

Using the nonregulatory ESSA standards to assess the level of evidence in Schunk (1996)

Date: January 17, 2018

To: Greg Keith, Minnesota Department of Education, and Robin Kroyer-Kubicek, Wisconsin Department of Public Instruction

From: REL Midwest

Re: Schunk, D. H. (1996). Goal and self-evaluative influences during children’s cognitive skill learning. *American Educational Research Journal*, 33(2), 359–382.

The purpose of this memo is to present findings from an evidence review conducted by Regional Educational Laboratory (REL) Midwest. The Minnesota Department of Education (MDE) and Wisconsin Department of Public Instruction (WDPI) requested assistance from the Regional Deeper Learning Initiative to assess the evidence base for student goal setting. The Deeper Learning Initiative in partnership with REL Midwest conducted scans and identified research studies to be reviewed to assess levels of evidence using the nonregulatory Every Student Succeeds Act (ESSA) standards. The following sections provide further context on the origins of this request.

Theory of Action

Research suggests that goal setting is part of a dynamic and iterative cycle of self-regulated learning (Schunk, 1990). Although research reviews and sources suggest that the act of goal setting can lead to positive outcomes, including enhanced self-efficacy, intrinsic motivation, and job or academic performance, the effectiveness of the student goal setting is mediated by the goal orientation adopted by the learner, the nature and types of goals set, and the actions and behaviors associated with goal-setting practice such as self-evaluation (Latham & Locke, 2007). Research suggests that the goal orientation of the learner is malleable through varying interventions and classroom conditions.

Background on Request

In April 2017, staff from the Great Lakes Comprehensive Center and the Midwest Comprehensive Center’s Deeper Learning Initiative met with MDE and WDPI to discuss their interest in exploring the evidence base for practices believed to be associated with deeper learning outcomes. Representatives from both state agencies identified three practice areas of interest: goal setting, student academic and career advising, and collaborative learning, with the primary focus on goal setting. Deeper Learning staff then worked with the Ask a REL staff from REL Midwest to specify a research question and search parameters.

The REL scan used the search term “student goal setting” and focused on the following question:

- What does the research say about the relationship between student goal setting in grades 6–12 related to academic and career planning and academic and deeper learning outcomes?

The scan was conducted in June 2017 in ERIC and Google Scholar. After only two research sources related to goal setting were identified, Deeper Learning staff expanded the time frame in ERIC and Google Scholar to include the past 20 years of publications. The search terms were expanded to include “personal goal setting,” “self-concordant goals,” “academic goal setting,” “goal orientation,” and “mastery/performance goals.”

According to the nonregulatory ESSA standards, the findings of the study by Schunk (1996) provide promising evidence (Tier III) for goal-setting interventions.

- **Intervention examined in the study.** Providing children with a learning goal (versus a performance goal) with (versus without) opportunities for self-evaluation.
- **Your specified outcome(s) of interest.** Academic achievement and social-emotional development and behavioral outcomes (for example, intrinsic motivation, self-efficacy, and self-regulated learning).
- **Your specified population(s) of interest.** Students in grades 6–12.
- **Your specified setting(s) of interest.** Schools in the United States.

Why Schunk’s (1996) study provides promising evidence for the intervention according to the nonregulatory ESSA standards. REL Midwest determined that Schunk’s (1996) study provides promising evidence for the interventions because the study meets the following criteria:

- The two studies in Schunk’s (1996) review had a combined sample size of only 84 students; hence, the study does not meet the sample size requirement for an evidence tier above promising as specified in the nonregulatory ESSA standards.¹
- Schunk’s (1996) report focused on findings from two independent, well-designed, and well-implemented experimental studies examining the effectiveness of learning goals and performance goals. Learning goals refer to “what knowledge and skills students are to acquire” (p. 361), and performance goals refer to “what tasks students are to complete” (p. 361). For each study, students were assigned randomly to different experimental conditions.
- Study 1 found statistically significant and favorable effects of goal-oriented teaching approaches on the outcomes of academic achievement (math achievement) and social-emotional development and behavior (including self-efficacy, persistence, task goal orientation, and ego goal orientation). These goal-oriented teaching approaches consisted of providing students with a *learning* goal—with or without opportunities to assess their own capabilities and providing students with a *performance* goal with or without

¹ The two studies, which employ experimental design, are not eligible for a What Work’s Clearinghouse review because the publication is more than 20 years old (What Works Clearinghouse, 2014).

opportunities for self-evaluation. Study 2 found a statistically significant and favorable effect of combining a learning goal with self-evaluation versus combining a performance goal with self-evaluation on students' math achievement, self-efficacy, task goal orientation, and ego goal orientation.

