Self-Regulation Support Offered by Developmental Educators Author(s): Dawn B. Young and Kathryn Ley Source: *Journal of Developmental Education*, Vol. 27, No. 2 (Winter 2003), pp. 2-4, 6, 8, 10 Published by: National Center for Developmental Education, Appalachian State University Stable URL: http://www.jstor.org/stable/42775799 Accessed: 08-08-2017 12:58 UTC

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Self-Regulation Support Offered by Developmental Educators

By Dawn B. Young and Kathryn Ley

There had been little research into what experienced developmental instructors do to support self-regulation.

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ABSTRACT: Poor self-regulation may partially explain developmental student academic achievement because self-regulated learning has been consistently related to achievement in learners across age and educational groups (Lan, 1998; Ley & Young, 1998; Zimmerman & Martinez-Pons, 1990). Underprepared college students who have enrolled in college developmental courses may require more external support from the learning environment. By observing two master developmental educators in the classroom for an entire semester we have sought to answer the question, "what is the experienced developmental educator doing to foster self-regulation in the poorly self-regulated student?" Results demonstrate that the developmental education classroom, although rich with instructional interactions, has provided self-regulation support only on a selective basis. Explanations regarding the lack of prevalent self-regulation support and recommendations as to how it may be provided are included.

The instructional challenge presented by developmental students pervades postsecondary education. About one third of students who enter are academically underprepared for postsecondary education and lack the requisite skills (Burd, 1996; Morrissey, 1994). The National Center for Education Statistics (NCES) reports that 32% of all freshman in 4-year colleges and universities and 41% of community college freshman will require some form of remediation (NCES, 2001). Approximately threefourths of the higher education institutions that enroll freshman offered at least one remedial or developmental reading, writing, or mathematics course (U.S. Department of Education, 1996). Furthermore, many of these students enter the college classroom without the self-regulatory skills required to be successful (Ley & Young, 1998). Unlike self-regulated learners who continually plan, organize, monitor, and evaluate their learning processes (Corno, 1989; Hagen & Weinstein, 1995), underprepared college students may require more external support from the learning environment. Instructional programs have been developed to embed (Ley & Young, 2001) or enhance (Butler, 1998) self-regulation behaviors in poorly self-regulating learners; however, there has been little research into what experienced developmental instructors do to support self-regulation. The purpose of this observational study is to answer the question, "what is the experienced developmental educator doing to foster self-regulation in the poorly self-regulated student?" In this investigation, we have sought to discover whether developmental educators are loaning their students instructional crutches or creating learning toolboxes for them.

Self-Regulation and Academic Achievement

Poor self-regulation may partially explain low academic achievement because self-regulated learning (SRL) has been consistently related to performance levels in learners across age and educational groups. In one study 93% of 80 high school participants were correctly classified into preassigned high/low achievement tracks based on strategy-use indicators (Zimmerman & Martinez-Pons, 1986). Researchers classified strategy use reported by students in response to an SRL interview protocol into one of 14 categories (see Table 1, p. 4). In a subsequent study, 5th-, 8th-, and 11th-grade students who were classified as gifted reported significantly greater use of self-regulated learning strategies than did students classified as regular achieving (Zimmerman & Martinez-Pons, 1990). In the few empirical studies involving SR and underprepared or at-risk college students, researchers found that students with academic or learning deficiencies were more likely to also have SRL deficiencies (Butler, 1998; Corno & Randi, 1999; Ley & Young, 1998).

For cases in which a student is already exhibiting self-regulation, these processes can be enhanced to better support learning, motivation, and performance (Pintrich, 1995). Preservice teachers enrolled in education courses have benefited from instruction supporting self-regulated learning strategies such as cognitive skill instruction, effort reinforcement, and metacognitive skill use (Schutz, Lanehart, & White, 1995). In addition, metacognitive strategy instruction embedded in content instruction in college courses has improved student achievement (Ley & Young, 2002; Nist, Simpson, Olejnik, & Mealy, 1991). Structuring regulatory strategies within instruction has improved achievement in college statistics students (Lan, 1998). College students with

learning disabilities have shown consistent improvements across time when provided with strategic-content learning that promoted SRL (Butler, 1998). The evidence from intervention studies, specifically focusing on college students, on one or more of the SRL processes suggests that instruction which supports self-regulation improves learning outcomes.

