The Last Word:

An Interview With Barry J. Zimmerman: Achieving Self-Fulfilling Cycles of Academic Self-Regulation

Héfer Bembenutty
Queens College of the City University of New York

Initial Interest in Education Psychology

JAA: How did your home socialization affect the direction of your professional work?

Zimmerman: I grew up in a small Wisconsin town of approximately 6,000 inhabitants. My father was a teacher, my mother was a nurse, and I had a younger brother. My parents believed strongly in the importance of dedication, self-reliance, and "hard work." For example, although my father had no formal training in carpentry, he and my mother played a major role in building their home in the late 1940s. As a 6-year-old, I remember learning vicariously to use tools, such as a hammer and saw, but my efforts to emulate my father often came up a bit short. My dad exercised great patience showing me where I could nail productively. Eventually, my brother and I decided to build a fort out of packing materials—much to my dad's relief! My parents accepted this challenge of building their own home with full confidence that they would succeed. The impact on me was profound: I saw that barriers could be surmounted with a strong sense of efficacy and goal commitment.

JAA: Did you have any teacher who influenced your learning experience and development in any particular way?

Zimmerman: I have recently written about my father as the most influential teacher in my life (Zimmerman, 2008b). He educated me both informally at home as well as formally in school. He had been a professional musician, and he taught me to play the trumpet informally so that I could participate in the band. He instructed me formally in American history in the seventh grade and English in the 10th and 11th grades. My father employed similar instructional processes in English, history, and music. He used modeling as a key method for teaching skills, such as how to play difficult passages in a musical score on the trumpet or how to diagram a complex sentence to understand its deeper meaning. He viewed his pedagogical approach as emphasizing "basics" or fundamental skills. In teaching me to play the trumpet, he fostered such basics as the quality of my tone, accuracy of my fingering, and precision in my reading of the music. In my father's English classes, the basics involved vocabulary, grammar, and writing skills. For example, he gave weekly spelling tests, not just to avoid common spelling errors but to expand his students' vocabulary. Spelling was not usually part of the curriculum at most high schools, but my father felt that vocabulary growth was important to personal success in life, especially if the students planned to attend college. He viewed vocabulary building as an important form of self-education, and to encourage it, he periodically assigned crossword puzzles to his students. My father set high standards for his students, and he dedicated himself to their attainment.

JAA: As you have pursued your education, who have been your role models?

Zimmerman: In addition to my father, four other individuals had a significant influence on my thinking and development. The first such model was my mentor at the University of Arizona, John Bergan. Jack was an ideal scholar—a thoughtful man who

impressed me with his awareness of the latest research literature and with the rigor of his scientific analysis (Zimmerman, 1996). He showed me how to develop psychometric scales, to apply statistics, and to build conceptual models. Like my father, Jack stood out because of his great respect for our discipline and to the scholarship on which it rested. From our many interactions, I developed a sense of the broad scope and personal advantages of an academic career in educational psychology. Jack would later receive the highest award at the American Educational Research Association (AERA) for the quality of his research.

The second person whose influence on me was profound was Albert Bandura. Al's work was largely unknown in educational circles when I was in graduate school. A classmate who knew of my strong interests in social learning recommended Al to me. I took his advice and began reading Bandura and Walters' (1963) book on *Social Learning and Personality Development*. By the end of the first chapter, I realized that modeling could be studied as a powerful method of teaching and that it was similar to methods that my father had used. Teaching was a "hot" issue in educational psychology at the time, and Bandura's social learning theory offered a unique perspective on that topic. I was introduced to Al early in my career and came to know him personally as well as professionally. I found him to be a warm and encouraging man with a wonderful sense of humor. He invited me and my colleagues to contribute to books that he edited (e.g., Rosenthal, Zimmerman, & Durning, 1971), and he has been very supportive throughout my career. As a visiting professor at Stanford University, I spent a sabbatical leave conducting research with Al, and we jointly published several studies that focused on links between self-efficacy and self-regulation (Zimmerman & Bandura, 1994; Zimmerman, Bandura, & Martinez-Pons, 1992). I have had the pleasure of writing several biographies describing Al's extraordinary contributions to the field of education (Zimmerman, 2008a; Zimmerman & Schunk, 2002).

