give points for goals where students did not signify a specific content topic to be learned, and merely gave a generic statement such as "study Chapter 3". Conversely, Alessandri at al. (2020) did count as a goal a general studying statement such as "studying for at least three hours in the afternoon" (p. 4). In fact, "studying" would be considered a specific goal action in some goal setting research but too generic a statement of goal action in other goal setting research. The goal coding in this study was more detailed than in most past research.

It may be that if students effectively set and achieve goals in one domain (e.g., their Education course), this can have carry-over effects to their other courses, and perhaps their overall academic achievement (Morisano et al., 2010). In future research, obtaining students' overall semester grades can answer questions about any carry-over effects of goal setting.

5.9. Instructional Implications

In the context of encouraging students' self-regulated learning and goal setting, my study leads to the following instructional implications and recommendations:

1. Present students with a catalogue of study strategies, including reasons why they are beneficial and instructions on how to use the strategies.

2. Encourage and incorporate a way for students to plan their learning each week. The template does not need to be specific – an open-ended prompt asking students to create their weekly learning goal will be sufficient.

3. Allow for weekly goal reflection. Ask students to reflect about their studying during the past week and make any adaptations for the week ahead.

4. If presenting students with a structured goal setting template, provide plenty of training and guidance in how to create a high-quality goal. Ensure students' feel the time investment is worth it for their learning goals.

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Appendix A. Study Strategy Library

READING COMPREHENSION / NOTE-TAKING

1. Study Technique: Creating Compact Notes

What is it: Creating short notes from your reading, so that you can obtain the most important information from each paragraph.

Why it works: Students who take notes with a limited amount of words from the reading recalled more facts, recognized more concepts, and inferred more relationships among information from a reading than students who copy-and-paste or take down notes word-for-word as they study and read (Igo, Bruning, McCrudden, 2005).

How to use it: As you are reading for your class, analyze each paragraph to choose just 5-7 words from it that best represent all the important information in the paragraph. Make a compact note about each paragraph. Title each note. Try to use only your chosen 5-7 words in the note's body. Do not copy and paste entire phrases or sentences into a note.

2. Study Technique: Highlighting/Underlining

What is it: Marking information in the text that you think is important, either by highlighting it, or underlining it.

Why it works: When students actively think about what they are reading and highlight text that is relevant or important, their reading comprehension improves; and when they are passively reading and highlight unnecessary or unimportant information, there is not much comprehension (Long & Long, 1987; Peterson, 1992). When students are metacognitively involved in thinking about what text they should highlight or underline, they are better able to remember the text they have marked (Marzouk, 2018).

How to use it: Try to complete this study technique the first or second time you go through your readings. As you read, think about the information you are reading, and highlight or underline any information you think is important. Students who highlight or

underline text usually do so because they will come back to the sections they marked, to review them several times further before the exam. So, when you are reading, decide whether each section of text is important according to the criteria set by your instructor, and if you think it is, highlight or underline it. Try not to highlight everything in the text. When you have time to review, come back to your text and re-read the highlighted/underlined sections.

3. Study Technique: Self-questioning

What is it: As you read through the text, be actively reading by asking yourself questions about the content you are reading.

Why it works: When students generate their own questions as they read or study new material, their reading comprehension improves (Rosenshine, Meister, & Chapman, 1996; Wong, 1985), and their long-term recall is higher than for students who only read the text (King, 1992).

How to use it: As you are doing your reading for the first time, ask yourself questions like "What is the main idea of this paragraph?" or "How" and "Why" questions about the material that will help you understand it better, and give you a better sense of why you should be reading this information, and how it will help you in your assignment or exam. You can even further your self-questioning beyond the text you are reading to ask yourself "what examples do I have from my personal experience that applies to this information?"

<u>REVIEW AND EXAM PREP</u>

4. Study Technique: Creating Practice Questions (Retrieval Practice, Self-testing)

What is it: Creating questions to test your knowledge and try to recall information you have read and studied previously.

Why it works: When you try to bring information to mind that you have learned previously, it makes the connections to that information stronger, and enhances learning and makes future recall of that information easier, by slowing the rate of forgetting (Carpenter, Pashler, Wixted, & Vul, 2008; Roediger & Karpicke, 2006). You will learn the most when studying if you can correctly answer your practice questions more than once and studying takes place across multiple days (Rawson, Dunlosky, & Sciartelli, 2013).

