# Self-Regulated Strategy Instruction for Basic College Writers:

# Results from a Randomized Experiment

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## Abstract

The paper presents the results of a randomized experimental study of a writing curriculum for college basic writers, which is based on self-regulated strategy instruction. In addition to writing strategies, students learn strategies for self-regulation – goal setting, task management, self-evaluation, and reflection. A prior quasi-experiment (MacArthur, Philippakos, & Ianetta, 2015) found positive effects on writing quality, self-efficacy, and mastery motivation. The current study included 19 instructors and 207 students across two colleges. Using hierarchical linear modeling (HLM) with students nested within instructors and with condition and college as factors and pretest scores as covariates, analysis found positive effects of the treatment for quality of argumentative writing (ES [Glass Δ] = 1.75), quality of writing on an independent writing prompt (ES = .67), several motivation outcomes (self-efficacy for tasks and processes (ES = 0.50), for grammar (ES = 0.40), and self-regulation (ES = 0.40); affect (ES = 0.32); and beliefs about the importance of content (ES = 0.25).

## Introduction

Developmental, or basic, writing courses are common in the USA, especially in two-year community colleges, yet little systematic research has studied instructional interventions in those settings (Levin & Calcagno, 2008; Perin, 2013). In a prior project, we used design research (MacArthur & Philippakos, 2012; 2013) to develop and refine a curriculum based on self-regulated strategy instruction, called Supporting Strategic Writers. A quasi-experiment following the design research found strong positive effects on quality of argumentative writing (Glass's Δ = 1.22) as well as positive effects on self-efficacy and mastery motivation (MacArthur, Philippakos, & Ianetta, 2015). The purpose of this paper is to present results from a randomized control trial (RCT) of the Supporting Strategic Writers curriculum in two community colleges.

Self-regulated strategy instruction has been studied extensively with elementary and secondary students, especially with struggling writers, and has been found to have substantial effects on quality of writing (Graham & Perin, 2007; Graham, Harris, & Chambers, 2016). Two studies have found positive effects of self-regulated strategy instruction in adult education programs (Berry & Mason, 2012; MacArthur & Lembo, 2009), and general self-regulation strategies have been found effective with college students with learning disabilities (Butler, 2003). However, to our knowledge, no prior experimental research has investigated self-regulated strategy instruction with college basic writers.

The curriculum, *Supporting Strategic Writers*, is based on self-regulated strategy instruction (Harris & Graham, 2009). Students learn systematic strategies for planning and revising based on genre elements (Englert et al., 1991). Instruction follows a sequence including introduction to a genre, evaluation of good and weak essays, think-aloud modeling, collaborative writing, individual writing, peer review with careful preparation, and editing, followed by writing a second essay with less support. Instruction includes an emphasis on learning self-evaluation (MacArthur, 2016). In addition, students learn metacognitive, self-regulation strategies for goal setting, task management, monitoring of progress, and reflection. These self-regulation strategies are supported through journal writing and class discussion, as well as through the writing strategies themselves.

## Methods

### Participants

Participants included 19 instructors ($n$ = 10 treatment) from two community colleges in two different states in the eastern United States. Most were white women (13); 4 were white men, and 2 were African-American women. Experience teaching college writing ranged from one year to over 20. Instructors were randomly assigned within college to condition.

Students were invited via informed consent (83% participation). Of the 246 participants with consent, 207 students completed the pretest and posttest assessments (n = 96 control, n = 111 treatment). Seventeen treatment students and 22 control students either dropped the course or did not complete the pretest or posttest. Of the 207 participants, 62% were female, 43% were White/Caucasian, 38% African-American, 4% Asian, 9% Hispanic, 2% Native American, and 5% other; 12% were non-native speakers of English; mean age was 24 years (see Table 1).

### Procedures

Treatment instructors participated in two days of professional development and received coaching during the semester. Control instructors met with the researchers to review the study procedures and proceeded with a business-as-usual control condition.

Instruction was provided for a full semester of a three-credit course. Students in the treatment condition were provided with instruction on the genres of narrative, cause-effect, and argumentation. Instruction in the control classrooms varied but all instructors taught multiple genres including argumentative writing.

### Measures

**Student measures**. At pretest and posttest, students wrote argumentative essays on topics that had been evaluated in previous studies (MacArthur & Philippakos, 2013; MacArthur et al.,

2015). Argument was chosen because of its fundamental importance to academic writing (Wolfe, 2011). Four research assistants independently rated papers for overall quality on a 7-point rubric. Each paper was read by two raters; interrater reliability between pairs was good (range r= .76 to .88).