A third major influence on my professional development was Ted Rosenthal. After graduation from the University of Arizona, I accepted a position at that institution in educational psychology. Ted

joined the faculty in clinical psychology at the same time. He had been a student of Al Bandura's, and we met because we were both affiliated with an early childhood research center that was directed by an enlightened leader named Ron Henderson. Although modeling had been studied primarily with aggression and simple motoric responses, Ted and I became intrigued with the question of whether modeling procedures could be used to teach children to form abstract concepts or rules. We discovered to our immense satisfaction that even preschool children could induce abstract concepts from the activities of skilled models, such as peers, older siblings, or adults. These findings suggested to us that many important forms of human knowledge could be acquired by observing and emulating the behavior patterns and underlying abstractions of competent others. We began a program of research that eventually led to a book that we entitled *Social Learning and Cognition* (Rosenthal & Zimmerman, 1978). Although our career paths parted after we left the University of Arizona, we remained close personal friends for 2 decades until Ted's untimely death. I greatly miss his generous spirit, keen insights, and irreverent humor.

A fourth major influence on me is Dale Schunk. I became acquainted with Dale because of his research with Al Bandura on self-efficacy, and I decided to look him up at an annual meeting of the AERA. I was delighted to have found an educational psychologist whose theoretical interests and view of the importance of research were so compatible with mine. Our theoretical convergence, and the personal friendship that ensued, enabled us to work closely together for more than 2 decades to present a social cognitive perspective to educational psychologists on a topic of mutual interest: self-regulation of learning (SRL). In a series of books that we organized and edited, we solicited chapters by researchers from diverse theoretical orientations on the topic of SRL (Schunk & Zimmerman, 1994, 1998, 2007; Zimmerman & Schunk, 1989, 2001). These differences in theory and research methods formed the basis for numerous symposia that we organized at professional meetings as well. Through these and many other shared events, Dale's wisdom and friendship has been a constant source of inspiration for me.

Research on Self-Regulation of Learning

JAA: How did you develop an interest in self-regulation of learning?

Zimmerman: When I transitioned to junior high school in the seventh grade, I remember vividly realizing that the carefree days of elementary school were over. Junior high schools were structured like high schools (e.g., rotating classes, school dances, athletic teams that played against other cities), and I knew that I would need to develop strong learning skills to be competitive. As with high school students, the names of junior high students on the school honor roll and high honor roll were published in the local newspaper. Membership on the high honor roll required nearly straight *A*s, and I realized that this level of scholarship would require intensive studying on my part. I decided to take notes from lectures in class and from assigned readings, and I memorized key information from those notes as I prepared for exams. These academic self-regulation strategies worked well, and their success led me to use similar methods to develop skills in other content areas, such as music (in the band) and sports (such as baseball). I practiced diligently and was usually able to figure out the underlying strategy or technique that led to success in that area of skill. Self-regulation meant discerning the shortcomings in my initial approach, discerning a way to address them strategically, and exerting the effort necessary to succeed. I was confident that this SRL process would be as effective in other areas of skill as it had been in academic areas.

JAA: To me, one of the most impressive legacies of Bandura is his work on self-regulation of learning. How has Bandura's theory influenced your work on self-regulation?

Zimmerman: Bandura's research and theory on self-regulation started initially with his studies of modeling influences on students' self-reinforcement practices. In one study, he demonstrated that observers readily adopted the self-reinforcement standards of models (Bandura & Kupers, 1964). In another study,

he showed that models who put off immediate rewards for larger delayed ones significantly increased observing children's willingness to delay their own gratification (Bandura & Mischel, 1965). These studies revealed that social models could induce students to change their self-reinforcement standards when learning on their own. In 1977, Bandura discussed self-regulatory functions in terms of self-antecedents of self-regulation (e.g., environmental planning) as well as self-consequences of it (self-administered rewards). He (Bandura, 1986) subsequently advanced a three-element model of self-regulation involving self-observation, judgment, and self-reactions; to self-regulate, students need to observe some aspect of their performance, to judge those observations according to a standard, and to self-react to those judgments—hopefully in a positive way. In 2000, I developed a model of self-regulation that incorporated these three elements from Bandura's 1986 model along with other closely related variables.