How to use it: As you are doing your readings, think to yourself, could this material be tested on? Try to create a question for each section, paragraph, or topic you think might be on the exam. Write all your questions down on a piece of paper. After you are done reading the chapter, or article, look at your question paper. Try to answer each question, without looking back at your reading or notes. How much could you recall? Take note of information you could not remember, so that you can go back and study it. Try to answer your practice questions several times, over multiple days, before the exam, so you can practice retrieving the correct information and learn as much as possible.

5. Study Technique: Creating and Using Flash Cards (Rehearsal, Retrieval Practice, Self-testing)

What is it: This technique includes rehearsal of information and self-testing, in which you create notecards with information on one side and a question or prompt on the other. Then try to test yourself to see if you can recall the information using only the question or prompt.

Why it works: Trying to retrieve information regularly through self-testing can improve learning and enhance meaning of information (Karpicke & Roediger, 2006). Practicing retrieval of definitions improves retention more than re-reading and highlighting information (Roediger & Butler, 2011). When you study and test your knowledge using flashcards, it is better to space out the testing over a few days rather than cramming your self-testing (Kornell, 2009).

How to use it: Try to complete this study technique at least a week before the exam. When you create flash cards, you write down information you want to study on a paper/card, and then write a question on the other side of the paper/card. Or, when studying vocabulary, you can write the term on one side and its definition on the other. After you create some flash cards for the information you want to study, test yourself with them. Look at only the question/prompt side and try to answer it without looking at the back of the card. Repeat this self-testing several times before the exam, until you can thoroughly and accurately answer the questions without looking at the answer.

6. Study Technique: Spaced Practice

What is it: When you space your practice, it means you spread out the studying of your course content over several sessions rather than in a crammed studying session.

Why it works: When students space out their studying over several sessions, it is better for long term retention (Carpenter, Cepeda, Rohrer, Kang, & Pashler, 2012). Cramming does not work for long-term retention, even though it might give students confidence in the short term that they will be able to remember the content (Roediger & Karpicke, 2006).

How to use it: Plan out your studying well in advance of the exam. Plan several study sessions throughout the term and study each topic area you have learned so far in the course during each study session, so you get regular review of each topic. Make sure you don't leave too much time between your study sessions, or you might forget the content you have studied. Introduce other study strategies into your spaced study sessions, such as creating practice questions, or synthesizing information.

ELABORATION / ORGANIZATION OF INFORMATION

7. Study Technique: Synthesizing information

What is it: Bringing together information from different sources, and from your prior knowledge.

Why it works: When students integrate ideas from different sources and decide how to organize and order the information, it results in knowledge transformation and schema assembling, which improves encoding and recall (Mateos, Martín, Villalón, & Luna, 2008; Nassaji, 2002, Thorndyke & Hayes-Roth, 1979).

How to use it: As you read and study, try to write a synthesis of important information, by restating the information, and elaborating on it with knowledge you have acquired from another source, or from what you already know. Draw conclusions and relate the material to examples and analogies from your own experience. Try to establish connections between various ideas in one text, or between ideas in two or more texts.

8. Study Technique: Self-explanation

What is it: Explaining how new information is related to known information, or explaining steps taken during problem solving.

Why it works: Self-explanation can be used across a range of subjects and tasks (Dunlosky et al., 2013). It works because while self-explaining, students are integrating new information with existing prior knowledge (Dunlosky et al., 2013), which helps make new connections. when students interact with content and use their previous experience and knowledge to construct meaning, they are better able to understand and remember the content (King, 1992).

How to use it: When reading a new piece of information, try to explain to yourself, how is this related to information you already know? Say out loud or write down your explanation, relating the new information with something you already know. Another way to self-explain is, when reading about a procedure try to explain to yourself why each step follows the preceding step.

9. Study Technique: Summarization

What is it: When reading a large amount of information, summarize the overall meaning and importance by paraphrasing and writing about it in your own words.

Why it works: When students are reading, metacognitively thinking about the meaning of the text and deciding what is most important to learn and write about in a summary helps improve recall of the information (Rinehart, Stahl, & Erickson, 1986). Basic rules of summarization include deletion of unnecessary material and creation of a topic sentence (Brown & Day, 1983). Creating only a few summaries per chapter is better than creating many summaries because it requires greater effort and produces better performance, and students who created summaries for a text remembered the text better on an exam (Foos, 1995).