Instructional Support for SR

Better learners employ some of the strategies associated with SRL to compensate for cognitive deficiencies (DiVesta & Moreno, 1993), and supportive SRL activities may be increased through instruction to compensate for weak SRL activities (Ley & Young, 2001). For learners who are less self-regulated, the instructional environment may compensate for poor SRL skills with external SR support interventions. Instruction that includes lower achieving learners in the target population may be able to improve learning outcomes if the design promotes compensatory SRL strategies (Ley & Young, 2002; Nist, Simpson, Olejnik, & Mealy, 1991). Hence, academically at-risk students, including college students, lack self-regulatory skills for which SR support may compensate.

Several studies have investigated SRL instructional interventions (Hattie, Biggs, & Purdie, 1996; Lan, 1998; Ley & Young, 2002; Young, 1996); SRL models for instruction (Schunk & Zimmerman, 1998); and cognitive SRL models based upon the expert, highly selfregulating learner (cf., Winne, 1995). However, few have analyzed what teachers, especially those who teach students more likely to be poor selfregulators, do to support self-regulation. Effective teachers exhibit characteristics that include knowledge of the subject matter, care and concern about student's academic growth, ability to communicate well, ability to motivate students, and enjoyment of teaching (Baiocco & DeWaters, 1999; Beidler, 1997; Lowman, 1996; Strube, 1991). Further, leaders in the field of developmental education suggest that teaching developmental education courses requires more than subject knowledge; it requires knowledge of developmental students and how they learn (Boylan, 1999; Kiemig, 1983; Roueche & Roueche, 1993). These teachers have to provide holistic instruction, and they must attend to the cognitive and affective development of the student (Casazza & Silverman, 1996). The question becomes, how do developmental educators support self-regulatory learning in their classrooms?

Method

Because the classroom is a complex environment, rich with a variety of interactions to support learning, we used a qualitative research methodology to identify the values, expectations, and behaviors that occurred in two developmen-

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tal classes. Qualitative research methods for studying complex organizations and processes stem from five principles inherent to qualitative research: (a) a search for understanding, (b) investigator proximity, (c) inductive analysis, (d) familiarity with the setting and phenomena under investigation and, (e) appreciation of the value laden nature of the inquiry (Crowson, 1987). Specifically each of us observed a developmental class for a semester following the observational definition offered by Marshall and Rossman (1995). Observation is the systematic noting and recording of events, behaviors, and artifacts in a setting chosen because of that specific setting. The observer makes no effort to have a special role and is to "be tolerated as a participant" (Marshall & Rossman, 1995, p. 79).

The observations were conducted at two different open-admissions institutions in the southeastern United States. The larger of the two was a 6,500-student residential university, and the smaller was a 4,500-student suburban community college. Both schools placed students in

Researchers found that students with academic or learning deficiencies were more likely to also have SRL deficiencies.

developmental courses based upon an ACT cut off score of 17 or below. The community college offered a study skills course, whereas the university did not. Students were required to take the college study skills course if they had been placed in two or more developmental education courses, most frequently mathematics and English.

Guidelines for Field Observation

Anticipation. In preparation for conducting an observational study, we reviewed published materials on qualitative research. Because of the time-consuming nature of observational studies, the researchers gathered tools and instruments that would be helpful during the course of the project. We put together a notebook for documenting classroom observations and discussed what should be recorded in the classroom. Each investigator obtained a tape recorder in anticipation of such a device being allowed in the classroom. Finally, a checklist of the 14 self-regulatory activities identified and validated by Zimmerman and Martinez-Pons (1986) that included the definitions of each of the self-regulatory strategies was created for both researchers to use as an in-class reference (see Table 1, p. 4).

A research design was created based upon a review of qualitative research methodology. This design was submitted to the research review committee at each institution, and permission was obtained. Once approval was granted, the appropriate administrator of developmental education at each of the sites was contacted. We explained the purpose of the research: to observe instructors' support for self-regulation in the classroom and not to evaluate the instruction provided. We each asked to observe a developmental class that was taught by a faculty member who the administrator considered a master developmental education teacher. We provided no input as to what that definition might include nor what the content of the course was. Independently, each administrator identified a faculty member who had been teaching in higher education more than 5 years, had experience in K-12, and had been identified by students as being a good teacher. Both faculty identified were tenured associate professors and had been teaching for their respective administrators for at least 3 years.