Also at pretest and posttest, students completed a motivation questionnaire tapping goal orientation, beliefs, self-efficacy, and affect (MacArthur, Philippakos, & Graham, 2015; MacArthur & Philippakos, 2015). Internal consistency reliabilities were adequate, with Cronbach alphas ranging from .73 - .96 except for 'beliefs about grammar' at $\alpha = .64$. Students' scores on college placement tests taken prior to the course (Accuplacer Reading Comprehension and Accuplacer Sentence Skills; College Board, 2016) were collected. Students also completed the Accuplacer Reading at the end of the semester.

As a distal measure unrelated to the specific curriculum, students wrote a posttest essay using a retired 12th-grade prompt from the National Assessment of Educational Progress (NAEP, no date). It was scored for overall quality using the NAEP rubric; independent of the project staff, a consultant with expertise in NAEP scoring trained raters following standard NAEP procedures. All essays were scored by two raters; reliability was good with 65% exact and 96% adjacent agreement, and with $r = .76$.

Interviews were conducted with a sample of students across all sections and conditions to understand their perspectives on their course and thoughts about their learning and instruction.

**Instructor measures**. Treatment instructors were observed by trained graduate research assistants (RAs) at least 3 times during the semester to evaluate treatment fidelity; these observations were in addition to observations for coaching. Observers took detailed field notes and rated instructors using a fidelity of treatment scale that included a checklist of instructional components and a quality ratings. For the checklist, observers coded each component as implemented as intended, implemented with modifications, or omitted. In addition, observers rated the quality of five key components of strategy instruction (e.g., think-aloud modeling) using a 3-point rubric. RAs were trained using video recordings and detailed field notes from prior studies of the same curriculum with criterion fidelity scores from the primary researchers. At the end of training, they independently scored 6 observations (2 video and 4 field notes). Percent exact agreements (item-by-item) with the criterion scores ranged from 84-96% for the checklist items and 67-93% for the quality ratings (all quality disagreements were one point).

Control instructors were observed 3 times by the same RAs to describe their instruction. RAs took detailed field notes, which they used to summarize the main activities and time spent on them. They also used the quality ratings from the fidelity of implementation scale to score any key aspects of the treatment approach to capture any use of strategy instruction by control instructors.

All instructors were interviewed before professional development to gather information on their education and on their prior teaching perspectives and practices, as well as basic demographic information. Treatment instructors were interviewed after the semester to gather information on their perspectives on the curriculum.

## Results

Preliminary analysis of equivalence between treatment and control groups found no significant differences at pretest for Accuplacer reading and writing scores, essay quality, or essay length (all ps > .2). However, a significant pretest difference was found for one motivation factor (out of nine), self-efficacy for grammar ($p < .05$) and a nearly significant difference for affect ($p < .10$), both with higher scores for control classes (see Tables 2 & 3).

**Fidelity of Treatment**

Fidelity of treatment was high. For implementation of lesson components, instructors scored from 1.89 to 1.96 on a 2-point scale (M = 1.94). For quality of implementation of key features, instructors ranged from 2.4 to 3 on a 3-point scale (M = 2.85).

Statistical analyses of posttest quality, length, motivation, and reading were conducted using hierarchical linear modeling (HLM) with students nested within instructors with condition and college as factors and pretest scores on the same measures as covariates. For the NAEP assessment, the pretest essay quality was used as covariate.

**Essay Quality and Length**

For quality, a statistically significant effect of treatment was found ($p < .001$) with a very large effect size (Glass's $\Delta = 1.75$) favoring the treatment group. No interaction was found between condition and site, indicating that the treatment worked equally well in both colleges. For length, no significant effect was found ($p < .3$) (See Table 2).

**NAEP Assessment**

For overall quality on the NAEP assessment, a statistically significant effect of treatment was found ($p < .01$) with a moderate to large effect size (Glass's $\Delta = 0.67$) favoring the treatment group. No significant difference was found between colleges (See Table 2).

**Motivation**

For self-efficacy, statistically significant effects favoring the treatment group were found for all three factors: self-efficacy for tasks and processes ($p < .001$, ES = 0.50), self-efficacy for grammar ($p < .01$, ES = 0.36) and self-efficacy for self-regulation ($p < .01$, ES = 0.40).

Significant positive effects were also found on affect ($p < .01$, ES = 0.32), and on beliefs about importance of content ($p <. 05$, ES = .25). No significant effects were found for goal orientation (mastery, performance, avoidance). (See Table 3 **revise to include goals).

**Accuplacer Reading Posttest**

For the Accuplacer reading, no significant effect of treatment was found ($p > .8$).