How to use it: As you read a text you want to summarize, think about what the most important components of the text are, and what is unnecessary information you can leave out of your summary. Make sure your summary has a comprehensive topic sentence that can convey the overall meaning of the information you are summarizing.

NOTE-TAKING IN LECTURES AND GETTING HELP

10. Study Technique: Effective Note-taking in Lectures

What is it: While in lecture, it is important to take notes on information you want to remember and study. In some classes, the instructor provides the notes or an outline in advance. You can print this out and use it to guide you when you are taking notes in class.

Why it works: When making the decision of what the most important information is, it helps greatly to have done the readings in advance. This way when you attend lecture, you have an idea of what information to expect, or ask questions about. Taking notes by hand is more advantageous than on a laptop, mostly because students tend to multitask when using their laptop in class, and this leads to lower achievement (Sana, Weston, &

Cepeda, 2013). It can also be distracting to your classmates. Taking notes by hand also gives you a chance to process the information and decide what information you want to record.

How to use it: Prepare before lecture by doing the assigned readings. Make note of anything from the readings that you want more information about. Print out any pre-provided note outline and add to this when taking notes in lecture. You can also look into note-taking techniques such as the Cornell Note-taking System, which gives you tips on how to divide your page in an effective way.

11. Study Technique: Visiting Professor or TA Office Hours

What is it: Going to your instructor's set office hour time (or making an appointment for an alternate time) to ask questions and gain more clarity about course content and examinations.

Why it works: Research shows that when students interact with faculty more, they are more likely to want to stay in college and not drop out (Lillis, 2011). They also seem to put more effort into their educational activities (Kuh & Hu, 2001).

How to use it: Instructors are there for you during their office hours, to answer questions and help you understand the content. Go to office hours early in the term, don't wait until right before the exam. If their set time doesn't work for you, email and ask if they can meet you at a different time. Explain to your instructor what you are having trouble with and try to have some specific questions for them. For writing assignments, show them the work you have done so far and ask for further feedback and direction, and for exam preparation, show how you have been studying relevant topics and ask whether you are on the right track, to make sure you aren't missing any important content. It is also very helpful to go over past tests/assignments from the course with your instructor if you don't understand why you lost marks and ask how you can improve for next time. A final benefit of going to office hours is expanding your professional network, learning about a new research area, and potentially gaining a reference for your future.

Appendix B. Goal Setting Training

You will create an academic goal each week, using the **ACE IT** goal template.

A - Action

C - Content

E – Evaluation/Efficacy

I - Importance

T - Timeframe

There are 5 parts in the ACE IT goal template: Action, Content, Evaluation/Efficacy, Importance, and Timeframe. Ensure you fill in each text field fully and accurately with your information. There are also two instances where you must rate your confidence/ability in the goal template.

You will be sent the link to this Goal template on Saturday each week, and you have three days, from Saturday 12pm to Tuesday 12pm to complete your Goal. Please make sure the goal is complete and submitted before Tuesday 12pm, so that you can focus on achieving your goal and studying for the rest of the week.

<next page>

1. ACTION: In the first part of the goal template, you will choose a study strategy or study skill as your main goal action for the week. Think about what you want to study that week, and what study strategy would best fit how and what you want to study.

Go to the study strategy library and choose from one of the study strategies listed.

The study strategy I will use this week is:

e.g. self-explanation

Please take a minute now to go to the study strategy library and explore the different study strategies and how to use them. At the bottom of each study strategy, it asks you to rate your confidence in using that technique or skill. Think about your past studying skills and rate your confidence with using each study strategy.

Go to study strategy library ->

<next page>

2. CONTENT: Indicate the course you will focus your goal on this week, then write out the topic you will create a goal for (e.g. DNA replication; ADHD; The Big Bang Theory, etc.). Try to be specific.

My goal for this week is for the | *e.g. Psych 101* | course:

topic I want to focus on is: | *e.g. personality disorders, specifically the definition and symptoms of obsessive-compulsive disorder* | The

<next page>

3. EVALUATION/EFFICACY:

In this section, you will determine what the end goal is for you. What outcome will you have achieved when you complete your goal?
In the box, write out what your desired outcome is (how you will know when you have achieved the goal).