- Although the two studies examined a large number of outcome measures, the findings on impacts of the interventions on the outcome measures of academic achievement, social-emotional development, and behavior remain statistically significant and favorable after using a statistical adjustment to reduce the likelihood of finding a significant result by chance when making multiple comparisons.
- The favorable effects are not overridden by any statistically significant, unfavorable effects of the interventions found either in this study or any other identified at the same time for review.
- Both studies were based on samples that overlapped with the population and educational setting of interest for this evidence review.

The completed evidence template used for REL Midwest's review of Schunk's (1996) study is in the appendix of this memo.

Brief description of the interventions tested by Schunk (1996). The report conducted by Schunk (1996) included two studies. In study 1, students were assigned randomly to one of four experimental conditions: learning goal with self-evaluation (LG-SE), learning goal without self-evaluation (LG-NoSE), performance goal with self-evaluation (PG-SE), and performance goal without self-evaluation (PG-NoSE). Students in all conditions received 45-minute instructional sessions over 7 days. At the start of each session, the teacher gave the goal instructions appropriate for students' condition. For students assigned to the LG-SE and LG-NoSE conditions, the teacher stressed the session goal of learning to solve problems rather than simply solving them. For students assigned to the PG-SE and PG-NoSE conditions, the teacher provided a session goal that did not explicitly mention learning. Students assigned to the LG-SE and PG-SE conditions judged their own fraction capabilities at the end of each of the first six sessions but not at the end of the seventh (review) session. Students assigned to the LG-NoSE and PG-NoSE conditions did not engage in end-of-session self-evaluation; rather, they completed an attitude questionnaire at the end of each of the first six sessions to control for potential effects of making judgments. Students in all conditions received the same amount and type of instruction and problem solving.

In study 2, children were randomly assigned to an LG or PG condition, but all students received the opportunity for self-evaluation. The goal instructions for the two conditions were the same as those in study 1, but students' self-evaluation data were collected only once in study 1 (near the end of the instructional program) rather than six times as in study 2 (after each session).

Who participated in the study. Study 1 in Schunk's (1996) report examined 44 fourth-grade students drawn from two classes in one elementary school. The sample included 18 girls (41 percent) and 26 boys (59 percent), ranging in age from 9 years and 1 month to 10 years and 10 months. Twenty-four students (55 percent) were White and the rest were African American students. Study 2 examines 40 fourth-grade students drawn from two classes in one elementary

school. The sample included equal number of boys and girls, ranging in age from 9 years and 1 month to 11 years and 1 month. Twenty-one students (53 percent) were White and the rest were African American students. In both studies, randomization was done at the student level. Participating students received mathematics instruction in regular classes and school personnel considered them to be average achievers.

What the study found. In study 1, students assigned to the LG-SE, LG-NoSE, and PG-SE conditions did not differ significantly, but each scored significantly higher than students in the PG-NoSE condition on measures of self-efficacy, mathematics skill, and task goal orientation and significantly lower on ego goal orientation. The LG-SE students had significantly higher scores on the persistence measure than did the PG-NoSE students. In study 2, the LG students scored significantly higher than the PG students on measures of mathematics skill, self-efficacy, and task goal orientation, whereas the PG students scored higher on ego goal orientation and work avoidant orientation.

How REL Midwest reviewed this study. REL Midwest reviewed Schunk’s (1996) study using an evidence template (see the appendix of this memo) based on the nonregulatory guidance from the U.S. Department of Education (2016). This review is based only on the four studies identified by MDE and WDPI and a search of the What Works Clearinghouse for any existing reviews of studies on the impact of goal setting on student outcomes. This memo does not consider additional research evidence for the impact of goal setting outside of these sources.

Additional information. In addition to Schunk’s (1996) study, REL Midwest reviewed three other studies on goal setting identified by MDE and WDPI: Moeller, Theiler, and Wu (2012); Murayama and Elliot (2009); and Morisano, Hirsh, Peterson, Pihl, and Shore (2010). REL Midwest determined that none of these studies provided evidence aligned with the ESSA evidence tiers because they were not based on samples and settings of interest to this review, as explained next.