Each of the instructors had excellent ratings of their classroom instruction based upon the observational evaluations by their supervisors. The community college administrator selected a study skills instructor who had been teaching for over 15 years, the majority at the middle school level. She had a graduate degree in counseling and had been teaching at the community college for more than 6 years. At the university, the administrator selected a mathematics instructor. He had a masters degree in mathematics and a doctorate in developmental education, had been teaching developmental mathematics at the university for more than 5 years, and previously had taught high school mathematics. Both teachers exhibited characteristics associated with effective teachers, such as in-depth knowledge about their subject, a concern for students, rigorous academic standards, and positive relationships with students (Baiocco & DeWaters, 1999; Beidler, 1997; Lowman, 1996; Strube, 1991). Further, these two instructors used principles (Smittle, 2003) associated with effective developmental teaching.

We were initially concerned about the effect of different content areas on the research study. However, it was concluded that there would be distinct advantages to analyzing two different content areas. It was far more important that we observe master teachers supporting self-regulation, irrespective of content. Furthermore, this approach would allow comparison of the variances in quality and kind of support offered dependent on content. We also considered that, given the fact that the mathematics course was the course most frequently required by developmental students at the university and that placement in the study skills course was dependent upon placement into two or more developmental courses at the community college, we would be observing courses for which the developmental students were in the most dire need of self-regulatory support.

First visit. The administrator arranged for a meeting between the researcher and the faculty member to be observed. During the initial meeting the researcher explained to the faculty member that we were observing what faculty did to help students and that our observations would be confidential. We reiterated that we were not evaluating faculty teaching. The instructors were informed that we could only be observers and not participants in the class. We would take notes during class, and the faculty member was allowed to review the notes at any time. Each instructor taught at least four sections of the same course during the semester, and we therefore selected a course session that the researcher could attend and which the instructor approved. We did insist that the times be similar. For example, both courses had to be morning, or afternoon or evening to control for time of day differences. The mathematics instructor (MI) selected a morning class that met two times a week, and the study skills instructor (SSI) selected a morning class which met three times a week, each for 150 minutes a week. We obtained a copy of the textbook and syllabus for each course. Finally, the instructors reviewed and signed an informed consent agreement.

Further preparation for observation. Following the meetings with the administrator and the faculty member, we met to codify an observational procedure. Because both instructors were uncomfortable with a tape recorder in their class, we recorded our observations in a notebook. The observations would include all teacher activities and interactions with students. The observational log was maintained by each researcher for primary source data. Researchers met weekly to discuss problems, findings, and revelations. Because of scheduling differences between the two institutions the study skills course met twice before the mathematics course met. This allowed the study skills class observer to inform the other observer of potential complications prior to her attending a class. Some of the complications included the hectic pace of the classroom during the first several meetings and researcher tendency to record instructional methods and content rather than the self-regulatory strategies. If the class was not meeting or meeting in an alternative location (i.e., resource center or computer lab) we decided not to attend class on that day since the activities were outside of the normal range of classroom activities. On the first day of class the instructor introduced the researcher to the class and told his or her students that their purpose was to observe the faculty member. The instructor re-

Table 1

Self-Regulation Category Definitions

- 1. Self evaluation-student-initiated evaluations on the quality of completed work
- 2. Organizing and transforming-overt or covert rearrangement of instructional materials to improve learning
- 3. Goal setting and planning-studentidentified desirable educational outcomes or subgoals and planning for sequencing, timing, and completing activities related to goals
- 4. Seeking information—student-initiated efforts to secure further task information from nonsocial sources when undertaking an assignment
- 5. Keeping records and monitoring-student-initiated efforts to record events and results
- 6. Environmental structuring-studentinitiated efforts to select or arrange the physical setting to make learning easier
- Self-consequences-student arrangement of rewards or punishment for success or failure
- 8. Rehearsing and memorization-student-initiated efforts to memorize material from overt or covert practice
- Seeking assistance from experts/ teachers-student-initiated efforts to solicit help from experts or faculty
- **10. Seeking assistance from peers**—student-initiated efforts to solicit help from other learners
- **11. Reviewing tests**—student-initiated efforts to reread tests to prepare for class or further testing
- **12. Reviewing notes**—student-initiated efforts to reread notes to prepare for class or further testing
- **13. Reviewing texts**—student-initiated efforts to reread books to prepare for class or further testing
- 14. Other-any other strategies, typically not self-regulating

frained from referring to the observer in the classroom for the remainder of the semester.