I will know I have achieved this goal when I am able to:

e.g. explain the differences between Vygotsky and Piaget's theories

Write out any obstacles you might face when trying to achieve the goal for this week:

e.g. An obstacle I might face is that I may not understand how to do self-explanation properly. Another obstacle is that I might be tired after work on Tuesday and not feel like working on this goal.

How will you overcome your obstacle(s)?

e.g. I will overcome my first obstacle by reading about how self-explanation works in the study strategy library. I will overcome my second obstacle by sleeping early on Monday night so I have enough energy for work and studying on Tuesday. I might take a short 15min. nap after work to gain energy for studying.

How confident are you in your ability to achieve this goal in the coming week? Rate your confidence.

Very confident 5……4……3……2……1 Not at all confident

<next page>

4. IMPORTANCE: Indicate why is this goal important to you.

How is the goal related to your educational or personal values? What do you want to achieve in your academic career, and how will this goal help further that?

e.g. This goal is related to my values because I value hard work and want to put in my best effort for this psych course, so I will try doing self-explanations while I study so that I can connect new information about psychological disorders with what I already know.

What is your ideal future, and how will achieving this goal benefit your future? Think about where you want to be in 5 years, and how this goal will help your progress towards that ideal future.

e.g. In my ideal future, I will work as an elementary school teacher. Achieving this goal will benefit my future because it will allow me to learn about concepts related to children's speech development.

e.g. In my ideal future, I will be pursuing post-secondary education. Achieving this goal of self-explaining evolutionary psychology for psych 101 will help me understand the topic better, so that I can get a better grade on the exam. High grades are important to me because I want to apply to grad school in the future.

Rate your commitment to this goal you just created:

100% committed…….0% committed

<next page>

5. TIMEFRAME: This goal should be completed within a week. Indicate when and how often will you work on this goal in the coming seven days. If you feel that the goal you have created cannot be completed in a week, please go back and edit it to make it more manageable.

Estimate how many hours completing this goal will take: *e.g. 2 hours*

What day(s) and time(s) will you work on this goal?

e.g. I will work on this goal on Tuesday at 7pm, after I have come home from work and had dinner. If I have not finished by Tuesday 9pm, I will continue working on and finish this goal

on Thursday at 12pm, during my break in between classes.

e.g. For my Psych 101 course this week, I will use self-explanation for the topic of obsessive-compulsive disorders. This goal will take me 2 hours to complete, and I will work on it on Tuesday evening and maybe Thursday afternoon. I will ensure I get enough sleep and understand how self-explanations work so I can complete this goal, because I am very committed to it and am confident I can achieve this goal by next week. By the completion of the goal, I will be able to relate symptoms of OCD to my prior knowledge about the disorder and other related disorders.

Use the following text box to summarize your overall, detailed, goal for this week. Include your topic, action, and timeframe.

After you submit your goal, by latest Tuesday 12pm, you will have the rest of the week to study and work on the actions you said you would complete in your goal.

Next week, you will again receive a link to an ACE IT goal setting template. First, you will be asked some reflection questions about your goal and achievement from this week, and then you will create another ACE IT goal for the week ahead.

Appendix C. Goal Setting Template

You will create a goal each week, using the ACE IT goal template.

ACE IT: Action, Content, Evaluation/Efficacy, Importance, Timeframe.

Use this goal template to complete your goal each week. Make sure to complete all text fields.

ACTION: Go to the study strategy library and choose from one of the study strategies listed.

The study technique I will use this week is: *e.g. self-explanation*

CONTENT: Indicate the course and the specific topic you will create a goal for (e.g., DNA replication; ADHD; The Big Bang Theory, etc.).

My goal for this week is for the course: *e.g. Psych 101*

The topic I want to focus on is: *e.g. personality disorders, specifically the definition and symptoms of obsessive-*

EVALUATION/EFFICACY:

How will you know when you have achieved this goal? What is your desired outcome?

I will know I have achieved this goal when I am able to:

e.g. explain the differences between Vygotsky and Piaget's theories

e.g. An obstacle I might face is that I may not understand how to do self-explanation properly. Another obstacle is that I might be tired after work on Tuesday and not feel like working on this goal.

Write out any obstacles you might face when trying to achieve the goal for this week:

e.g. I will overcome my first obstacle by reading about how self-explanation works in the study techniques catalogue. I will overcome my second obstacle by sleeping early on Monday night so I have enough energy for work and studying on Tuesday. I might take a short 15min. nap after work to gain energy for studying.