JAA: You developed a model of self-fulfilling cycles of academic self-regulation. Could you please describe the cyclical model?

Zimmerman: My formulation involved three sequential phases: forethought, performance, and self-reflection. The *forethought phase* refers to learning processes and sources of motivation that precede efforts to learn and influence students' preparation and willingness to self-regulate their learning, such as task analysis and self-efficacy. The *performance phase* involves processes that occur during learning and affect concentration and performance, such as strategy use and metacognitive monitoring. The *self-reflection phase* involves processes that follow learning efforts but influence learners' reactions to that experience, such as their self-evaluative standards for learning and their feelings of satisfaction. These self-reflections, in turn, influence students' forethought regarding subsequent learning efforts—thus completing the self-regulatory cycle. This cyclical phase model incorporated Bandura's (1986) three self-regulatory elements in the following way: Self-observation fell into the performance phase whereas self-judgment and self-reactions were placed within

the self-reflection phase. Self-efficacy beliefs were an important source of motivation to self-regulate, and this led me to include this variable among other forethought phase variables. My colleagues and I have validated this cyclical phase model using learning tasks in diverse fields, such as athletics, health, music, and academics.

This multiphase model of SRL was developed for three reasons. First, I wanted to study self-regulatory processes as they are used before, during, and after learning. By measuring students' actual use of these processes during real learning episodes, my colleagues and I sought to draw valid inferences about their causal role—unlike questionnaire measures that rely on the accuracy of students' recall. Inaccuracy can be a serious problem because at-risk students frequently overestimate their self-regulatory functioning, a problem called low calibration (Zimmerman, Moylan, Hudesman, White, & Flugman, 2008). We also found that expert learners are less optimistic but more accurate in their calibration than novices. A second purpose of this multiphase model is to improve the effectiveness of SRL interventions because it links together processes that precede, guide, and follow students' efforts to learn. These interventions can target specific SRL processes in each phase, such as helping students set challenging goals for themselves during the forethought phase, self-recording their progress in attaining those goals during the performance phase, and attributing causality to these goals during the self-reflection phase. In support of this model, we have found that students' learning can break down in one or more phases. For example, the academic performance of an at-risk middle school student improved due to self-regulatory training (Cleary & Zimmerman, 2004). Despite clear evidence of personal success, this student failed to continue to use these self-regulatory techniques because of faulty causal attributions, but this problem was corrected through self-reflection phase training. A third purpose for this multiphase model is to explain the interrelation of key sources of motivation with specific metacognitive processes. By definition, students' proactive use of SRL processes requires personal initiative, anticipation, effort, and

persistence. These motivational requirements have been linked empirically to specific motivational beliefs, such as self-efficacy perceptions, outcome expectations, interest/values, and goal orientations. In support of this multiphase model, there is extensive evidence of significant interrelations between students' metacognitive processes and these sources of motivation. When these motivational variables are considered during cyclical efforts to learn, they enable this multiphase model to explain students' proactive development of self-enhancing cycles of learning.

JAA: You developed a comprehensive structured interview for assessing students' use of self-regulated learning strategies. What is unique about the structured interview? What have you found?

Zimmerman: The Self-Regulated Learning Interview Scale was the first measure of self-regulated learning that we developed (Zimmerman & Martinez-Pons, 1986, 1988, 1990). My colleague and I wanted to see if a variety of SRL strategies would be reported if we asked students to describe how they handled a number of academic tasks, such as preparing for a test, writing a paper, or motivating oneself to study. We were delighted to discover that the SRL strategy measures could distinguish students in a high academic track from those in a regular academic track. These interview measures of SRL formed a unitary factor that was predictive of teacher ratings of these students' SRL in class. We also showed that students attending a school for the gifted displayed significantly higher levels of SRL strategy use than that of students attending a regular school.