- **Moeller et al. (2012).** This correlational study examined the relationship between the LinguaFolio goal-setting process and proficiency in reading, writing, and speaking in Spanish. The authors analyzed 5 years of data on teachers and students using hierarchical linear models that account for the clustering of assessments within students and students within teachers. However, the authors did not include statistical controls for selection bias in their modeling of these relationships. Thus, this study does not meet the ESSA standards for promising evidence that correlational studies may provide.
- **Murayama & Elliot (2009).** This correlational study examined the joint influence of personal achievement goals and classroom goal structures on intrinsic motivation and academic self-concept in mathematics. However, the sample for this study included 1,578 Japanese junior high and high school students, which falls outside the setting of interest and is ineligible for review against ESSA evidence standards.
- **Morisano et al. (2010).** This experimental study used a sample that included 85 undergraduate students, which is outside the grade range of interest for this review (that is, K–12) and was drawn from a Canadian university, a setting not relevant to this review. Thus, this study is ineligible for review against ESSA evidence standards.

Appendix

Template for using What Works Clearinghouse (WWC) standards to assess the level of evidence provided by a study or report

(Version 2.1, 13 February 2017--for use by WWC-certified reviewers)

ED *contract* supporting review:

REL Midwest

Review number for tracking purposes:

Stakeholder requesting the assessment of evidence or submitting evidence for review:

Greg Keith, Minnesota Department of Education, and Robin Kroyer-Kubicek, Wisconsin Department of Public Instruction

Relevant outcome(s) of interest to the stakeholder:

Academic metrics: academic core knowledge, academic skills, academic proficiency, college and career readiness, and graduation rates. Deeper learning and employability skills: critical thinking, problem solving, decision making, collaboration, teamwork, communication, planning, self-management, work habits, self-regulated learning, initiative, motivation, growth mind-set, perseverance, creativity, and adaptability.

Target *population(s)* of interest to the stakeholder:

Students in grades 6–12.

Education *setting(s)* of interest to stakeholder:

General educational setting.

Intervention(s) or *practice(s)* of interest to the stakeholder (if specified—else leave blank):

Student goal setting, self-concordant goal setting, student-owned or student-driven goal setting, personal goal setting, personal or personalized goal setting, and college and career goal setting.

Study or report specified by the stakeholder or from a literature search (use a separate template for each): Schunk, D. H. (1996). Goal and self-evaluative influences during children's cognitive skill learning. *American Educational Research Journal*, 33(2), 359–382.

Relevant finding(s) or *practice recommendation(s)* from the study or report (if specified—else leave blank):

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
1. Does the study or report include at least one outcome of interest to the stakeholder, <u>and</u> that is included in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examines the effect of learning and performance goals on mathematics skill (p. 365).
2. Does the study or report include an intervention or practice of interest to the stakeholder or that is designed to affect an outcome in (1), <u>and</u> that is shown in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examines the effectiveness of setting learning goals and performance goals (p. 366).
3. Is the study or report one of the following: (a) a practice guide prepared by the WWC reporting a “moderate” evidence base or a “strong” evidence base for a recommendation on a practice in (2); <u>or</u> (b) an intervention report prepared by the WWC reporting a “potentially positive” effect or a “positive” effect of an intervention in (2) on a relevant outcome in (1); <u>or</u> (c) a study or report investigating the impact of an intervention or practice in (2) on a relevant outcome in (1) that (i) uses <i>either</i> an experimental design eligible for the highest WWC rating (i.e., a randomized controlled trial [RCT], regression discontinuity design [RDD], or single-case design [SCD]), <i>or</i> a quasi-experimental design [QED], <i>or</i> a correlational design comparing outcomes for an intervention group and a comparison group and using statistical controls for selection bias; <u>and</u> (ii) reports a statistically significant and positive (i.e., favorable) impact of the intervention in (2) on at least one relevant outcome in (1)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Schunk (1996) reported on two studies investigating the impact of two different types of goal-setting strategies (learning goals and performance goals) paired with and without self-evaluation on the outcomes of self-efficacy, mathematics skills, persistence, task goal orientation, ego goal orientation, affiliative orientation, and work avoidant orientation (p. 369). The studies both used a randomized controlled trial. Study 1 assigned students to one of four conditions, and study 2 assigned students to one of two conditions. Both studies reported statistically significant and positive impacts of the learning goal intervention on several outcomes. In study 1, self-efficacy, mathematics skill, and task goal orientation were significantly higher for students in both learning goal conditions and performance goal with self-evaluation condition than in the performance goal without self-evaluation condition (pp. 368–370). In study 2, significant favorable effects of the learning goal condition were found on measures of mathematics skill, self-efficacy, and task goal orientation (pp. 374–376).