How will you overcome your obstacle(s)?

How confident are you in your ability to achieve this goal in the coming week?

Very confident 5……4……...……3……2……1 Not at all confident

IMPORTANCE: Indicate why is this goal important to you.

How is the goal related to your educational or personal values?

e.g. This goal is related to my values because I value hard work and want to put in my best effort for this psych course, so I will try doing self-explanations while I study so that I can connect new information about psychological disorders with what I already know.

What is your ideal future, and how will achieving this goal benefit your future?

e.g. In my ideal future, I will work as an elementary school teacher. Achieving this goal will benefit my future because it will allow me to learn about concepts related to children's speech development. *e.g. In my ideal future, I will be pursuing post-secondary education. Achieving this goal of self-explaining evolutionary psychology for psych 101 will help me understand the topic better, so that I can get a better grade on the exam. High grades are important to me because I want to apply to grad school in the future.*

Rate your commitment to this goal:

100% committed…….0% committed

TIMEFRAME: This goal should be completed within a week. Indicate when and how often will you work on this goal in the coming seven days.

Estimate how many hours completing this goal will take: *e.g. 2 hours*

What day(s) and time(s) will you work on this goal?

I will work on this goal on Tuesday at 7pm, after I have come home from work and had dinner. If I have not finished by Tuesday 9pm, I will continue working on and finish this goal on Thursday at 12pm, during my break in between classes.

Use the following text box to summarize your overall, detailed, goal for this week

e.g. For my Psych 101 course this week, I will use self-explanation for the topic of obsessive compulsive disorders. This goal will take me 2 hours to complete, and I will work on it on Tuesday evening and maybe Thursday afternoon. I will ensure I get enough sleep and understand how self-explanations work so I can complete this goal, because I am very committed to it and am confident I can achieve this goal by next week. By the completion of the goal, I will be able to relate symptoms of OCD to my prior knowledge about the disorder and other related disorders.

Appendix D. Learning Diary

Choose a study strategy to use for one of your courses this week.

Click on this link study strategy library to identify one of the study strategies listed there.

Study Strategy I chose this week: *e.g. self-explanation*

Course I will use it in: *e.g. PSYC 101*

Notes about my studying for the week ahead:

Write about your studying plan for the week ahead, including the study strategy you chose. As an example, a student might include the following kind of information in study notes: time spent studying, days on which you will study, the study strategy you chose to use, the content you study, and what you want to be able to achieve after studying.

Appendix E. Learning Diary Training

Each week, you will create a study plan for the week, and track it in this Learning Diary.

You will be sent the link to this Learning Diary on Saturday each week, and you have three days, from Saturday 12pm to Tuesday 12pm to complete your Learning Diary. Please make sure the form is complete and submitted before Tuesday 12pm, so that you can focus on achieving your goal and studying during the rest of the week.

First, you will go to the study strategy library and browse the different strategy options you have available to you. Each week, you will choose one of these study strategies to use in your studying of course content.

Please take a minute now to go to the study strategy library and explore the different study strategies and how to use them. At the bottom of each study strategy, it asks you to rate your confidence in using that technique or skill. Think about your past studying skills and rate your confidence with using each study strategy.

Go to study strategy library ->

<next page>

Here is what you will see each week:

Choose a study strategy to use for one of your courses this week.

You will click on this link study strategy library to identify one of the study strategies listed there that you want to use this week and type it in the text box provided below.

Study Strategy I chose this week: | *e.g. self-explanation* |

Course I will use it in: *e.g. PSYC 101*

<next page>

Next, you will write some notes about how you are planning to study this week using the study strategy you chose. A student might include the following kind of information in study notes: time spent studying, days on which you will study, the study strategy you chose to use, the content you study, and what you want to be able to achieve after studying.

Write about your studying plan for the week ahead, including the study strategy you chose. Be specific.

Notes about my studying for the week ahead:

After you submit your study plan, by latest Tuesday 12pm, you will have the rest of the week to study and work on the actions you wrote about in your Learning Diary.

When you come back to your Learning Diary the next week (you will again be sent a link on Saturday, that you must complete within 72 hours), you will first reflect on what you did in the past week, and how well it went using the study strategy you chose.