JAA: You have done intervention research with inner-city college students in New York. Please describe the intervention and its outcomes.

Zimmerman: My colleagues and I have recently completed an intervention study with at-risk technical college students in developmental and introductory math (Zimmerman et al., 2008). The teachers were taught to model the use of strategies to solve math problems. We discerned that these students were

poorly calibrated, and they overestimated their success in solving math problems. We asked the teachers to have students report their self-judgments of accuracy before and after solving problems on math quizzes. Students who overestimated their accuracy scored more poorly on periodic math exams than students who were accurate in their judgments. We also found that poorly calibrated students interpreted low grades as signs of personal imperfection rather than as sources of information to guide their future learning. To modify this viewpoint, we gave students a self-reflection form to use with math problems that they had answered incorrectly on a quiz. The form asked the students to correct errors in their answer and solve a new problem. The students who used the form were able to regain points they had lost on the quiz. We found that students who used the self-reflection form were significantly better calibrated and scored significantly higher on periodic exams and a final departmental exam than students who did not use the form.

In your dissertation with at-risk technical college students from the same institution, Héfer, we found support for the cyclical model of self-regulation. Specifically, a path analysis tested a self-regulated model of homework completion. We found that students who successfully completed their homework assignments were highly self-efficacious, were highly interested in completing the homework, delayed gratification for the sake of long-term academic goals, reported higher outcome expectancy, and obtained higher grades than students who did not successfully complete their homework assignments (Bembenutty, 2005).

JAA: You have conducted research on self-regulation in the area of sports. What have you found?

Zimmerman: Learning to become a successful athlete requires countless hours of self-directed practice as well as expert coaching. One of the key issues that my colleagues and I studied was the types of goals that athletes set for themselves to guide their practice sessions (Zimmerman & Kitsantas, 1996, 1997). We studied differences between process and outcome goals. It

was hypothesized that learners who focused on implementing a modeled strategy would learn more effectively than students who focused on learning outcomes. We found research support for this hypothesis in our studies of dart throwing. We felt that outcome goals had a role to play as well but only after a process goal becomes automatic. It was discovered that athletes who shifted from process to outcome goals at automation learned more effectively than students who adhered to only process goals. We also conducted expert-novice studies of the influence of other SRL variables in the cyclical phase model besides goal setting. We found that expert athletes performed better than nonexpert and novice athletes on virtually all measures of SRL when practicing basketball free-throw shooting and volleyball serving (Cleary & Zimmerman, 2001; Kitsantas & Zimmerman, 2002). Finally, we taught novice basketball free-throw shooters how to set forethought phase process goals, to self-record during the performance phase, and to make strategy attributions during the self-reflection phase (Cleary, Zimmerman, & Keating, 2006). Students who received three-phase training learned better than students given two-phase or one-phase SRL training.

JAA: You have done research on self-regulation and health. What have you found?

Zimmerman: Most of my research on health issues focused on families' self-regulation of children's asthma (Zimmerman, Bonner, Evans, & Mellins, 1999). Asthma is a major source of absenteeism in school. Although a chronic disease that can be controlled using various types of medicines, noncompliance in medicine consumption is a major problem. The focus of our asthma research was young children whose ability to self-regulate their medications was very limited. To overcome this shortcoming, we taught their mothers asthma regulatory techniques with the assumption that the children would eventually be able to assume self-regulatory control through vicarious learning from their mothers. More specifically, we taught the mothers how to measure the quality of their child's lung functioning using a spe-

cial meter, to graph those results, and to modify the child's drug regimen based on the meter readings.