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
<p>4. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified at the same time for review on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (3) that remains and is <u>not</u> overridden by any unfavorable results?¹</p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<p>The goal orientation measure consisted of four subscales: task, ego, affiliative, and work avoidant (p. 365).</p> <p>In both studies, the learning goal conditions had significantly negative associations with ego orientation (p. 370 for study 1 and p. 376 for study 2). Although this finding may override the favorable results for goal orientation, it would not override the favorable results for self-efficacy, mathematics skill, or persistence. Additionally, the reviewers found no overriding unfavorable results among causal studies reviewed by the What Works Clearinghouse.</p>
<p>5. Is the study or report one of the following:</p> <p>(a) a practice guide prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “moderate” evidence base or a “strong” evidence base for a recommendation on a practice in (2); <u>or</u></p> <p>(b) an intervention report prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “potentially positive” effect or a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u></p> <p>(c) an experimental [RCT, RDD, or SCD] study or quasi-experimental design [QED] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the WWC <i>Handbook</i>, or on the basis of your <i>own</i> study review using Version 3.0 of the WWC <i>Handbook</i>²—</p>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<p>Schunk’s (1996) is experimental but is ineligible for What Works Clearinghouse review because of the date of the study. WWC reviews typically include studies no older than 20 years. There is no review protocol for this topic, and if a review for this topic began now, this study would fall outside that time frame.</p> <p>The study does investigate the impact of an intervention on a relevant outcome and meets criteria for 5(c)(ii); however, the sample size and location do not meet the large sample size criteria. The pooled sample size for studies 1 and 2 was $n = 84$. This sample falls short of $n = 350$, which is the cut point definition for a large sample.</p>

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
<p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards with Reservations</i> or <i>Meets What Works Clearinghouse Standards without Reservations</i>; <u>and</u></p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the <i>WWC Handbook</i>; <u>and</u></p> <p>(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample?³</p>		
<p>6. Is at least one relevant finding or practice recommendation satisfying (5) based on a sample that overlaps with a target population <u>or</u> an education setting specified by the stakeholder?</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No	
<p>7. Taking into account any statistically significant and negative (i.e. unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the <i>WWC Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (6) that remains and is <u>not</u> overridden by any unfavorable results?¹</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No	
<p>8. Is the study or report one of the following: (a) a practice guide prepared by the WWC using Version 2.1 or higher of the <i>WWC Handbook</i> reporting a “strong” evidence base for a recommendation on a practice in (2); <u>or</u> (b) an intervention report prepared by the WWC using Version 2.1 or higher of the <i>WWC Handbook</i> reporting a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u></p>	<input type="checkbox"/> Yes <input type="checkbox"/> No	

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
<p>(c) an experimental [RCT, RDD, or SCD] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the WWC <i>Handbook</i>, or on the basis of your own study review using Version 3.0 of the WWC <i>Handbook</i>²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards without Reservations</i>; <u>and</u></p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the WWC <i>Handbook</i>; <u>and</u></p> <p>(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample?³</p>		
<p>9. Is at least one of relevant finding or practice recommendation satisfying (8) based on a sample that that overlaps with a target population <u>and</u> an education setting specified by the stakeholder?</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No	
<p>10. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (9) that remains and is <u>not</u> overridden by any unfavorable results?¹</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No	
<p>Mark the highest level of evidence provided by this study or report for the intervention or practice of interest:</p> <p><input type="checkbox"/> <i>Demonstrates a Rationale</i> (1 and 2 must be “Yes”)</p> <p><input checked="" type="checkbox"/> <i>Promising Evidence</i> (1 through 4 must be “Yes”)</p> <p><input type="checkbox"/> <i>Moderate Evidence</i> (1 through 7 must be “Yes”)</p> <p><input type="checkbox"/> <i>Strong Evidence</i> (1 through 10 must be “Yes”)</p>		