Reflection

Please reflect on the study strategy and study plan you made last week. If a friend asked

Write about using the study strategy in your studying for your course last week. How well did your study plan turn out? Be specific.

you about using the strategy and how well it worked for you, what would you say?

Then you will again choose a study strategy to use for one of your courses for the next week and write some notes about your studying plan.

Appendix F. Weekly Goal Reflection

Q1. Did you achieve your goal from last week?

- **Yes** – I achieved my goal for the week.
- **Somewhat** – I was partly successful in achieving my goal for the week.
- **Undecided** – I am not sure if I achieved my goal for the week.
- **No** – I did not achieve my goal for the week

*Depending on the answer to **Q1 (Yes, Somewhat, Undecided, No),** Q2 varies.*

Q2. Yes: What helped you achieve your goal for the week?

(Check all factors that had a major effect on your goal):

- The course content in my goal was easy for me to study/learn
- The study strategy I chose was easy to use and effective
- I had enough time this week to work on my goal
- I had other obligations outside of academics, but this goal was higher priority for me
- I was very committed to the goal I set for the past week
- Other: _____

Q2. Somewhat: Respond to the questions below:

a) The course content I was working on this week in my goal was easy to study/learn:

1 Strongly Agree……. Strongly Disagree 5

b) The study strategy I chose this week was easy to use:

1 Strongly Agree……. Strongly Disagree 5

c) I had enough time this week to work on my goal

1 Strongly Agree……. Strongly Disagree 5

d) I was very committed to the goal I set for the past week

1 Strongly Agree……. Strongly Disagree 5

Q2. Undecided:

The same items as 'Somewhat'

Q2. No: What made it <u>harder</u> for you to achieve your goal for the week?

(Check all factors that had a major effect on your goal):

- o The course content in my goal was difficult for me to study/learn
- o The study strategy I chose was difficult to use or didn't work for me
- o I ran out of time to work on this goal
- o I had other obligations outside of academics and this goal was lower priority for me
- o I was not very committed to the goal I set for the past week
- o Other: _____

(the rest of the survey is the same for all)

Q3. Setting a goal and making a plan for my learning using the ACE IT goal template motivated me to put more effort towards my goal:

1 Strongly Agree……. Strongly Disagree 5

Q4. Setting a goal and making a plan for my learning motivated me to put more effort towards *all my studying*, not just the content noted in my goal.

1 Strongly Agree……. Strongly Disagree 5

Q5. After this week, I am more confident I can set and achieve my goals

1 Strongly Agree……. Strongly Disagree 5

Q6. Are there any factors that could have made it easier for you to achieve your goal this week?

[text box]

Q7. Any other comments about the goal you set and your achievement in the past week?

[text box]

Appendix G. Weekly Learning Diary Reflection

Reflection

Please reflect on the study strategy and study plan you made last week. If a friend asked you about using the strategy and how well it worked for you, what would you say?

Write about using the study strategy in your studying for your course last week. How well did your study plan turn out? Be specific.

Appendix H. Demographic Questionnaire

1. Age: __
2. Gender: Male __ Female __ Other: _____
3. What is your major? _____
4. Are you a Native English Speaker (is English your first language)?

   Yes / No
5. How many years of your schooling used English as the primary language?
   _____ years
6. Counting this semester, approximately how many credits have you completed at a post-secondary institution (since high school)? ___ credits
7. Are you an undergraduate student or graduate student?
   Undergraduate / Graduate
8. What is your current cGPA? _____
9. How many hours per week do you work or volunteer outside of your academics? ___ hrs.
10. How many classes are you taking this term? ____ classes
11. What year are you in? 1st/2nd/3rd/4th +

Appendix I. Self-regulated Learning (SRL) Questionnaire

Learning Skills Questionnaire:

The following questions ask about your learning strategies and study skills for this class. **Remember there are no right or wrong answers, just answer as accurately as possible.** Use the scale below to answer the questions. If you think the statement is very true of you, circle 7; if a statement is not at all true of you, circle 1. If the statement is more or less true of you, find the number between 1 and 7 that best describes you.

1. When I study the readings for this course, I outline the material to help me organize my thoughts.

   Not at all true of me 1 2 3 4 5 6 7 Very true of me

2. [REVERSED] During class time I often miss important points because I'm thinking of other things.