Many of these mothers, who were drawn from low-income minority groups, did not return to the hospital for further asthma training after the initial session. We discovered several reasons that undermined their willingness to return. Some mothers did not accept the physicians' diagnosis and instead treated asthma as an acute rather than as a chronic disease. They usually attempted to avoid recurrent symptoms by restricting the child's activities instead of using medications. We classified these phase one mothers as being in a *symptom avoidance phase* whereas mothers who accepted the diagnosis were classified as being in an *asthma acceptance phase*. However, many of these phase two mothers did not trust the effectiveness of the prescribed drug regimens, and they too did not return for further training. We classified mothers who did view the drug regimens as effective as being in a third *asthma compliance phase*. However, many compliant mothers were not confident that they could adjust their child's medication in response to changes in symptom patterns. Mothers who felt self-efficacious about managing those changes were classified in a fourth phase, *asthma self-regulation.* We used this four-phase model to plan educational interventions for the mothers, and we did not attempt to teach self-regulation procedures until a mother reached level three. With mothers in phases one–three, we focused on correcting their erroneous underlying beliefs.

Our research showed that this phase model of self-regulation training was valid in the sequential ordering of the phases. We also discovered greater attendance at the follow-up asthma education sessions by mothers receiving phase-specific instructional modules. In support of the model, we found that the mothers' asthma self-regulation phase was negatively related to the frequency of asthma symptoms displayed by her child (e.g., wheezing days, hospitalizations, school absentees). We also conducted an intervention training study and found that children of mothers who made the greatest phase growth displayed the greatest drop in asthma symptoms.

This model was also validated in our research on another disease—sleep apnea (Peach, Jelic, Zhong, Basner, & Zimmerman, 2004). My colleagues and I have also conducted research showing the effectiveness of self-regulatory goal setting and self-recording in increasing student's consumption of dietary fiber (Schnoll & Zimmerman, 2001).

JAA: What is your take on the emergence of multiple theories of SRL? Are they advancing the field's understanding of self-regulation?

Zimmerman: When my colleagues and I began our program of social cognitive research on SRL, we sought to broaden the scope of our thinking by connecting with researchers who were interested in SRL variables emphasized by other theoretical perspectives. For example, phenomenological researchers were interested in self-concept measures, operant researchers were interested in self-reinforcement measures, and Vygotskian researchers were interested in self-instruction measures. Dale Schunk and I decided to provide a forum for these and other theoretical perspectives on SRL to discuss differences as well as points of similarity (Zimmerman & Schunk, 1989). I believe this broad theoretical scope increased the appeal of the topic of SRL to researchers and led to more creative research studies. These research benefits were especially evident in a second edition of our 1989 book in which we asked the authors to reconsider their theories of SRL in light of more than a decade of research (Zimmerman & Schunk, 2001).

JAA: How can a teacher teach students self-regulation of learning?

Zimmerman: My colleagues and I developed a teacher's manual for increasing students' self-regulation of learning as part of normal homework assignments (Zimmerman, Bonner, & Kovach, 1996). The manual focuses on five areas of academic functioning: time planning and management, text comprehension and summarization, classroom note-taking, test anticipation and preparation, and writing skills. Self-regulatory training for each

topic was guided by a cyclical model involving: goal setting and strategic planning, strategy implementation monitoring, strategic outcome monitoring, and self-evaluation.

This instructional model has been applied successfully in recent research in Germany with elementary school children in the fourth grade (Stoeger & Ziegler, 2008). These young students performed better on a major school exam than students who did not receive self-regulatory training. Interestingly, the students were greatly benefited by seeing a depiction of the cyclical model of SRL that guided their training.

In your dissertation, Héfer, we applied successfully this instructional model in a program with at-risk technical college students. For 2 weeks, these students recorded their daily homework activities in a homework log. They reported their math homework goals; where, when, and with whom they did the homework; whether there were distractions; and their level of satisfaction with the completed homework. We found that: (a) the students' level of satisfaction with the effectiveness of their study time was positively related to their final course grade and self-efficacy beliefs; (b) the actual time that the student spent studying was significantly related to ratings of math homework completion; (c) intrinsic interest, self-efficacy, and time management accuracy was positively related to homework completion and the midterm exam; (d) setting specific goals was related to the midterm grade; and (e) their frequency of studying alone was positively related to homework completion and intrinsic interest in the course material (Bembenutty, 2005).

JAA: What does the research suggest about the self-regulation of gifted learners?