**Interviews**

**Instructor interviews.** All treatment instructors gave positive comments on the approach. One of them who was initially cautious about the approach admitted to have changed beliefs after following the curriculum with fidelity and seeing its effects on students' performance. Instructors commented on the organization of the units that provided a systematic and predictable structure to students who could anticipate the content and work. Instructors overall reported that for students who attended the course regularly, they could see the positive effects of the approach.

**Student interviews**. Preliminary findings of the interviews show that participants were likely to identify their teacher as the primary reason for high ratings of the overall effectiveness of the course and most were very positive about their experiences with the course. Within the treatment group, students positively commented on the systematic presentation of the planning strategies that allowed them organize their thoughts before writing. Students also spoke highly of the peer review process in the treatment condition, remarking on the benefits of having others read and critique their work, while students in the control condition were less likely to have found peer review to be beneficial. Several students from the treatment condition mentioned using strategies from the approach to write for other classes.

## Discussion

This study was the first randomized control trial (RCT) of self-regulated strategy instruction with college developmental writers. The instructional approach included systematic strategies for using knowledge about the elements of multiple genres to plan, draft, evaluate, and revise essays. Instruction included modeling of writing strategies, collaborative application of the strategies by instructors and students, and gradual release of responsibility. In addition, it included key self-regulation strategies, engaging students in goal setting, strategy selection, progress monitoring, and reflection.

The study found a large positive effect on the quality of student writing (ES = 1.75) on a final examination. The results were supported by positive results on an independent measure of quality of persuasive writing from the NAEP (ES = 0.67). No interaction effects were found for college, indicating that the treatment worked at both sites. In addition, the study found positive effects for all three aspects of self-efficacy that were measured as well as affect and beliefs about writing with small to moderate effect sizes. No significant effect was found on reading comprehension using a distal measure. Both instructors and students made positive comments about the curriculum in interviews.

The results are similar to an earlier quasi-experiment using a similar curriculum (MacArthur et al., 2015). That study found positive effects on overall quality (ES = 1.22) and self-efficacy. The prior study found a positive effect on mastery motivation, while the current study found positive effects on writing beliefs (increased focus on content) and affect.

From a practical perspective, the study addresses the needs of a large population of struggling writers. Unfortunately, large numbers of high-school graduates and older adult students begin postsecondary education without adequate writing skills and are required to take developmental or remedial writing courses (NCES, 2013).

Further research is needed to investigate the effects of strategy instruction in developmental writing courses that include a focus on writing from sources and the consequent need for improved reading comprehension and critical reading.

Table 1

*Demographics of Student Participants*

| | | Treatment | Control | Total |
|---|---|---|---|---|
| Gender | Female | 66 | 62 | 126 |
| | Male | 44 | 34 | 78 |
| Ethnicity | African-American | 47 | 32 | 79 |
| | Asian-American | 5 | 3 | 8 |
| | Caucasian | 45 | 44 | 89 |
| | Hispanic | 10 | 9 | 19 |
| | Native American | 1 | 1 | 2 |
| | Other | 3 | 7 | 10 |
| Native English Speakers | | 97 | 86 | 183 |
| Non-Native Speakers | | 14 | 10 | 24 |
| Age – Mean (SD) | | 24.8 (9.5) | 22.6 (8.5) | 23.8 (9.1) |

Table 2

*Achievement Outcomes: Essay Quality and Length, NAEP Writing Quality, Accuplacer Reading*

| | | Treatment M (SD) | Control M (SD) |
|---|---|---|---|
| Quality | | | |
| | Pretest | 2.4 (0.9) | 2.6 (0.76) |
| | Posttest | 4.4 (1.0) *** | 3.1 (1.1) |
| | Gain | 2.0 | 0.5 |
| Length | | | |
| | Pretest | 237 (114) | 241 (94) |
| | Posttest | 471 (127) | 436 (174) |
| | Gain | 234 | 195 |
| NAEP Quality | Posttest only | 3.21 (0.94)** | 2.76 (0.84) |
| Accuplacer Reading | | | |
| | Pretest | 102.9 (43.2) | 106.8 (41.1) |
| | Posttest | 112.7 (28.3) | 118.0 (36.0) |

Note: Quality was rated on a 7-point rubric. Length is the total number of words. NAEP Quality was rated on the 6-point NAEP rubric.