   Not at all true of me 1 2 3 4 5 6 7 Very true of me

3. I usually study in a place where I can concentrate on my course work.

   Not at all true of me 1 2 3 4 5 6 7 Very true of me

4. When reading for this course, I make up questions to help focus my reading.

   Not at all true of me 1 2 3 4 5 6 7 Very true of me

5. I often find myself questioning things I hear or read in this course to decide if I find them convincing.

   Not at all true of me 1 2 3 4 5 6 7 Very true of me

6. [REVERSED} I often feel so lazy or bored when I study for this class that I quit before I finish what I planned to do.

   Not at all true of me 1 2 3 4 5 6 7 Very true of me

7. When I study for this class, I practice saying the material to myself over and over.

   Not at all true of me 1 2 3 4 5 6 7 Very true of me

8. When a theory, interpretation, or conclusion is presented in class or in the readings, I try to decide if there is good supporting evidence.

   Not at all true of me 1 2 3 4 5 6 7 Very true of me

9. When I become confused about something I'm reading for this class, I go back and try to figure it out.

   Not at all true of me 1 2 3 4 5 6 7 Very true of me

10. When I study for this course, I go through the readings and my class notes and try to find the most important ideas.

    Not at all true of me 1 2 3 4 5 6 7 Very true of me

11. I make good use of my study time for this course.

    Not at all true of me 1 2 3 4 5 6 7 Very true of me

12. If course materials are difficult to understand, I change the way I read the material.

Not at all true of me 1 2 3 4 5 6 7 Very true of me

13. When studying for this class, I read my class notes and the course readings over and over again.

Not at all true of me 1 2 3 4 5 6 7 Very true of me

14. I work hard to do well in this class even if I don't like what we are doing.

Not at all true of me 1 2 3 4 5 6 7 Very true of me

15. I make simple charts, diagrams, or tables to help me organize course material.

Not at all true of me 1 2 3 4 5 6 7 Very true of me

16. I treat the course material as a starting point and try to develop my own ideas about it.

Not at all true of me 1 2 3 4 5 6 7 Very true of me

17. [REVERSED] I find it hard to stick to a study schedule.

Not at all true of me 1 2 3 4 5 6 7 Very true of me

18. When I study for this class, I pull together information from different sources, such as lectures, readings, and discussions.

Not at all true of me 1 2 3 4 5 6 7 Very true of me

19. Before I study new course material thoroughly, I often skim it to see how it is organized.

Not at all true of me 1 2 3 4 5 6 7 Very true of me

20. I ask myself questions to make sure I understand the material I have been studying in this class.

Not at all true of me 1 2 3 4 5 6 7 Very true of me

21. I try to change the way I study in order to fit the course requirements and instructor's teaching style.

Not at all true of me 1 2 3 4 5 6 7 Very true of me

22. [REVERSED] I often find that I have been reading for class but don't know what it was all about.

Not at all true of me 1 2 3 4 5 6 7 Very true of me

23. I memorize key words to remind me of important concepts in this class.

Not at all true of me 1 2 3 4 5 6 7 Very true of me

24. [REVERSED] When course work is difficult, I give up or only study the easy parts.

Not at all true of me 1 2 3 4 5 6 7 Very true of me

25. I try to think through a topic and decide what I am supposed to learn from it rather than just reading it over when studying.

Not at all true of me 1 2 3 4 5 6 7 Very true of me

26. I try to relate ideas in this subject to those in other courses whenever possible.

Not at all true of me 1 2 3 4 5 6 7 Very true of me

27. When I study for this course, I go over my class notes and make an outline of important concepts.

Not at all true of me 1 2 3 4 5 6 7 Very true of me

28. When reading for this class, I try to relate the material to what I already know.

Not at all true of me 1 2 3 4 5 6 7 Very true of me

29. I have a regular place set aside for studying.

Not at all true of me 1 2 3 4 5 6 7 Very true of me

30. I try to play around with ideas of my own related to what I am learning in this course.

Not at all true of me 1 2 3 4 5 6 7 Very true of me

31. When I study for this course, I write brief summaries of the main ideas from the readings and the concepts from the lectures.

Not at all true of me 1 2 3 4 5 6 7 Very true of me

32. I try to understand the material in this class by making connections between the readings and the concepts from the lectures.