Zimmerman: As was mentioned earlier regarding our SRL interview, my colleagues and I found that students attending a school for the gifted used SRL strategies more frequently than students attending a regular school (Zimmerman & Martinez-Pons, 1990). Specifically, 45 boys and 45 girls in grades 5, 8, and 11 from schools for academically gifted students and 90 students

in the same grades from regular schools described their uses of 14 self-regulated learning strategies and estimated their verbal and mathematical efficacy. The specific strategies included organizing, transforming, and seeking information; note taking; self-consequating; rehearsing; seeking help from peers and teachers; and reviewing text and notes. Results support a triadic view of self-regulated learning.

One of the most fascinating sources of SRL strategies comes from autobiographical and biographical accounts of gifted writers, athletes, and musicians (Zimmerman, 1998). Perhaps because of their unusual talents, these experts reported very creative methods of personal self-regulation. One of the most humorous practices was that of the writer Victor Hugo who struggled to resist the temptation of tavern life in order to find time to write. Out of sheer desperation, he resorted to retiring to his study and giving his clothing to his valet with strict instructions not to return them until the text he sought to write was placed outside his door! Many acclaimed writers, such as Anthony Trollope and Ernest Hemingway, kept daily diaries of their writing progress and used these records to reward or punish themselves. Professional athletes often report using visual imagery to guide their preparation in diverse sports, such as golf, tennis, and skiing. Famous musicians, such as the concert pianist Alicia De La Rocha, reported using a slow-paced practicing strategy to enhance their fingering technique. Clearly, even gifted individuals struggled to learn and perform at high levels of skill, and this led to their development of extraordinary as well as common methods of SRL.

Current Projects, New Directions, and Legacy

JAA: What line of research are you currently pursuing?

Zimmerman: I am currently involved in the development and use of *microanalytic* research techniques for assessing SRL by

experts as well as for assessing the results of training studies involving novices. This methodology involves assessing individual student's responses to questions at key points before, during, and after learning. Students' answers to open- or closed-ended questions yield both qualitative and quantitative data respectively. The questions are brief and task-specific in order to minimize disruptions in learning, and they are contextually specific in an attempt to increase their validity. There is a growing body of research indicating that microanalytic measures of self-regulation are highly predictive of performance differences between expert, nonexpert, and novice athletes (Cleary & Zimmerman, 2001; Kitsantas & Zimmerman, 2002). Novices in these studies displayed deficiencies in not only the quantity and quality of self-regulatory processes but also in their motivational beliefs. My colleagues and I have used this methodology in a number of studies with athletic tasks. We have not used it widely with academic tasks to date, but we have a number of studies planned to fill in this gap.

JAA: What do you think will be the direction of the research on self-regulation of learning?

Zimmerman: As I discussed in a recent article (Zimmerman, 2008c), I believe that future researchers will make greater use of *event* measures of SRL (i.e., those that occur during learning). I mentioned that there were five new areas where event measures are being used. One area of research involves learning in supportive computerized environments using electronic trace measures of student responses, such as the number of times that the note-taking feature is used during a learning task. A second type of event measure is a think-aloud protocol for learning from computerized sources of information, such as using hyperlinks to access various sources of information on a science topic. A third area of event measures pertains to the use of students' diary accounts of SRL techniques when studying or practicing on their own. A fourth event measure involves direct observations of students' SRL processes in classroom environments. The fifth

event measure concerns our microanalysis of key self-regulatory processes as they occur during each of the three phases of our cyclical model. The advantage of these five event measures is that they enhance researchers' ability to study relations among SRL subprocesses as they occur and change during learning. This detailed level of information is essential for teachers that are seeking to train students to self-regulate their learning processes more effectively.

JAA: How would you like the field of educational psychology to remember you? What do you consider your legacy to be?

Zimmerman: I leave that specific task to others, but speaking more generally, I would wish to be remembered as a person who revered our discipline and sought to instill a curiosity and passion for it in my students and readers.

JAA: Have I forgotten to ask you anything? Would you like to say anything else?

Zimmerman: Looking back at my career, after exploring many options, I feel very fortunate to have found such a personally rewarding field of study. The dedicated individuals who I have come to know, through my research or efforts to write about our field, have proven to be wonderful compatriots on a path of discovery about who we are as learners as well as who we can become. Thanks, Héfer, for asking me such thoughtful questions. You are a promising scholar with a bright future in our profession.