*** $p < .001$; ** $p < .01$; Quality ES (Glass $\Delta$) = 1.75; NAEP Quality ES (Glass $\Delta$) = 0.67

Table 3

*Motivation Outcomes: Self-Efficacy, Beliefs about Writing, and Affect*

| | Treatment | | Control | |
|---|---|---|---|---|
| | Pre | Post | Pre | Post |
| Self-efficacy (SE) | | | | |
| SE Task/process | 60.1 (17.9) | 76.1*** (15.1) | 63.9 (17.2) | 69.3 (17.3) |
| SE grammar | 50.6 (18.8) | 65.4** (17.2) | 57.5 (20.3) | 63.4 (65.4) |
| SE self-regulation | 64.5 (16.8) | 76.1** (13.9) | 68.7 (15.9) | 71.7 (16.7) |
| Beliefs | | | | |
| Substance | 3.8 (0.6) | 4.2* (1.0) | 4.0 (0.6) | 4.0 (0.7) |
| Mechanics | 2.7 (0.7) | 2.6 (0.9) | 2.8 (0.8) | 2.8 (0.8) |
| Goals | | | | |
| Mastery | 4.07 (0.67) | 4.06 (0.67) | 4.00 (0.67) | 4.02 (0.67) |
| Performance | 2.80 (1.03) | 2.93 (1.19) | 2.82 (1.09) | 3.04 (1.14) |
| Avoidance | 2.74 (1.13) | 2.63 (1.11) | 2.92 (1.04) | 2.80 (0.93) |
| Affect | 3.1 (0.9) | 3.3** (0.8) | 3.3 (0.8) | 3.2 (0.9) |

*** $p < .001$; ** $p < .01$; * $p < .05$

## References


Berry, A. B., & Mason, L. H. (2012). The effects of self-regulated strategy development on the writing of expository essays for adults with written expression difficulties: Preparing for the GED. *Remedial and Special Education, 33*, 124-136.

Butler, D. L. (2003). Structuring instruction to promote self-regulated learning by adolescents and adults with learning disabilities. *Exceptionality, 11*, 39-60.

College Board. (2016, Oct.). *Accuplacer program manual*. New York: College Board.

Graham, S., Harris, K., & Chambers, A. B. (2016). Evidence-based practice and writing instruction: A review of reviews. In C. MacArthur, S. Graham, & J. Fitzgerald (Eds.), *Handbook of writing research* (2nd ed., pp. 211-226). New York: Guilford.

Graham, S., & Perin, D. (2007). A meta-analysis of writing instruction for adolescent students. *Journal of Educational Psychology, 99*, 445-476.

Harris, K. R., & Graham, S. (2009). Self-regulated strategy development in writing: Premises, evolution, and the future. *British Journal of Educational Psychology Monograph Series II, 6*, 113-135.

Levin, H. M., & Calcagno, J. C. (2008). Remediation in the community college: An evaluator's perspective. *Community College Review, 35*, 181-207.

MacArthur, C. A., & Philippakos, Z. A. (2012). Strategy instruction with college basic writers: A design study. In Gelati, C., Arfé, B., & Mason, L. (Eds.), *Issues in writing research* (pp. 87-106). Padova: CLEUP.

MacArthur, C. A., & Philippakos, Z. A. (2013). Self-regulated strategy instruction in developmental writing: A design research project. *Community College Review*, 41, 176-195. DOI: http://dx.doi.org/10.1177/0091552113484580

MacArthur, C. A., & Philippakos, Z. A. (2015, Feb.). *Developing a measure of motivation for first-year college writers.* Paper presented at the annual Pacific Coast Research Conference, San Diego, CA.

MacArthur, C. A., Philippakos, Z. A., & Ianetta, M. (2015). Self-regulated strategy instruction in college developmental writing. *Journal of Educational Psychology*. 107, 855-867. doi:10.1037/edu0000011.

MacArthur, C. A., Philippakos, Z. A., & Graham, S. (2015). A multi-component measure of writing motivation with basic college writers. *Learning Disability Quarterly*, *39,* 31-43. DOI: 10.1177/0731948715583115.

National Assessment of Educational Progress. (no date). NAEP Questions Tool. Persuasive writing prompt, grade 12, 2011. Retrieved: https://nces.ed.gov/NationsReportCard/nqt

National Center for Education Statistics. (2013). *2011-12 National Postsecondary Student Aid Study* (NPSAS:12). Washington, DC: NCES, Institute for Education Sciences, U.S. Department of Education. Retrieved 12-10-13 from http://nces.ed.gov/datalab/tableslibrary/viewtable.aspx?tableid=9420

Perin, D. (2013). Literacy skills among academically underprepared students. *Community College Review, 41,* 118-136.

Wolfe, C. R. (2011). Argumentation across the curriculum. *Written Communication, 28*, 193-219.