Further Development of Conceptualization

After 1 week of observation, we met to discuss potential sources of error and any difficulties in recording observations. Each of us acknowledged difficulty determining what was instructional and what was self-regulation support. To solve the problem, we agreed to record instructional events, rather than overlook them, as well as self-regulatory support activities. Instructional events would later be coded as instruction during the analysis phase. Another decision was to have the checklist of strategies (see Table 1) with us during the class as a reference during the observation.

During this early part of the process both instructors developed cold feet regarding the observation. The pressure of having an external observer present during their entire class was more stressful than either had anticipated. Both instructors were given the opportunity to review the notes of the researchers and offered the opportunity to withdraw from the study. This was discussed in detail between the faculty member and the researcher but not the administrator, since each administrator might unduly pressure the faculty member to participate in the research. The instructors were given the observational notebooks and allowed to review them with the researcher. Their questions about the notes were answered and noted in the logbooks. When it became apparent these meetings with the faculty would continue, both researchers wrote questions for the instructors in the logbook. Answers to these questions were recorded into the logs. This level of accessibility reduced faculty anxiety and both were assured that no one would see the observation logs except for the researchers. They were also reminded that each faculty member could review the notes on his or her class at any time. Each agreed to remain in the study.

Gather Data/Validate Data

Our observations continued throughout the fall semester for all regularly scheduled meetings of the class: 29 for the mathematics course and 38 for the study skills course (6 meetings of the study skills course were held in an academic resource center while students worked on an independent project). We reviewed tests, discussed the observations with the faculty member, and asked instructors to clarify the rationale for selected activities. It speaks to the classification of these instructors as master developmental teachers that each asked about and wanted to know what they could do to improve their instruction or their delivery. Although both had expressed concern about the presence of the researchers initially, they were anxious to glean information from the research about how they might improve their courses. It was constantly reiterated that we were not observing their instruction, but their interactions, and could not reveal precisely what had been observed because it would change the nature of the observations.

Analysis of Data

We entered our notes into a database with each event assigned to a single record in the database. We used 14 strategies from a self-regulation interview schedule (Zimmerman & *continued on page 6*)

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Martinez-Pons, 1986) and added three additional categories for comments and methods that were related to direct instruction, classroom management, or self-efficacy support. For example, if the instructor reviewed test answers with students, then it was coded as review tests. A self-efficacy support category was added to capture this important self-regulation factor. The two nonself-regulatory categories, classroom management and direct instruction, captured instructor behaviors that did not support selfregulation but were the bulk of instructor activity. We each coded every record from both courses into one of 14 self-regulatory categories and then compared our respective codings. Each observation was coded by both researchers. We reconciled the few coding discrepancies between the 758 records by discussing the rationale for the coding, that is, asking what was happening in the class at the time.

Results

The total number of recorded interactions was 758; 406 from the mathematics class and 352 from the study skills course. The study skills course did not meet in class for 2 weeks (6 class days) because the students were working on an independent note-taking project. No observations were conducted during this time. One hundred and fifty of the 758 events from both classes supported self-regulation. The mathematics instructor (MI) made 62 of the self-regulation comments and the study-skills instructor (SSI) made 88. The MI reinforced self-efficacy throughout the semester and did so more frequently than the SSI did (see Figure 1). The MI repeatedly alluded to his confidence in students' ability with comments such as "I know you can do these [problems]" and "I know you can do this." The SSI emphasized monitoring about twice as often as the MI. Some of the SSI's comments/actions included giving the students a monitoring sheet on which to record their study times, referring students to the class schedule, and asking them to use the monitoring tools in the text. The MI distributed an assignment calendar and occasionally would refer to the assignment for the next class or an upcoming quiz.

SSI supported organizing and transforming information far more often than the MI (see Figure 1). For example, the SSI suggested that the students get a folder to organize materials and told them how to prepare for an open book test. She guided students to prioritize their study time by items in the text. The MI distributed a study guide and told students to prioritize their study time by the items they missed on the homework. The SSI emphasized goal setting almost twice as often as the MI. Self-evaluation was encouraged on 13 occasions by the MI but only on 3 occasions by the SSI. Neither instructor supported seeking information or using self-consequences. Only the MI on one occasion encouraged rehearsal and practice. Both encouraged seeking help from peers, reviewing texts, and reviewing notes equally. Both instructors encouraged seeking help from teachers.