Notes

¹ **(Requirements 4, 7, and 10.)** To see whether any favorable findings of a study or report are overridden by statistically significant and unfavorable findings, consult, in addition to the study or studies or report(s) identified for review, the WWC reviews reported at <https://ies.ed.gov/ncee/wwc/FWW>, <https://ies.ed.gov/ncee/wwc/Publication>, and <https://ies.ed.gov/ncee/wwc/ReviewedStudies>. Focus only on outcomes relevant to the stakeholder. Unless otherwise specified for the purpose of the review, assume the following: If the number of relevant outcomes with statistically significant and *favorable* impacts reviewed and confirmed by you or reported by the WWC is *greater than or equal to* the number of relevant outcomes with statistically significant and *unfavorable* impacts, then the favorable result from the study or report identified for review is *not* overridden. Note in your justification the source of any information on possibly overriding findings: either reported findings from the study itself and any related study identified for review at the same time and on the *same* intervention or practice (for requirement 4); or a review using WWC standards to assess the study and any related study identified for review at the same time on the *same* intervention or practice (for requirements 7 and 10); or a systematic review of evidence reported by the WWC for the *same* intervention or practice (for requirements 4, 7, and 10).

² **(Requirements 5[c] and 8[c].)** To examine whether a single study’s relevant findings have been reviewed previously under Version 2.1 or higher of the *WWC Handbook*, consult <https://ies.ed.gov/ncee/wwc/ReviewedStudies>. If a new assessment using WWC standards is required for a specific study finding, then complete a Study Review Guide using the most recent *WWC Handbook* (Version 3.0), *Reviewer Guidance*, and *Review of Individual Studies Protocol*, which are available at <https://ies.ed.gov/ncee/wwc/Handbooks>. Note in your justification which conclusions are based on your own study review, as opposed to information reported on the WWC website for a single study review.

³ **(Requirements 5[c][iii] and 8[c][iii].)** *Large sample* means at least 350 individuals in the analytic sample for a relevant finding satisfying the preceding requirements. For cluster design studies, note in the justification the number of clusters—such as schools, teachers, or classrooms—and the total number of individuals included in a relevant finding (guidance released by the U.S. Department of Education in September 2016 recommended that there be at least 50 clusters, and 500 individuals in a relevant finding from such a study). *Multi-site* sample includes more than one state, school district, or locality (where “locality” can refer to a county, city, or postsecondary campus). “Yes” can be checked if the study under review plus another study identified for review at the same time and on the *same* intervention or practice *together* satisfy the large sample requirement and the multi-site sample requirement, *provided* each study under review also satisfies the *preceding* requirements on the checklist (that is, 1-5[c][ii], or 1-8[c][ii]). If an additional study is needed to satisfy the large sample requirement or the multi-site sample requirement, and that study was also identified for review on the *same* intervention or practice, then include in your justifications cross-references to the review numbers for the related studies.

References

The review included the following four studies on student goal setting:

- Moeller, A. Theiler, J., & Wu, C. (2012). Goal setting and student achievement: A longitudinal study. *Modern Language Journal*, 96(2), 153–169. <https://eric.ed.gov/?id=EJ975683>
- Murayama, K., & Elliot, A. J. (2009). The joint influence of personal achievement goals and classroom goal structures on achievement-relevant outcomes. *Journal of Educational Psychology*, 101(2), 432–447. <https://eric.ed.gov/?id=EJ835043>
- Morisano, D., Hirsh, J. B., Peterson, J. B., Pihl, R. O., & Shore, B. M. (2010). Setting, elaborating, and reflecting on personal goals improves academic performance. *Journal of Applied Psychology*, 95(2), 255–264.
- Schunk, D. H. (1996). Goal and self-evaluative influences during children’s cognitive skill learning. *American Educational Research Journal*, 33(2), 359–382.

Latham, G. P., & Locke, E. A. (2007). New developments in and directions for goal-setting research. *European Psychologist*, 12(4), 290–300.

Schunk, D. H. (1990). Goal setting and self-efficacy during self-regulated learning. *Educational Psychologist*, 25, 71-86.

U.S. Department of Education. (2016). *Non-regulatory guidance: Using evidence to strengthen education investments*. Washington, DC: Author. Retrieved October 13, 2017, from <https://www2.ed.gov/policy/elsec/leg/essa/guidanceuseinvestment.pdf>.

What Works Clearinghouse. (2014). *Procedures and standards handbook (Version 3.0)*. Retrieved October 13, 2017, from https://ies.ed.gov/ncee/wwc/Docs/referenceresources/wwc_procedures_v3_0_standards_handbook.pdf.