References

Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, NJ: Prentice-Hall.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory.* Englewood Cliffs, NJ: Prentice-Hall.

Bandura, A., & Kupers, C. (1964). Transmission of patterns of self-reinforcement through modeling. *Journal of Abnormal and Social Psychology, 69,* 1–9.

Bandura, A., & Mischel, W. (1965). The influence of models in modifying delay of gratification patterns. *Journal of Personality and Social Psychology, 2,* 698–705.

Bandura, A., & Walters, R. H. (1963). *Social learning and personality development*. New York: Holt, Rinehart & Winston.

Bembenutty, H. (2005). Predicting homework completion and academic achievement: The role of motivational beliefs and self-regulatory processes. *Dissertation Abstracts International, 65,* 4459. (UMI No. 3159198)

Cleary, T., & Zimmerman, B. J. (2001). Self-regulation differences during athletic practice by experts, non-experts, and novices. *Journal of Applied Sport Psychology, 13,* 61–82.

Cleary, T. J., & Zimmerman, B. J. (2004). Self-regulation empowerment program: A school-based program to enhance self-regulated and self-motivated cycles of student learning. *Psychology in the Schools, 41,* 537–550.

Cleary, T. J., Zimmerman, B. J., & Keating, T. (2006). Training physical education students to self-regulate during basketball free-throw practice. *Research Quarterly for Exercise and Sport, 77,* 251–262.

Kitsantas, A., & Zimmerman, B. J. (2002). Comparing self-regulatory processes among novice, non-expert, and expert volleyball players: A microanalytic study. *Journal of Applied Sport Psychology, 14,* 91–105.

Peach, R. F., Jelic, S., Zhong, X., Basner, R. C., & Zimmerman, B. J. (2004). Ethnicity, self-regulation, and barriers to CPAP use in obstructive sleep apnea (OSA). *Sleep, 27* (Abstract Supplement), A223.

Rosenthal, T. L., & Zimmerman, B. J. (1978). *Social learning and cognition.* New York: Academic Press.

Rosenthal, T. L., Zimmerman, B. J., & Durning, K. (1971). Observationally-induced changes in children's interrogative classes. In A. Bandura (Ed.), *Psychological modeling-conflicting theories* (pp. 188–202). Chicago: Aldine/Atherton.

Schnoll, R., & Zimmerman, B. J. (2001). Self-regulation training enhances dietary self-efficacy and dietary fiber consumption. *Journal of the American Dietetic Association, 101,* 1006–1011.

Schunk, D. H., & Zimmerman, B. J. (Eds.). (1994). *Self-regulation of learning and performance: Issues and educational applications*. Hillsdale, NJ: Lawrence Erlbaum and Associates.

Schunk, D. H., & Zimmerman, B. J. (Eds.). (1998). *Self-regulated learning: From teaching to self-reflective practice*. New York: Guilford Press.

Schunk, D. H., & Zimmerman, B. J. (Eds.). (2007). *Motivation and self-regulated learning: Theory, research, and applications*. Mahwah, NJ: Lawrence Erlbaum and Associates.

Stoeger, H., & Ziegler, A. (2008). Evaluation of a classroom based training to improve self-regulation in time management tasks during homework activities with fourth graders. *Metacognition and Learning, 3,* 207–230.

Zimmerman, B. J. (1996). Enhancing student academic and health functioning: A self-regulatory perspective. *School Psychology Quarterly, 11,* 47–66.

Zimmerman, B. J. (1998). Academic studying and the development of personal skill: A self-regulatory perspective. *Educational Psychologist, 33,* 73–86.

Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 13–39). San Diego, CA: Academic Press.

Zimmerman, B. J. (2008a). Albert Bandura. In E. Donsbach (Ed.), *The international encyclopedia of communication* (Vol. 2, pp. 306–308). Oxford, England: Wiley-Blackwell.