Not at all true of me 1 2 3 4 5 6 7 Very true of me

33. I make sure I keep up with the weekly readings and assignments for this course.

Not at all true of me 1 2 3 4 5 6 7 Very true of me

34. Whenever I read or hear an assertion or conclusion in this class, I think about possible alternatives.

Not at all true of me 1 2 3 4 5 6 7 Very true of me

35. I make lists of important terms for this course and memorize the lists.

Not at all true of me 1 2 3 4 5 6 7 Very true of me

36. I attend class regularly.

Not at all true of me 1 2 3 4 5 6 7 Very true of me

37. Even when course materials are dull and uninteresting, I manage to keep working until I finish.

Not at all true of me 1 2 3 4 5 6 7 Very true of me

38. When studying for this course I try to determine which concepts I don't understand well.

Not at all true of me 1 2 3 4 5 6 7 Very true of me

39. [REVERSED] I often find that I don't spend very much time on this course because of other activities.

Not at all true of me 1 2 3 4 5 6 7 Very true of me

40. When I study for this class, I set goals for myself in order to direct my activities in each study period.

Not at all true of me 1 2 3 4 5 6 7 Very true of me

41. If I get confused taking notes in class, I make sure I sort it out afterwards.

Not at all true of me 1 2 3 4 5 6 7 Very true of me

42. [REVERSED] I rarely find time to review my notes or readings before an exam.

Not at all true of me 1 2 3 4 5 6 7 Very true of me

43. I try to apply ideas from course readings in other class activities such as lecture and discussion.

Not at all true of me 1 2 3 4 5 6 7 Very true of me

Appendix J. Student Perceptions of the Goal Setting Task

1. How did using the goal template each week impact your goal setting skills?
   [text box]

2. How did using the goal template each week impact your studying?
   [text box]

3. How did using the goal template each week impact your motivation?
   [text box]

4. The ACE IT template was helpful.

   1 Strongly Agree……. Strongly Disagree 5

5. Learning how to set goals using the ACE IT template was worthwhile.

   1 Strongly Agree……. Strongly Disagree 5

6. The study strategy library contained study techniques I could use in my studying.

   1 Strongly Agree……. Strongly Disagree 5

7. Choosing a study strategy from the library helped me set an action-oriented goal.

   1 Strongly Agree……. Strongly Disagree 5

8. Writing about why my goal was important in the goal template motivated me to achieve the goal.

   1 Strongly Agree……. Strongly Disagree 5

9. Writing about potential obstacles and how I would overcome them helped me to achieve my goals.

   1 Strongly Agree……. Strongly Disagree 5

10. All parts of the ACE IT template were relevant to my goal setting

    1 Strongly Agree……. Strongly Disagree 5

11. If any parts of the ACE IT template – Action, Content, Evaluation/Efficacy, Importance, and Timeframe– were not relevant to you, please explain why.
    [text box]

12. Using the ACE IT template for one goal a week helped motivate me to study harder for my other courses.

    1 Strongly Agree……. Strongly Disagree 5

13. Using the study strategy library for one goal a week helped motivate me to study harder for my other courses.

    1 Strongly Agree……. Strongly Disagree 5

14. Would you continue to use the ACE IT goal setting template in your studying? Please supply a brief explanation.

    Yes / No

15. Would you continue to use the Study Strategy Library in your studying? Please supply a brief explanation.

    Yes / No

Appendix K. Student Perceptions of the Learning Diary Task

1. How did filling out the learning diary each week impact your studying? [text box]

2. How did filling out the learning diary each week impact your motivation? [text box]

3. The Learning Diary was helpful.

   1 Strongly Agree……. Strongly Disagree 5

4. Using the Learning Diary has been a worthwhile use of my time.

   1 Strongly Agree……. Strongly Disagree 5

5. The study strategy library contained study techniques I could use in my studying.

   1 Strongly Agree……. Strongly Disagree 5

6. Using the Learning Diary each week helped motivate me to study harder for my other courses, which I didn't use the learning diary for.

   1 Strongly Agree……. Strongly Disagree 5

7. Using the study strategy library each week helped motivate me to study harder for my other courses, which I didn't use the study strategy library for.

   1 Strongly Agree……. Strongly Disagree 5

8. Would you continue to use the Learning Diary in your studying? Please supply a brief explanation.

   Yes / No

9. Would you continue to use the Study Strategy Library in your studying? Please supply a brief explanation.

   Yes / No

10. Were you aware of another condition in this study?

    Yes / No