Only the MI mentioned the self-regulatory strategy of rehearsal and memorizing and then only once. Given the content of the mathematics course, and the importance of memorizing mathematics principles for success in that type of course, it was interesting that the strategy was not used with greater frequency. Instead, the MI depended on direct instruction and referred students to the text. In the study-skills class environmental structuring was mentioned 5 times and not at all in the mathematics class. Four of the self-regulatory activities were not mentioned by either SSI or MI during the entire semester: seeking information, self-consequences, reviewing tests, and other (a collection of ineffective non-SR strategies).

Discussion

The developmental instructors did support self-regulation throughout the class but with limited frequencies in each category. Instructors reinforced student self-evaluation only 13 times in mathematics and 3 times in study skills. Environmental structuring or preparing a study environment was overlooked by the MI and mentioned only 5 times by the SSI. Organizing and transforming was given support on 20 occasions in the study-skills class but only 3 occasions in the mathematics class. Monitoring was the most frequently reinforced skill in the study skills class and the second most in the mathematics class. Both instructors selectively supported self-regulation throughout the class.

Both instructors frequently supported learner self-efficacy. Self-efficacy, or the personal belief about one's ability to learn or perform a skill at required levels (Bandura, 1986), influences cognitive functions (Bandura, 1993) and performance (Pajares & Miller, 1994). The MI supported self-efficacy with greater frequency than did the SSI. It may be particularly important to support math efficacy. Pajares and Miller (1995) have found math efficacy to be significantly related to math performance and a more powerful predictor of successful mathematical problem solving than confidence to perform math-related tasks or confidence to succeed in math-related courses.

Reviewing study findings, we are faced with the typical task of qualitative research: "persuading you that the findings of the inquiry are worth paying attention to, worth taking account of" (Lincoln & Guba, 1985, p. 290). Criteria for the trustworthiness of qualitative research, as described by Lincoln and Guba, include establishing credibility, transferability, dependability, and confirmability.

Credibility

College classrooms are complex cultures, and measuring what occurs within them is a complex task that requires a qualitative research approach (Whitt & Kuh, 1991). As to credibility of the research, an independent objective observation of faculty activity would be more credible than faculty self-report of self-regulation support and would limit potential bias. The two observed instructors were both independently identified by their administrators as being master developmental teachers, without benefit of guidance or input from the researchers as to a definition of such. Despite the lack of guidance, the two instructors were very similar in their education

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and teaching experience. The continual questioning by the instructors about how they could improve instruction suggested to both investigators that these were master developmental teachers, continually in the process of improving as master teachers.

To further extend credibility of the data, the meetings between the developmental instructors and the researchers became debriefing sessions. We reassured instructors that there were no ulterior motives for the observations. During the meetings we could clarify instructor rationale for activities. In the weekly meetings between researchers only, we explored ideas that had emerged during the past week, obtained feedback from one another, and discussed future steps and procedures. Notes from all meetings, between faculty and researchers and between researchers, were recorded in the observational logs. Finally, the credibility of this research was evidenced in the tremendous time commitment that was required to complete the observations. Although this may seem like a selfserving measure of credibility, the level of commitment required to complete this undertaking does support its trustworthiness (Lincoln & Guba, 1985). We each had to spend 150 minutes a week observing a class in addition to our own instructional and institutional demands. Further, we had to meet once a week with one another to maintain observer consistency and at least once every other week with the instructor each of us was observing.

Transferability

To establish the transferability of this research, the setting of the current study and the setting to which these results may be applied must be similar (Whitt & Kuh, 1991). Except for their categorization as master teachers by their administrators, there is nothing extraordinary in qualifications of the MI and SSI that set them apart from other educators. At any college or university in the country there are probably a handful of similar developmental educators. This suggests what was observed in these two classrooms is probably very similar to what takes place in countless classrooms. Hence, to apply the study from one setting to another, or to transfer it, should be possible. What may set them apart from other developmental educators is the length of experience both had as classroom teachers. Since we did not observe a less experienced or novice developmental educator, these results may not be transferable to that population of educators. However, in observed classrooms, support for or instruction in self-regulation strategies was spurious, infrequent, and on a selective basis.