Zimmerman, B. J. (2008b). A teacher's son: The learning-instruction process up close and personal. In F. Pajares & T. Urdan (Eds.), *Adolescence and education: Vol. 4. The ones we remember: Scholars reflect on teachers who made a difference* (pp. 161–170). Charlotte, NC: Information Age.

Zimmerman, B. J. (2008c). Investigating self-regulation and motivation: Historical background, methodological developments, and future prospects. *American Educational Research Journal, 45,* 166–183.

Zimmerman, B. J., & Bandura, A. (1994). Impact of self-regulatory influences on writing course attainment. *American Educational Research Journal, 31,* 845–862.

Zimmerman, B. J., Bandura, A., & Martinez-Pons, M. (1992). Self-motivation for academic attainment: The role of self-efficacy

beliefs and personal goal setting. *American Educational Research Journal, 29,* 663–676.

Zimmerman, B. J., Bonner, S., Evans, D., & Mellins, R. (1999). Self-regulating childhood asthma: A developmental model of family change. *Health Education & Behavior, 26,* 53–69.

Zimmerman, B. J., Bonner, S., & Kovach, R. (1996*). Developing self-regulated learners: Beyond achievement to self-efficacy*. Washington, DC: American Psychological Association.

Zimmerman, B. J., & Kitsantas, A. (1996). Self-regulated learning of a motoric skill: The role of goal setting and self-monitoring. *Journal of Applied Sport Psychology, 8,* 69–84.

Zimmerman, B. J., & Kitsantas, A. (1997). Developmental phases in self-regulation: Shifting from process to outcome goals. *Journal of Educational Psychology, 89,* 29–36.

Zimmerman, B. J., & Martinez-Pons, M. (1986). Development of a structured interview for assessing student use of self-regulated learning strategies. *American Educational Research Journal, 23,* 614–628.

Zimmerman, B. J., & Martinez-Pons, M. (1988). Construct validation of a strategy model of student self-regulated learning. *Journal of Educational Psychology, 80,* 284–290.

Zimmerman, B. J., & Martinez-Pons, M. (1990). Student differences in self-regulated learning: Relating grade, sex, and giftedness to self efficacy and strategy use. *Journal of Educational Psychology, 82,* 51–59.

Zimmerman, B. J., Moylan, A., Hudesman, J., White, N., & Flugman, B. (2008). *Enhancing self-reflection and mathematics achievement of at-risk students at an urban technical college: A self-regulated learning intervention. A final report submitted to the Institute of Education Sciences*. U.S. Department of Education, through Grant R305H060018 to the City University of New York.

Zimmerman, B. J., & Schunk, D. H. (Eds.). (1989). *Self-regulated learning and academic achievement: Theory, research, and practice*. New York: Springer.

Zimmerman, B. J., & Schunk, D. H. (Eds.). (2001). *Self-regulated learning and academic achievement: Theoretical perspectives* (2nd ed.) Mahwah, NJ: Lawrence Erlbaum and Associates.

Zimmerman, B. J., & Schunk, D. H. (2002). Albert Bandura: The man and his contributions to educational psychology. In B. J. Zimmerman & D. H. Schunk (Eds.), *Educational psychology: A*

century of contributions (pp. 431–457). Mahwah, NJ: Lawrence Erlbaum and Associates.

Editor's Note

Barry J. Zimmerman is a Distinguished Professor of Educational Psychology and Head of Learning, Development, and Instruction area at the Graduate School and University Center of the City University of New York. He served as President of Division 15 of the American Psychological Association (Educational Psychology). He has received the Senior Scientist Award of American Psychological Association Division 16 (School Psychology) and the Sylvia Scribner Award of the American Educational Research Association for exemplary research in learning and instruction. He has received grants from the U.S. Department of Education and the Institute for Educational Science to carry out instructional interventions to enhance academic self-regulation by at-risk students. He has also conducted research on families' self-regulation of children's asthma funded by grants from the U.S. Institutes of Health. He received the New York City Department of Health Award for preventive care of childhood asthma and was elected Chair of the Behavioral Science Assembly of the American Thoracic Association and a council member of the American Lung Association.