Dependability

The research observations over the course of one semester reinforce the dependability of the results. Limiting this study to a single semester eliminated the problems that could have occurred due to a change in course structure, course organization, course description, or course text over multiple semesters. It also limited the possibility that the instructor could have begun to include more self-regulatory support due to an increased awareness of self-regulation obtained through discussions with the researchers. Given instructor requests for information about self-regulation this probably would have been the case: Had this research been extended into a second semester each instructor may have introduced new factors, activities, and students to increase the SR support they provide.

Confirmability

This study is confirmable to the extent that any qualitative observational study is replicable. Observational research can be repeated, but

Observational research can be repeated, but never entirely in the same context by the same researchers.

never entirely in the same context by the same researchers because of changes that occur to all participants (Marshall & Rossman, 1995). We cannot go back and rerun this study because we are not the same researchers that naively entered the classroom as observers and the instructors are no longer the same two people that allowed us to observe them. However, copious notes of the experience exist, and examination of those notes along with the established database could reestablish the research setting to a small degree. Care was taken during the analysis stage to reach complete agreement in the coding, and the inference and conclusions drawn from the data were logical and conservative, based solely on what the data revealed.

Limitations

Providing self-regulatory support, even to the selective extent found in this study, may have been content dependent and, therefore, present a limitation of this study. The focus of the studyskills course was to develop cognitive and metacognitive skills in developmental students. The SSI provided self-regulatory support in greater frequency than the MI in four areas: organizing and transforming, goal setting, recording and monitoring, and environmental structuring. Three of those four activities were identified as deficient in developmental students (Ley & Young, 1998). Three strategies, seeking assistance from peers, reviewing notes, and reviewing texts, were mentioned an equal number of times in each course. The only strategy that the MI mentioned but not the SSI was rehearsal and memorization. However, overall neither faculty member utilized self-regulatory support strategies with great frequency in their course. Future research should examine self-regulatory support in similar content courses but with instructors with different experience levels.

The potential for bias in the coding of the observed events by the observers may present a limitation of this study. Third party coders may have been more objective though not necessarily better able to code the data. Such an approach would have required training a third or fourth party in the coding of the data, explaining the data collected, and revealing the observational data to someone other than the instructors. Further, it would have introduced another variable with potential limitations. Both of the researchers are familiar with coding the Zimmerman and Martinez-Pons (1996) strategies. Researchers have chosen the best course of action-to limit the exposure of the data to additional partiesgiven their experience with this procedure and the concern of the faculty that the observations not be revealed.

Using a research methodology that is unfamiliar, such as qualitative as opposed to quantitative, introduces its own limitations to the study. Although the researchers spent considerable time preparing for this project, it was far more time-consuming than anticipated. Both investigators had to record classroom observations about SR activities, analyze observational data, and constantly reassure instructors of their research purpose.

Recommendations

As a result of this project, we recommend that research continue into the role that self-regulated learning support plays in the developmental classroom, either through qualitative or quantitative measures. There is no clearly defined measure regarding how much self-regulation support is needed to benefit students nor what kind might be most beneficial. Research has shown that there is a significant difference in the use of self-regulated learning strategies of regular-admission and developmental (Ley & Young, 1998) as well as other at-risk college students (Butler, 1998). Hence, students that most need to use self-regulation learning strategies do not have a toolbox of those strategies. The selective classroom use of SR strategies provides only a crutch for poorly self-regulated students in that classroom. SR strategies need to be consistently

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provided by instructors in the classroom, either in the form of direct instruction or embedded into the instruction. We recommend that developmental educators use an instructional model that systematically provides support for SRL, such as proposed by Shin (1998), Butler (1998), or Ley and Young (1998). Research using the Strategias Content Learning model (Butler) has shown that college students with learning disabilities exhibit improved GPAs from self-regulatory support provided on an individual basis, whereas the POME instructional model has demonstrated self-regulatory support embedded into instruction improves developmental student attendance and success (Ley & Young, 2002).

We discovered through this qualitative research protocol that two master developmental educators provided detailed direct instruction and selective support for developmental students' self-regulation. However, the support was not comprehensive and may not have corresponded to developmental students' SR deficiencies. These students, to become successful academically, may require a SR toolbox that they can carry with them, rather than something that will carry them. Remedies for this situation include creating an awareness of the need for selfregulation in developmental students, designing developmental courses by embedding self-regulation into the instruction, and asking developmental educators to monitor their own instructional activities to ensure that they are providing support for self-regulation.

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